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Effect of Perceived Barriers and Self-Efficacy on Daily Exercise among Employees using HBM

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ABSTRACT

Aims This study aimed to determine the relationship between the constructs of Health Belief Model (HBM) and doing daily exercise to prevent cardiovascular diseases (CVDs) among the employees of Ilam University of medical sciences in Iran.

Instrument & Methods About 294 employees of Ilam University of medical sciences participated in this cross-sectional study after providing a written consent form in 2017. The tool to collect data was an HBM-ISCS questionnaire, which was applied. Eventually, the obtained data were analyzed using SPSS 16 and logistic regression.

Findings The results showed that 72.4% of participants did not exercise daily, and the Mean±SD of their daily exercise was 8.08±1.51min. Logistic regression showed that the possibility of daily exercise per unit of increase in perceived barriers decreased by about 10%, while every unit of increase in the self-efficacy score resulted in the possibility of 1.12 times more doing daily exercise. The possibility of doing daily exercise among men was 2 times more than in women, and among the personnel of financial/administrative department, it was about 2.5 times more than in the employees of health care department. Accordingly, the possibility of doing exercise decreased by about 8% per unit of increase in work experience.

Conclusion The amount of doing daily exercise among the participants of this study was low, and implementing interventions commensurate with the results of this study and based on HBM can be effective in improving the amount of doing daily exercise in them.

Keywords Exercise; Cardiovascular; Employees; Health Belief Model

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Introduction

Inactivity is one of the 10 major death causes throughout the world, which increases the risk of cardiovascular diseases (CVDs) two times more [1, 2]; these diseases are the first death cause in Iran and its incidence among Iranians, "on average" in 30 years earlier than among the Europeans and Americans [3]. The lack of enough activity is among the adjustable risk factors of CVDs [4] that has been the cause of 22% of deaths caused by these diseases [5]. It is estimated that doing 120-180 min of physical activity with average severity during the week will decrease the risk factors of CVDs significantly [6]. Nevertheless, most of the countries' level of physical activity [7-9], including Iran [10, 11], is not desirable.

Exercise is a kind of organized physical activity that is done regularly, frequently, and planned, intending to play games and entrainment, gaining more ability, health, or physical fitness [12]. Its key role has been proved in preventing chronic diseases such as CVDs, diabetes, cancer, and skeletomuscular diseases [13].

Green and Kreuter defined health education as "any kind of planned combination of learning experiences that are designed to make people, groups or communities prone and capable to have volunteering behavior leading to health and reinforcing it" [14]. Promoting people's life quality with their involvement in activities related to health, directly and indirectly, is among the main aims of health education and health promotion science. This is accessible by using health strategies through selecting methods of living correctly and health behaviors (doing exercise) [15]. Research evidence indicates that when designing health education interventions, the most effective educational programs are theory-based ones that originate from the models of changing behavior [16, 17]. Furthermore, designing and implementing educational interventions using appropriate models and theories in order to promote physical activity has been suggested by various researchers [18, 19].

This can be because of behavioral complexities since the change of awareness will not always result in changes in attitude, and the change of attitude will not always result in the change of behavior [20]. Determining the factors influencing physical activity is important because it helps planners in the health area apply the most appropriate strategies to improve it [21]. Doing physical activity is influenced by intrapersonal factors [22].

One of the commonly used models in preventing diseases is the health belief model (HBM), exclusively created for behaviors related to health [23]. Health Belief Model (HBM) is a theory that focuses on intrapersonal factors such as knowledge, attitude, and beliefs [24] and has been used extensively as a tool to design educational interventions in order to enhance the adherence of preventive behaviors, including exercise [16]. This model explains the quality of changes in behavior concerning people's health and helps educators review and describe individuals' health behaviors by understanding their beliefs about health [25]. Planning for educational intervention must be according to the facts and exclusivities of different groups [26]. Therefore, given this model explains the quality of changing behavior concerning people's health and helps educators evaluate and describe people's health behavior via understanding their beliefs about health [25]. The importance of determining factors influencing the behavior to design the effective intervention, the present research team decided to study the determinants of doing exercise using HBM among Ilam University of Medical Sciences employees.

Instrument & Methods

This cross-sectional study was conducted on the employees of Ilam University of medical sciences (Iran, 2017). Inclusion requirements were: employment, lack of chronic diseases or those diseases resulting in motor limitation, and completion of the informed consent form.

The sample size was calculated by 263 subjects; however, considering 834 employees under healthcare networks in Ilam Province, the confidence coefficient of 95%, q=p=0.5, d=0.05 and z=1.96 Cochran formula of $n=Nz^2pq/ (Nd^2+z^2pq)$, it was determined 290 subjects with 10% increase. The number of samples in each city was determined according to the number of employees in each city using random and multistage sampling. Finally, 294 subjects were included in the study.

Selecting the samples were as below: after determining the sample size of each city, the research team traveled to that city, and according to the coordination done with university authorities, first, a list of all the targeted employees in the health networks was extracted separately for each center, and then one or more health care centers were selected randomly and proportionally. Then the research team went to the selected center to hold meetings or determine the targeted group, explain the objectives and procedures, and answer the possible questions. In the case of agreement, they received a written informed consent letter from the participants. These participants completed the questionnaire in the form of an interview.

The tool to collect data in this study was an impact of sport on the scale of the cardiovascular disease based on the Health Belief Model (HBM-ISCS) [27] questionnaire including questions regarding the demographic information of the participants, 19 items according to HBM constructs to measure the health beliefs of the employees about the effect of exercise on CVDs, 10 items to measure their

knowledge, and two items to measure doing exercise on daily and weekly basis.

The reliability of the tools was studied using Cronbach's Alpha, and its score was obtained 0.73 for perceived susceptibility, 0.72 for perceived severity, 0.77 for perceived benefits, 0.73 for perceived barriers, and 0.82 for self-efficacy, respectively; all these confirm the desirability of tool's reliability.

Data collection was done as self-reported questioners. Data were analyzed using SPSS 16 and the univariate and multivariate logistic regression method. To decide about a significant relationship, $p<0.05$ was the criterion of judgment.

The research team was obliged to keep the information confidential and received the necessary ethics license from the research council and medical ethics committees of the medical school of Tarbiat Modares university under code no. IR.TMU.REC.1394.148.

Findings

The results showed that half of the participants were male. The mean±SD age and education of participants were, respectively, 36.90±5.96 years and 15.42±1.65 years. About 85.4% of the participants were married, 88.8% had university degrees, and 83.7% were employed in health care departments. The Mean±SD of their work experience was 13.24±7.18 years. The results further indicated that 72.4% of the participants did not do daily exercise so that the mean±SD of their daily exercise of participants was 8.08±1.51min (Table 1).

Table 2 showed the mean score of HBM constructs in the field of exercise to prevent CVDs. Table 3 the predictive variables of doing daily exercise. Presents according to this table, perceived barriers (p=0.048) and self-efficacy (p=0.037) were two effective constructs in the possibility of daily exercise; meanwhile, gender (p=0.014), work experience (p=0.048), and kind of occupation (p=0.009) were among the factors influencing daily exercise.

Table 1) Demographic characteristics of participants (N=294)

Demographic Variable	Mean±SD	N (%)
Age	36.90±5.96	-
Education	15.42±1.65	-
Job experience	13.24±7.18	-
Exercise (daily)	8.08±1.51	-
Sex		
Male	-	147 (50.0)
Female	-	147 (50.0)
Marriage		
Single	-	43 (14.6)
Married	-	251 (85.4)
Education		
Non-academic	-	33 (11.2)
Academic	-	261 (88.8)
Job category		
Health care	-	246 (83.7)
Administrative	-	48 (16.3)
Exercise (daily)		
Yes	-	81 (27.6)
No	-	213 (72.4)

Table 2) Scores of Health Belief Models on CVDs preventive behavior

Variable	Mean±SD	Scale range
Perceived susceptibility	8.24±1.80	2-10
Perceived severity	18.59±3.74	5-25
Perceived benefits	18.66±3.93	5-25
Perceived barriers	9.14±2.63	3-15
Self-efficacy	13.72±3.08	4-20

Table 3) Logistic regression coefficients of HBM constructs and demographic variables to predict doing daily exercise (OR: Odds Ratio)

Independent variable	Univariate			Multivariate		
	β	OR (Lower-Upper)	p-value	β	OR (Lower-Upper)	p-value
Perceived susceptibility	-0.06	0.942 (0.814-1.089)	0.419	-0.153	0.858 (0.699-1.054)	0.144
Perceived severity	0.033	1.033 (0.966-1.106)	0.342	0.082	1.086 (0.971-1.214)	0.148
Perceived benefits	-0.006	0.994 (0.931-1.061)	0.854	-0.097	0.908 (0.818-1.018)	0.097
Perceived barriers	-0.085	0.919 (0.833-1.013)	0.089	-0.112	0.894 (0.800-0.999)	0.048
Self-efficacy	0.053	1.054 (0.970-1.146)	0.214	0.12	1.127 (1.007-1.262)	0.037
Gender						
Female		Ref.			Ref.	
Male	-0.801	2.227 (1.313-3.778)	0.003	0.715	2.045 (1.155-3.618)	0.014
Marriage						
Single		Ref.			Ref.	
Married	-0.021	0.979 (0.476-2.015)	0.955	-0.177	0.838 (0.361-1.945)	0.681
Age	-0.008	0.992 (0.950-1.035)	0.709	0.09	1.094 (0.985-1.216)	0.094
Education	-0.031	0.970 (0.829-1.135)	0.701	-0.108	0.898 (0.758-1.063)	0.21
Job experience	-0.019	0.981 (0.941-1.016)	0.285	-0.088	0.916 (0.839-0.999)	0.048
Job category						
Health care		Ref.			Ref.	
Administrative	0.88	2.411 (1.271 - 4.574)	0.007	0.935	2.546 (1.257-5.159)	0.009
Constant				0.396	1.485	0.033

The logistic regression test showed that the possibility of doing daily exercise decreases by 10% per every unit of increase in perceived barriers while every unit of increase in self-efficacy score resulted in 1.12 more possibility of doing daily exercise. The possibility of doing daily exercise among the men was 2 times more than in women, and among the health care personnel was 2.5 times more than in the employees of financial/administrative departments. Accordingly,

the possibility of doing exercise decreased 8% per unit of increase in the years of work experience (Table 3).

Discussion

Removing or reducing the main risk factors of CVDs can prevent the incidence of more than 80% of these diseases. Some of these risk factors, including inappropriate physical activity with environment modification and changes in people's behaviors or lifestyle, were all modified [28]. Therefore, this study aimed to investigate how to predict doing exercise among the employees of Ilam University of medical sciences by HBM constructs.

The results indicated that 72.4% of the participants did not do daily exercise, and the possibility of not doing daily exercise among the women was two times more than in men. In this study, out of the 81 subjects who use to do daily exercise, only 29 subjects were women. This can be due to cultural problems and perceived barriers of behavior among women who had higher perceived barriers than men in this study.

Another variable influencing daily exercise among the participants in this study was their kind of occupation; in this regard, the possibility of doing daily exercise among the participants who had financial or administrative jobs was 2.5 times more than in those who were working in the health care departments.

Statistical analysis showed that the possibility of doing daily exercise at different ages was the same in this study. In contrast, separate analysis of data related to women showed that there was a significant relationship between age and lack of daily exercise. Furthermore, the possibility of doing daily exercise decreased by 8% per every unit of increase in work experience. Similar results were obtained in Bopp *et al*. [29] and Gazmararian *et al*. [30].

The present study indicated that perceived barriers could predict physical activity. This result is consistent with the results of studies by Vafaee *et al*. [31], Ar-Yuwat *et al*. [32] and Wan Omar *et al*. [33], and Rahmati *et al*. [34]. Data analysis showed that for every unit of increase in perceived barriers, the possibility of daily exercise decreased by about 10%. Identifying behavioral barriers is essential to planning and designing appropriate interventions, and having high perceived sensitivity alone is not enough to adopt behavior (daily exercise).

It was revealed showed that self-efficacy is one of the constructs influencing physical activity. The findings of Hatefnia & Ghazivakili [16] on the factors influencing physical activity to prevent osteoporosis are consistent with this study. Accordingly, in the study by Garza *et al.* [35], self-efficacy was introduced as a strong determinant influencing preventive behavior for CVDs. Brochado *et al.* [8] also referred to the barriers of physical activity and self-efficacy as two psychological and emotional factors influencing physical activity. Data analysis in the present study showed that for every unit of increase in self-efficacy, the possibility of daily exercise increased by 1.12 times more. Self-efficacy indicates the extent to which a person believes in their ability to perform behavior; therefore, high self-efficacy means high self-confidence, increasing the probability of success in adopting behavior (exercise).

One of the limitations of this study was the participants' occupation, and due to this limitation, we cannot generalize the results to all employees in the society. Similarly, self-reporting was another limitation of this study. It can refer to the theory-based nature of this study and appropriate sample size as the two strengths of this study.

Conclusion

The results indicated that the amount of daily exercise among the Medical Sciences University of Ilam employees was low, and among the HBM constructs, self-efficacy and perceived barriers were the main constructs influencing daily exercise to prevent CVDs. Thus, it is suggested to implement interventions commensurate with the results of this study.

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Conflict of Interests: This research was extracted from the first author's PhD dissertation in the Faculty of Medical Sciences, Tarbiat Modares University (Tehran, Iran).

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