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Enabling and Inhibiting Factors of Physical Activity in the Employees of Bandar Imam Petrochemical Complex

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Abstract

Background and Objective: The need for precautionary measures in specific work environments where employees spend a lot of daily work hours led to the study being conducted in the large petrochemical industry in order to investigate the factors enabling and inhibiting the physical activity of employees. Materials and Methods: This analytical study was conducted on 300 employees of Bandar Imam Petrochemical Complex in 2018. The inclusion criteria for entering the study were employees who had an employment action showing official employment, contractual employment, and short-term contractual employment. The instruments of this research were designed by the researcher and distributed among a random sample size of employees of various units of the complex. Data were analyzed using SPSS. Results: The mean score for variables the enabling factors, including security (2.19), facilities (2.72) and access to physical activity spaces in the workplace and living environment (2.42), as well as the score for the inhibiting factors, including environmental barriers (1.96), individual barriers (1.54) and social barriers (1.80), barriers related to the family of employees (1.90), were determined and analyzed comparatively. Discussion: The findings of the study showed that the enabling factors had a greater influence on the physical activity of the employees. Therefore, it is suggested that interfering barriers be studied and effective interventions for each of the variables be established and implemented.

Keywords: Enabling factors, Inhibiting Factors, Physical Activity, Petrochemical Employees

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Introduction

Activity and mobility are an inseparable part of human life that occurs in a particular way in each period. Machine life today has reduced human physical activity and this poverty movement has removed the vitality and happiness from his body and instead replaced the risk factor of obesity (Hojjati, 2014). About 60.1% of the world's population does not do the least recommended physical activity with moderate intensity (Hazavehei, Hasanzade & Shekarchizadeh, 2009).

According to the World Health Organization (WHO) estimates, the immobility in Iranian society is about 34%, which is predicted by 2020 by the same trend, roughly 50% of Iranians will be in low mobility or immobility (Najarmohyabadi, Amini & Haghani, 2014). The results of the National Survey in Iran, published by the WHO, have shown that the prevalence of immobility in urban and rural areas, with an emphasis on physical activity of leisure time, between men and women in the age group of 15-64 years was 76% and 58.8%, respectively and in total, it was 67.5% in the same age group (Hojjati, 2014). Cross-sectional national studies have shown that the level of physical activity decreases throughout life, but is not linear. One of the most significant declines in participation in physical activity occurs in adulthood (age 25-44). The passage of various stages of life "for example, employment and education, and family formation" are emerging as potential reasons for a significant reduction in participation in physical activity (Allender & Foster, 2008).

According to the American Heart Association's recommendation, for the maintenance and promotion of health in adults aged 18-65, 30 minutes of moderate aerobic activity and 5 days a week or 20 minutes of severe aerobic activity are required at least 3 days a week (Haskell et al., 2007). But unfortunately, people do not have much participation, especially during physical activity, and their level of activity decreases with age (Costanzo et al., 2006). In this regard, employees have the minimum physical activity at work (Nikpour & Haghani, 2006), and due to long hours of work and high travel time from home to work, vice versa, time does not actually remain for them to carry out sporting activities. Therefore, providing strategies and training for more useful use of time, performing sporty activities at home and at work is one of the important tasks of the health team. The theory of planned behavior has been widely used to study the behavior of physical activity in different populations.

The relationship between lifestyle and chronic diseases requires that evidence-based strategies be considered for improving behavioral risk factors such as healthy eating and regular physical activity in each community. Given the benefits of such strategies for employees, this group can be the target group for these strategies in the workplace (Lisa Quintiliani Research fellow, 2015). Among non-communicable diseases (chronic), cardiovascular diseases are the most common cause of death in most countries of the world and the most important cause of disability (Azizi & Hatami, 2010). Regular physical activity is a preventive measure in health promotion; delaying mortality and chronic illness; decreasing anxiety and depression; improving mental health and improving quality of life (Moeini et al., 2010).

The WHO recommends at least 30 minutes of physical activity per week (Shen et al., 2008). The results of 27 prospective studies show that regular physical activity can reduce the risk of heart attacks by 35 to 50%. These studies also show that the effect of regular physical activity on heart disease is more than other factors (cigarettes, blood pressure, and blood lipids). Despite the many benefits of physical activity, studies in Iran show that more than 70% of people do not exercise enough (Plotnikoff, Hotz & Rhodes, 2001).

Recent research, especially in the twentieth centuryد, show that proper and continuous exercises improve and increase strength, muscular endurance, cardio-respiratory endurance, flexibility, as well as fitness and reduce body fat. In fact, the goal of continuous activity and exercise is to achieve a favorable physical condition for more health and happiness and a longer useful life (Amini & Saffari, 2014). The importance and role of physical activity in controlling weight are to determine the proper level of physical activity to prevent obesity. Therefore, the use of a scientific and appropriate method to facilitate adaptation and maintain the proper amount of physical activity in weight control is important (Jafari et al., 2007).

Physical activity is related to the reduction of the risk of cardiovascular disease, (Faghri et al., 2008) the types of cancers, diabetes and obesity (Dunn, 2002), and hypertension and other chronic diseases (Olivera-Brochado & Quelhas Brito, 2010; Robertson-Wilson & Richard, 2009). Regular physical activity as significant health-promoting behavior has prevented and or delayed a variety of chronic diseases and early mortality (Aghamolaei & Hassani, 2009). The determinants of physical activity are numerous and vary from society to society (Batey et al., 2014). Low physical activity of employees is susceptible to skeletal illnesses, pain in absenteeism and other negative health outcomes (Dunn, 2002). The low level of physical activity among the employees leads to (U. B. Musculoskeletal Disorders and the Workplace: Low Back and Upper Extremities, 1995) absenteeism, the loss of quality of life, and the amount of work-increasing health costs and short-term illnesses; so employees need to have programs that increase their physical activity in the workplace (Pronk et al., 2004; Burton, Chen & Edington, 2005). Strong scientific evidence over the past 30 years (1984-2004) has highlighted the importance of intolerance as a primary and independent risk for all deaths and the spread of common diseases (Tehrani et al., 2016). Regular physical activity is a global health priority for the prevention of diseases and it is one of the priorities of public health (Owen et al., 2004). The healthy human recommendation until 2010 and the general health guidelines of the international community is that all people have at least 30 minutes of average physical activity for most days and preferably all the days of the week. Despite these recommendations, the level of physical activity in many parts of the world has dropped from the desired level and has steadily declined (Cerin & Owen, 2009) so that 60% of the world's population does not have physical activity for their own health, which is one of the causes of chronic illness (Ronda & Brug, 2001).

It is estimated that 120-120 minutes of physical activity with moderate intensity each week significantly reduces the risk factors for cardiovascular disease. Most researchers believe that the most cost-effective way of treating chronic diseases may be to prevent them from occurring at first. If people change their health habits, these diseases can be widely managed and prevented (Proper and Van Maken 2008). Direct costs of low mobility alone account for approximately 2 and 2.4 percent of annual health care costs in the United States and Europe (Proper 2004).

Physical activity is a multifactorial behavior that is influenced by interpersonal, interpersonal, environmental factors (Huang, Sharpe & Waid, 2010; Pan et al., 2009) and social (Huang, Sharpe & Waid, 2010; McNeill & Subramanian, 2006). Several studies have identified barriers to physical activity such as: financial status (Pan et al., 2009; Nakkash, Nehlawi & Shediac-Rizkallah, 2003) lack of stress, social support (Folta et al., 2008), and cultural barriers, such as the lack of special sports facilities for women (Nakkash, Nehlawi & Shediac-Rizkallah, 2003; Farooqi, Edgar & Khunt, 2007) and environmental barriers such as the inappropriate structure of the environment, insecurity of the neighborhood and in appropriate weather (Chow et al., 2009).

These studies did not apply health behavior theories to identify health problems, behavioral and environmental causes, and their

determinants. Theories provide valuable tools for understanding and solving a wide range of behavioral problems. There are several health-behavior theories in the scientific literature, each of which tries to explain why individuals behave or fail to behave (S. N. Health educator's guide to theories of health behavior, 2006). Therefore, in order to develop effective strategies for promoting physical activity with consideration of health outcomes, researchers should have a deep understanding of the factors affecting physical activity (Crosby, 2011). Therefore, according to the research literature, the purpose of the present study was to compare the factors enabling and inhibiting physical activity in employees working in Bandar Imam Petrochemical Complex.

Materials and Methods

This study was carried out as a survey in 2018 on research samples selected from Mahshahr petrochemical workers referred to the health center of the complex. The sample size was calculated with 95% confidence. In the first stage, 350 employees were calculated. During the study, 50 employees were excluded. Finally, 300 employees responded to the questionnaire, as well as their address and telephone number were extracted from their files.

The subjects were selected by random sampling method. Participants in this study included managers, middle managers, shift supervisors, and staff members who were clearly able to provide the researcher with information about the physical activity of the complex, given their presence in the field. To observe ethical considerations, the name of the participants was not written and the code was used instead. In addition to the confidentiality of information, employees were enrolled in the study, according to their desire, and there was no compulsion for their participation. The inclusion criteria for entering the study were employees aged 20 to 60 years old, and exclusion criteria included the inability to perform physical activity and psychological problems that made collaboration impossible. Demographic questionnaire, a questionnaire of enabling and inhibiting factors of physical activity were used to collect data. The questionnaire of the inhibiting and enabling factors included components in two areas of inhibiting and enabling factors of physical activity. Enabling factors were security variables, facilities and access to physical activity spaces in the workplace and living environment. inhibiting factors included environmental barriers, individual and social barriers, barriers to family members. However, after selecting eligible individuals to participate in this study, and describing goals, written consent forms for participation in this study were taken from the participants and it was announced that all information on individuals would be preserved, and participants could withdraw if they did not wish to continue to participate in the study. Inclusion criteria: 1) employees aged 20-60 years old; 2) at least the ability to read and write; 3) Residing in Mahshahr city and work in the petrochemical industry of Bandar Imam Khomeini; 4) no participation in any physical activity related programs for the last six months; 5) no physical activity related diseases (such as rheumatoid arthritis); 6) tend to participate in the study. The questionnaire consisted of 55 questions (35 questions about enabling factors and 20 questions for inhibiting factors). In this research, before the implementation of the large-scale questionnaire, at first, questionnaires were distributed among 40 employees. The results showed that Cronbach's alpha coefficient for its internal consistency was 0.92 and the validity of the questionnaire was 0.88. Data analysis was performed using SPSS version 21. Descriptive statistics (mean and standard deviation) and inferential statistics (independent t-test, Mann-Whitney test, Friedman test, and single-sample t-test) were used. For all tests, the error level less than 0.05 was considered significant.

Results

In this study, a total of 300 employees (14.3% women and 85.7% men) responded to the questionnaires. The mean age of participants was 40.97 ± 8.92 years, the mean weight was 79.77 ± 16.31 kg, mean height was 171.83 ± 12.61 cm, 15.3% were single and 84.7% were married. 34.9% were officially employed, 35.2% were contractual, 29.6% were short-term contractual. Among demographic factors, place of work variable, type of work, education degree and marital state were predictors for enabling factors and the variables such as the service unit, type of work, and education degree were predictors for inhibiting factors.

The mean and standard deviation of the enabling and inhibiting factors of the participants in the study were 85.48 ± 19.54 and 37.84 ± 10.62, respectively.

Table 1. Mean and standard deviation of the scores of variables and components studied among employees of Mahshahr Petrochemical Complex

Variables	Components	Number	Mean	SD	Minimum	Maximum
Enabling factors	Security	300	21.9128	6.55543	10.00	47.00
	Facilities	300	27.2399	8.52103	10.00	50.00
	Access to physical activity spaces in work and life	300	36.3364	8.16694	15.00	56.00
	The total score of enabling factors	300	85.4891	19.54452	35.00	140.00
Inhibiting factors	Environmental barriers	300	9.8131	3.13986	5.00	22.00
	Individual barriers	300	7.7290	2.58929	4.00	17.00
	Social barriers	300	9.0436	3.16987	5.00	19.00
	Barriers related to the family of employees	300	9.5358	3.85107	5.00	23.00
	Score of total inhibiting factors	300	37.8474	10.62684	20.00	66.00

Table 2. The matrix of the correlation coefficient of enabling factors and inhibiting factors and demographic characteristics of petrochemical employees

Variables		Enabling factors	Inhibiting factors	Age	Weight	Height	Experience	Education
Enabling factors	r level	1						
	Significance level							
Inhibiting factors	r level	-0.452	1					
	Significance level	0.001						
Age	r level	0.107	0.056	1				
	Significance level	0.057	0.320					
Weight	r level	0.059-	0.002	0.124	1			
	Significance level	0.300	0.975	0.029				
Height	r level	-0.066	-0.021	0.005	0.087	1		
	Significance level	0.244	0.715	0.0928	0.130			
Experience	r level	0.145	0.093	0.892	0.162	0.030	1	
	Significance level	0.011	0.104	0.000	0.005	0.600		
Education degree	r level	-0.122	-0.040	0.012	0.057	0.094	-0.058	1
	Significance level	0.029	0.379	0.937	0.316	0.100	0.311	

**Statistical test: Pearson correlation test; P <0.05, P <0.01

Table 3. Mean and standard deviation of scores of variables and components studied among petrochemical employees

Variables	Components	T level	Average Rankings	Rank
Enabling factors	Security	-22.103	2.19	4
	Facilities	-5.80	2.72	1
	Access to physical activity spaces in work and life	-19.0	2.42	2
	Total score of enabling factors	-17.88	2.44	1
Inhibiting factors	Environmental barriers	-29.59	1.96	1
	Individual barriers	-50.311	1.54	9
	Social barriers	-33.66	1.80	7
	Barriers related to the family of employees	-25.42	1.90	5
	Total score of inhibiting factors	-37.34	1.89	8

Discussion and Conclusion

A review of the results suggests that the enabling factors have a greater impact on employees' physical activity compared with inhibiting factors. Also, the most effect and the least effect of enabling factors were related to the components of facilities and security, respectively. Among the inhibitory variable components, the greatest effect was related to the environmental barriers and the least effect was related to the component of individual barriers. Today's communities need an appropriate program to promote physical activity in their employees. Regarding the role of health care providers in improving the health of the community and taking into account the profound changes that have taken place in various dimensions of health services, the need for deep knowledge of the determinants of physical activity in employees has become important. This leads to proper planning to improve the level of physical activity, and by creating a healthy and rich environment of necessary and productive facilities, providing the individual and social health of the community as well as reducing the costs associated with the treatment of preventable diseases. According to this information, policymakers must take steps to develop and grow physical activity (Motl et al., 2007). Scientific evidence suggests that the risk of low mobility disease is significantly reduced in people with regular physical activity and physical fitness. Physical activity has protective effects against many chronic diseases, including coronary artery disease, high blood pressure, obesity, diabetes, osteoporosis, cancer, depression, and anxiety, while at least 60% of the world's population do not do the recommended minimum of the moderate intensity activity. These results are consistent with studies by Amini et al. (2014), Hazavehei et al. (2009), Pazoki et al. (2007), Nayan and Ramesh (2014), Tartibian and Zarneshan (2008), Jalalinia and colleagues (2010). In evaluating the effectiveness of e- learning program on increasing physical activity and BMI of female employees,, Amini et al. (2014) showed that there was no significant difference in the level of physical activity before training in the score of the subjects in the intervention and control groups, but then the average score in the intervention group increased up to three times and was significantly higher than the control group, which shows the positive effect of the educational programs in the intervention group The result is that web-based education interventions, SMS, multimedia can increase physical activity in female employees. It may be possible to prevent diseases caused by low mobility.

In the study of the effect of the educational program of physical training 2 on the regular activities of female students of the University of Medical Sciences adjusted on the basis of the BASNEF model, Hazavehei et al. (2009) concluded that the mean scores of the components of the BASNEF model were significantly different between the control and intervention groups after the educational intervention. The intervention group

significantly improved the performance of regular physical activity 2 and 4 months after the end of the training program. In an attempt to study the effects of a community-based program of the healthy heart on increasing the activity of women in randomized controlled trials with community-based collaborative research, Pazoki et al. (2007) showed that number of the participants who reported having physical activity, 3% and 2.7% at the beginning of the study in the intervention and control groups, respectively, increased to 13.4% and 3% at the end of the study in the intervention and control groups, respectively. Participants in the intervention group showed more physical activity in the week than women in the control group. The intervention group showed a significant reduction in systolic blood pressure. Intervention based on community-based collaborative research method can be effective in changing the physical activity in women in the short term (Pazoki, Seyednezami & Imami, 2007). The purpose of this study was to explain the factors that strengthen the physical activity of the employees of the petrochemical industry in the form of one of the three main categories of the educational phase of the PRECEDE model, consisting of predisposing, empowering and reinforcing factors. The results of this study showed that factors such as the physical activity benefits in individual and social health were one of the most important factors in the physical activity of employees and was confirmed by a large part of the employees. A study conducted by Xinx in China also showed that most participants fully agree with the benefits of physical activity. In the dimension of social health, the tendency of human to be seen and considered is always the lever of his or her movement towards the behaviors that make this goal possible. In the meantime, the business benefits of physical activity and the outcome of organizational productivity were explained by the participating staff. A meta-analysis of 56 studies in the time period of 1982-2005 showed that measures to improve the health of the workplace have reduced the absenteeism and health costs and has led to employee productivity (Chapman, 2005). Matthew Watts and Chad Harris reported that over ninety percent of the people tested had agreed that exercise contributes to their productivity at work (Harris, 2003). They considered physical activity in the workplace and the living place as a source of more familiarity and social interaction with regard to the interactive benefits of the employees surveyed. The familiarity of the industry staff in the settlements, the greater interaction in the sports site of the residential complex, the opportunity to be together and more interaction with colleagues and the family, as well as reputation in the community, included the interactive benefits of physical activity that positively impacted the employees. In a study on hospital staff, Jacobson found the role of exercise in controlling pain when working with colleagues in the workplace was much more effective than loneliness at home.

A remarkable point in the research findings was that a large percentage of employees who knew different types of physical activity benefits of health but were less interested in doing it. Physical activity enhancement factors were only more prominent than participants' knowledge and did not gain more experience at the stage of taking action for physical activity. Based on findings from employee experiences, social health benefits are physical activity in terms of job interests and productivity, through pay benefits such as higher scores in the merit pay form of individuals with regular physical activity, diverse physical activity with neighborhoods, weekend round-trips and family competitions by awarding cash awards aimed at enhancing the level of interaction, followed by enhancing physical activity, identifying successful physical exercise and sport as a prominent staff with a spirit of the championship in the field of revered activists and athletes with good morals and, ultimately, employees who have higher physical, mental, and spiritual health, according to the Center for Occupational Health Center and Behavioral Counseling Center tests, are honored by the highest authority.

The findings of this study showed that immobility is one of the behavioral factors associated with cardiovascular risk factors. The determinants of this behavior that need to be corrected include individual factors (predispositions) and environmental factors (social environment, including employees and families, and the physical or structural environment, including availability and access to resources, rules and policies, and new skills). Self-efficacy, perceived barriers, physical activity skills, social support were among the strongest predictors of physical activity. Identifying these determinants helps health planners to select the appropriate methods and strategies to modify these determinants and reduce inactivity in order to improve the metabolic risk factors and prevent cardiovascular diseases. Because the most immediate effect of an intervention is on specific behavioral determinants and environmental conditions, and in the end, this study was accompanied by some limitations. One of these limitations was that the researcher was conducting research in the petrochemical industry's stressful environment so that the staff did not have much interest in describing the events of the working environment that was one of the key industries. Specific conditions require an extra effort to explore and categorize the true experiences of the participants.

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