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# Determinants of physical activity in middle-aged woman in Isfahan using the health belief model

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## Abstract:

**INTRODUCTION:** Nowadays with respect to the automation of the lifestyle, immobility statistics in middle-aged women has increased and they are at risk for complications of immobility. One of the models used to identify factors associated with physical activity is Health Belief Model utilized in different age and different cultural backgrounds and different results have been obtained from those studies. The purpose of this study was to investigate the factors affecting on physical activity in middle-aged women using Health Belief Model.

**MATERIALS AND METHODS:** This descriptive-correlation study was conducted on 224 middle-aged women referring to health centers in Isfahan. Health Belief Model structures including perceived susceptibility and severity, perceived barriers and benefits, and self-efficacy were measured by questionnaire and physical activity was assessed using the international physical activity questionnaire. Collected data were analyzed using descriptive statistics and Pearson correlation coefficient test and regression analysis.

**RESULTS:** There wasn't significant correlation between perceived susceptibility ( $P = 0.263$ ,  $r = 0.075$ ) and perceived severity with physical activity duration ( $P = 0.127$ ,  $r = 0.058$ ) but there was positive and weak correlation between physical activity duration with perceived benefits ( $P = 0.001$  and  $r = 0.26$ ) and perceived self-efficacy ( $P = 0.001$ ,  $r = 0.54$ ) and had weak and inverse correlation with perceived barriers ( $P = 0.001$ ,  $r = -0.25$ ). Regression analysis also showed that from among all the Health Belief Model structures just self-efficacy structure has influenced on behavior independently and other structures are affected by it.

**CONCLUSION:** The obtained results implied on a correlation between benefits, barriers and perceived self-efficacy with and moderate physical activity. Therefore it is necessary to develop appropriate educational programs with emphasis on structures of Health Belief Model that has the maximum impact on physical activity in middle-aged women.

## Keywords:

Health belief model, Physical activity, middle age, women

## Introduction

According to the World Health Organization report, immobility is 1 of the 10 major causes of death and disability in the world.<sup>[1]</sup> In Iran immobility life has been recognized as a serious problem too.<sup>[2]</sup> Studies show that the prevalence of immobility among the population 22–65 years during the 4 years has increased from 15% (1385) to 21.5% (1390) and the rate of immobility in work, travel and traffic, and recreation and leisure time have been

56.4%, 39.2% and 78.7%, respectively.<sup>[3]</sup> Moreover, evidences show that 70–80% of Iranians do not have enough mobility<sup>[4,5]</sup> that its statistics in Iranian women is far higher than Iranian men.<sup>[6]</sup> In a study conducted in Tehran, 69.8% of the study population was inactive; in other words, only 3.30% of the women were doing physical activity.<sup>[2]</sup> In another study conducted in Isfahan on average, 71.6% of women working at Isfahan University and Isfahan University of Medical Sciences had an immobility life.<sup>[7]</sup> Despite the emphasis of health centers to exercise and physical

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activity, a quarter of women never participate in regular physical activity<sup>[8]</sup> and in Iran 77% of women are inactive.<sup>[2]</sup> Immobility life is associated with the risk of many chronic diseases<sup>[1]</sup> so that yearly 2 million deaths in the world occur due to immobility life.<sup>[9]</sup> In the meantime, midlife often is considered as a sign of reduced health in women and this group compared to younger ages is more susceptible to disease.<sup>[10]</sup> In this course, people encounter with different physiological, physical, cognitive, and social changes and experience the first symptoms of chronic diseases such as hypertension, arthritis, cardiovascular disease, and diabetes in this period and with the occurrence of menopause are susceptible to changes that affect on their health condition.<sup>[11]</sup> And while appropriate physical activity has protective effects against chronic diseases and premature death and several studies have confirmed its benefits.<sup>[12]</sup> Doing physical activity causes the postponement of aging and disability, increased physical stamina, reduced risk of falling in the elderly,<sup>[13]</sup> reduced vasomotor symptoms arising from menopause,<sup>[14]</sup> reduced risk of cardiovascular diseases, diabetes, osteoporosis, cancer, and obesity.<sup>[15-17]</sup>

In this regard, one of the developed goals of the World Health Organization up to 2025 is to promote people's healthy style of life and reduce immobility as much as 10% that based on it all countries should actively put in their agenda strategies that are effective in improving their individual and social life and reduce factors damage to human health.<sup>[1]</sup> Encouraging people to change behavior and choose healthy behavior is a complex process that under the worst conditions is still very difficult.<sup>[18]</sup> Physical activity pattern is affected by environmental, social factors,<sup>[19]</sup> and biological structure of body<sup>[20]</sup> and psychological factors<sup>[21]</sup> that during different periods of life undergoes changes.<sup>[19]</sup> Diversity of various sociocultural fields has made complex the effect of the factors associated with physical activity.<sup>[22]</sup> Since the people's ability level as well as barriers and benefits can be considered as important variables in doing physical activity; hence, health belief pattern can be used as one of the models studying behavior.<sup>[23]</sup> Health belief model tries to explain that why some people utilize health behaviors and some do not do it.<sup>[24]</sup> Based on this pattern adopting health behavior depends on the two subjects: first, person's perceptions of the danger that threatens him; second, person assessment of the barriers and benefits of health action. Perceived threat means that person's feelings are subjected to the disease and so adopts preventive behavior that itself is influenced by two factors: perceived severity and susceptibility. In perceived susceptibility, person knows himself sensitive to a particular disease so in this respect, does measures already and in perceived severity, the person estimates intensity and deterioration of disease

and feels the threat. Person's assessment of the benefits and barriers of healthy behavior is also effective in the probability of doing behavior. The person follows behavior that is feasible, useful, and effective. But, on the other hand, negative and potential aspects of a health behavior also may act as a barrier for adapting a health behavior. The other important structure of this model is self-efficacy that is the result of this subject that the person has the ability to follow a behavior. Self-efficacy is related to the specific behavior and in the present time and is not related to the past or the future.<sup>[23,24]</sup> In several studies, the correlation between health belief model structures and doing behavior has been examined.

Shojaeezadeh *et al.* in their study reported that the mean score of perceived severity and susceptibility of women has been moderate, but their perceived benefits for doing exercise has been too low.<sup>[25]</sup> In other studies, lack of time, lack of social support, feeling laziness, indifference, lack of belief in the benefits of exercise, low self-efficacy, work and academic concerns, and lack of access to sport place have been mentioned as the main perceived barriers for doing exercise.<sup>[26-29]</sup> These studies in different cultural and age fields around the world have been conducted. But still the relationship between this model and physical activity behavior in middle-aged women of Isfahan has not been examined. Accordingly, in the present study, we identified the factors associated with physical activity of middle-aged women in Isfahan-based on health belief model in order to put available its results for planning and necessary measures for health professionals.

## Materials and Methods

This was a descriptive-correlation study conducted for a month (Ordibehesht) on middle-aged women referring to the Health Centers in Isfahan in 1394. The number of samples based on previous studies<sup>[30]</sup> using statistical formula  $n = \frac{Z^2 S^2}{d^2}$  have been calculated at least 200 people. Considering the 20% fall, sample size was considered 240 people (Z: Confidence coefficient 95% and  $d = 0.14 S$ ). In this study, two health networks 1 and 2 of Isfahan were considered as clusters and of the 46 centers affiliated to these two networks eight centers including Khaju, Nawab Safavi, Pol Shahrestan, Rostamian, Feiz, Shahidfadayii, Moataned, and Amir Hamze were randomly selected and for each center 30 samples equally were considered. Then, all the 40–60 years women referring to the centers were interviewed. Criteria for entering the study were Iranian citizenship and residence in Isfahan, lack of any disease and conditions that limit movement and lack of infecting to mental and psychological illness examined through medical history, and according to the patient. Moreover,

exclusion criteria were a lack of completing, at least, one item from each section of the questionnaire and lack of intention to continue during completing questionnaire. All women who had inclusion criteria for the study were invited. Of the 320 people who were eligible for entering the study, 240 people were ready to participate in research. The data were collected through a three-part questionnaire including.

### Field variables questions and demographic section

This section was examined with four questions regarding age, marital status, menopausal status, and education level.

### Questions related to the health belief model structures section

It consisted of perceived barriers of physical activity and perceived benefits of physical activity and perceived severity and susceptibility of immobility that statements of all parts of health belief model measurement were scored based on 5-point Likert scale from 0 for strongly disagree to 4 for strongly agree. And then, resulting score was calculated of 100. In cases that the samples were illiterate, the questionnaires were completed by questioning and in other cases were completed as self-reporting. In order to determine content validity and face validity, after correction and approval by the supervisor and counselor, questionnaires were given to ten faculty members who had sufficient expertise and experience in the field of health education, healthy behaviors and physical activity, and their comments regarding the questionnaire were applied. To determine the reliability of internal consistency of the questionnaire, Cronbach's alpha coefficient was used and the limit higher than the 0/7 was considered acceptable. Then assessment of the reliability of the consistency of the results was performed by test-retest method, and the questionnaire was given to 20 middle-aged women who were eligible for inclusion in the study to be completed; then with an interval of 10–14 days the questionnaires were completed by them again. In this study, the Cronbach's alpha coefficient for each section "perceived severity," "perceived benefits," "perceived barriers," and "self-efficacy" was obtained 0.76, 0.75, 0.78, 0.77, and 0.82, respectively. In addition, the correlation of each mentioned sections was determined 0.77, 0.76, 0.76, 0.72, and 0.73, respectively.

### *Perceived barriers and perceived benefits*

In order to investigate these structures a researcher made questionnaire was used designed according to the results of previous researches and available questionnaires.<sup>[31]</sup> Perceived barriers included eight questions and perceived benefits included nine questions. In section perceived barriers, the middle-aged women's beliefs about the barriers considered as a

deterrent and disruptive factor for adapting physical activity were investigated, including "physical activity makes me tired" and/or "I don't have time for physical activity." And in section perceived benefits, we assessed the attitude of middle-aged women about profits and benefits that they get off physical activity (in individual and social aspects). For example, "physical activity gives me self-confidence" and "physical activity causes to do my daily activities without fatigue."

### *Perceived severity and susceptibility complications of physical inactivity*

These structures were investigated using a researcher made questionnaire designed based on the results of previous studies and available questionnaires. Section perceived severity included five questions and section perceived susceptibility included five questions too. Perceived susceptibility was the perceptions and attitudes of middle-aged women about this matter that how much they feel are exposure to the risk of immobility complications. Items can be studied in this questionnaire are physical and psychological complications resulting from immobility and disorder in individual and social performance, for example, "immobility during menopause is dangerous" and/or "immobility in middle-age threatens my health." And perceived severity assessed the attitude of middle-aged women about injuries and problems can be created as a result of the immobility, for example, "if I'm immobility during middle-age it is possible to infect to a disease" and "I'm immobility during middle-age it is possible to infect to depression and anxiety."

### *Perceived self-efficacy*

Perceived self-efficacy in this study is a degree of middle-aged women's belief in their ability in doing physical activity. This structure was assessed using researcher made questionnaire. This section was examined by seven questions and included items such as "I can do physical activity, even if I'm tired" and "I can do physical activity, even if I feel depression and upset."

### International physical activity questionnaire

The questions assess the physical activity performance in 7 past days.<sup>[32]</sup> Accordingly, measures activities with weak, moderate, and severe intensity. Moderate intensity activities like carrying light loads, average speed cycling or volleyball, and walking and intense activities like aerobics and aerobic exercises, fast cycling, and running meanwhile any activity that its duration is <10 min was eliminated. Then total duration of moderate and intense physical activity was measured in minutes. Since the global standard of intense and moderate physical activity duration is 50 min/week, researchers considered as inactive those who had less intense and moderate physical

activity.<sup>[33]</sup> Reliability and validity of this questionnaire have been confirmed in Kelishadi *et al.* study in 1380.<sup>[34]</sup> Furthermore, questionnaire's correlation coefficient in Vahedian-Shahroodi *et al.* study has been stated 0.86.<sup>[35]</sup> Collected data were analyzed with the help of statistical program SPSS 16 (SPSS Inc.: Chicago, IL) and using descriptive statistics (absolute and relative frequency, mean and standard deviation) and Pearson correlation coefficient test and linear regression and the significant level of data was considered equal to 0.5. It should be noted that ethical issues were considered in the study. Researcher after obtaining official permission from the Nursing and Midwifery Faculty of Isfahan referred to the Province and City Health Center and began his/her research by providing the necessary explanations to the relevant authorities. Also besides explaining the purpose of research, oral and written consent was obtained from all subjects. Then questionnaires were completed at the right place in the health center.

### Findings

After finishing sampling, data were entered into SPSS 16. A total of 224 subjects asked to the questionnaires completely. The mean age of surveyed subjects was  $48.96 \pm 5.84$  years that most were married and housekeeper [Table 1]. Seventy-five percentage of the samples did physical activity less than the standard 150 min/week, and the mean and standard deviation of the duration of moderate and intense physical activity were 137 and 114 min, respectively. The mean score of health belief model structures has been shown in [Table 2]. Calculating Pearson correlation coefficient, there was an inverse relationship between age and duration of intense and moderate physical activity, and also there was a direct relationship between education level and duration of intense and moderate physical activity. Also, there was a positive and weak correlation between physical activity duration and perceived benefits, and there was a positive and strong correlation between moderate intensity between perceived self-efficacy and physical activity behavior and there was a weak and inverse correlation between perceived barriers and physical activity behavior. But there was not significant correlation between perceived susceptibility and severity with physical activity behavior [Table 3]. Moreover, the linear regression analysis between duration of moderate and intense physical activity in terms of health belief model structures with multiple coefficients ( $R^2 = 0.33$ ) showed that there is a significant linear relationship between duration of moderate and intense physical activity and score of health belief model structures ( $P < 0.05$ ). The most correlation was between duration of moderate and intense physical activity and perceived self-efficacy [Table 4].

**Table 1: Distribution of absolute and relative frequency of demographic variables in study subjects**

Demographic variables	Number	Percentage
Marital status		
Married	210	93/8
Single/divorced/widowed	14	6/2
Education level		
Illiterate	14	6/3
Diploma or less	166	74/1
Collegiate	44	19/6
Employment status		
Homemaker	180	80/35
Employed	44	19/65
Menopausal status		
Yes	110	49
No	114	51

**Table 2: The mean (0-100) scores of awareness and structures of the health belief model about middle-age women's physical activity**

Variable	Mean	SD
Perceived severity	99	4/2
Perceived susceptibility	95/2	9/6
Perceived benefits	85/8	13
Perceived barriers	44/56	20/2
Self-efficacy	64/78	23/6

SD = Standard deviation

**Table 3: Evaluation of the association of physical activity with structures of the health belief model in study subjects**

Variable	Physical activity	
	P	r
Perceived severity	0/26	0/075
Perceived susceptibility	0/06	0/1
Perceived benefits	0/001	0/26
Perceived barriers	0/001	-0/25
Self-efficacy	0/001	0/54

**Table 4: Regression analysis of health belief model constructs in predicting physical activity in study subjects**

Variable	Beta	t	B	P
Perceived severity	0/068	1/17	1/8	0/24
Perceived susceptibility	0/013	0/2	0/16	0/82
Perceived benefits	-0/02	-0/25	-0/14	0/8
Perceived barriers	-0/07	-1/1	-0/4	0/27
Self-efficacy	0/52	7/7	2/5	0/001

## Discussion

The purpose of this study was to investigate the factors affecting on physical activity in middle-aged women of Isfahan-based on health belief model. In this study, 75% of samples were inactive and did not do the minimum amount recommended by the World Health

Organization (150 min moderate physical activity per week). Therefore, the results of this study shows that the surveyed subjects do not do necessary physical activity as much as is useful for their health. In other studies conducted in Iran, similar results have been achieved.<sup>[4-6]</sup> Hence, designing educational interventions in order to promote physical activity in middle-aged women seems necessary. In this study, perceived benefits and barriers had direct but weak correlation with duration of physical activity which is consistent with a study conducted by Solimanian *et al.* on middle-aged women in Tehran.<sup>[30]</sup> The results of a study conducted on menopausal women in Texas<sup>[36]</sup> and the study of King *et al.* also support the results of this study indicating that there is a correlation between perceived benefits and barriers with duration of intense and moderate physical activity. In the study of Shin *et al.*, perceived benefits and barriers were as the factors affecting on subject's commitment to participate in sports activities, and perceived barriers had shown a negative correlation with participating in sports activities.<sup>[37]</sup> But in the study of Gharlipour *et al.* conducted on personnel of medical emergencies, there was not significant correlation between perceived benefits and barriers and physical activity.<sup>[38]</sup> Also in the study of Aghamolayi *et al.*, a significant correlation between perceived benefits and doing behavior was not observed.<sup>[39]</sup> It seems that in middle-aged women of Isfahan, benefits and barriers structures perceived of health belief model are effective components for strengthening physical activity. Perhaps we can say that the statements of the present questionnaire which has been used to measure perceived benefits and barriers can examine this structure well by including different dimensions of perceived benefits and barriers of physical activity. But, on the other hand, the important thing is that why despite high mean score of perceived benefits (85.8%) in studied samples, physical activity is undesirable? Accordingly, it seems necessary to do more comprehensive studies with a holistic view and/or identify other relevant and determinant factors in this group. In this study, despite the favorable score in perceived susceptibility and severity (acquisition 95–99%) of the obtainable mean score by perceived susceptibility and severity duration of moderate and intense physical activity and in other words perceived susceptibility and severity were not able to predict behavior. In line with our findings other studies such as the studies of Baghianimoghadam *et al.* which had investigated the role of health beliefs in performing preventive behavior of cardiovascular diseases in people at risk showed that perceived susceptibility and severity are not predicting factors for adopting preventive behavior.<sup>[40]</sup> In Edmonds study in 2009,<sup>[41]</sup> Keating *et al.* in 2005,<sup>[42]</sup> and Solimanian *et al.* in 2014<sup>[30]</sup> there was not statistical significant correlation between perceived severity and behaviors preventing of osteoporosis,

but there was a direct correlation between perceived susceptibility and behavior. In other studies like study of Mazloomi *et al.* there was a direct correlation between perceived susceptibility and behavior preventing of diabetes including physical activity, but it did not have a significant correlation with perceived severity.<sup>[43]</sup> It seems that only understanding the threat and feeling vulnerable against immobility complications are not sufficient for changing or promoting behavior, but since the perceived susceptibility and severity is affected by medical knowledge and information it seems that the reason of difference in the results of different studies, is the difference in awareness level of the risks and disabilities following unhealthy behavior. Given that in various studies, different results from the relationship between perceived susceptibility and severity with physical activity behavior have been obtained, it is needed that still more studies are done in this field to explain the relationship between these two structures with behavior more than ever. One of the other factors examined in this study was perceived self-efficacy which showed a strong association with physical activity that this result is consistent with several studies. For example, a study conducted on Korean middle-aged women in 2006 showed that self-efficacy causes to people are put in the more advanced stages of changing physical activity and have more preparation for change.<sup>[44]</sup> Also in the study of Daniali *et al.*, there was a statistical significant correlation between self-efficacy and physical activity in women working at Isfahan University and Isfahan University of Medical Sciences.<sup>[7]</sup> The results of studies such as Dlugonski and Motl in 2014,<sup>[45]</sup> and Peyman *et al.* in 2013<sup>[46]</sup> and Solimanian *et al.* in 2014<sup>[30]</sup> were consistent with our results. With regard to the results of this study and previous studies, it seems that self-efficacy is one of the important structures in predicting physical activity behavior and strengthening this structure has a high effect on the promotion of physical activity. Accordingly, it is necessary that planners and practitioners, in their short-term and long-term planning, with appropriate methods promote self-efficacy in this group of people.

## Conclusion

The findings of this study showed that surveyed subjects do not need physical activity as much as is useful for health and there is a need to design educational interventions of community health nurse in his/her educational role, to promote level of intense and moderate physical activity in middle-aged women of Isfahan. Default underlying the health belief model about role of perceived susceptibility and severity in increasing probability of behavior incidence was not confirmed. It seems that only risk perception and sense of vulnerability about immobility complications is not sufficient for creating health behavior. In educational

curricula of community health nurse based on the health belief model, emphasis on self-efficacy, perceived susceptibility and severity, and raising it can lead to promotion of physical activity level of middle-aged women in Isfahan. On the one hand, people's recognition of the benefits of regular physical activity and on the other hand, reducing barriers in order to achieve this, is necessary. Self-efficacy as the most effective structure in this study should be taken into consideration because self-efficacy affects on person's emotions, thoughts, and actions and if someone believes that he can do anything, the likelihood of his success in that task will increase.

### Limitations of the study

One of the limitations of this study is that this study is sectional and has weakness than longitudinal studies in providing behavior predictors.

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### Conflicts of interest

There are no conflicts of interest.

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