Published online 2022 March 20 **Original Article**

# The Relation between Increased Physical Activity to More Job Satisfaction of Employees: A Cross-sectional Study in Shahid Beheshti University of Medical Sciences, Tehran, Iran

Maryam Hajian[1], Shahram Mohaghegh[2,*], Eznollah Azargashb[3] and Mohammad Reza Sohrabi[4]

[1] Community Medicine Specialist, Research Center for Addiction Research and Risky Behaviors, Iran University of Medical Sciences, Tehran, Iran
[2] Sports and Exercise Medicine Specialist, Research Center for Health Management in Mass Gathering, Red Crescent Society of the Islamic Republic of Iran, Tehran, Iran
[3] Associate Professor, Department of Higher Education Management, Shahid Beheshti University of Medical Sciences
[4] Community Medicine Specialist, Department of Community Medicine, Shahid Beheshti University of Medical Sciences

*** *Corresponding author:*** Shahram Mohaghegh, Iran-Helal Institute of Applied Science and Technology, Red Crescent Society of the Islamic Republic of Iran, Tehran, Iran. Tel: +9891230409654; Email: shahrammohaghegh5@gmail.com

**Received** 2021 November 13; **Revised** 2021 December 06; **Accepted** 2022 January 26.

**Abstract**

**Background:** Sedentary lifestyle has been associated with many chronic conditions and is recognized as a leading cause of total mortality. Regular physical activity can reduce the risk of cardiovascular diseases, diabetes, and osteoporosis and increase fitness, balance, muscle strength, and improve psychological function and self-satisfaction.

**Objectives:** Therefore, the present study aimed to determine the physical activity level among employees working at the Shahid Beheshti University of Medical Sciences, Tehran, Iran to find any relationship between physical activity level and job satisfaction, which is crucial for professional success and productivity.

**Methods:** In this cross-sectional study, 300 administrative staff members were randomly selected in the proportion of their numbers from various deputies, faculties, hospitals, health networks, and centers of the Shahid Beheshti University of Medical Sciences using multistage sampling. The subjects were selected from both male and female employees. The data were collected through a demographic questionnaire, International Physical Activity Questionnaire (IPAQ), Visoki, and Chrome's Job Satisfaction Questionnaire.

**Results:** Mean and standard deviation of physical activity of employees were 3021.83 and 2688.65 MET-minutes/week, respectively. The average was slightly higher than the moderate level of physical activity according to IPAQ. The average and standard deviation of job satisfaction of workers were 112.36 and 26.16, respectively, which were relatively good. Physical activity and job satisfaction of female workers were higher than those of their male colleagues (P= 0.019, P= 0.036 respectively). A significant difference was observed between the level of physical activity of workers and their job satisfaction as workers with higher levels of physical activity had more job satisfaction (P< 0.001).

**Conclusion:** Regarding the significant relationship between physical activity and job satisfaction, physical activity and exercise of employees in the workplace are crucial. Future prospective studies can validate this association.

*Keywords:* Employee, Job satisfaction, Physical activity

## 1. Background

According to WHO, physical activity is the first health indicator of society (1). Sedentary lifestyle is recognized as the primary risk factor for total death rate, with 2 million deaths worldwide annually due to insufficient physical activity (2, 3). Regular physical activity prevents cardiovascular diseases, osteoporosis, and cancers (4). Ample evidence indicate that regular exercise and physical activity effectively promote mental health and life satisfaction, and reduce the symptoms of depression and anxiety (5, 6, 7). However, 60% of the world population fails to perform the recommended level of physical activity. According to Physical Activity Guidelines for Americans, adults between 18 and 64 should do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic exercise per week, and preferably, should be spread throughout the week (8).

In modern organizations, different stresses are imposed on employees. This is a tangible and undeniable issue in all workplaces. Exercise helps to cope with such pressures and stresses. Many studies have shown that regular exercise and physical activity can reduce such pressures (9). Health status, leisure time, and healthy recreation of staff have been considered in many organizations regarding the importance of human resources (10). Job satisfaction in the workforce is an effective factor in increasing productivity and reducing incentives, absenteeism, delays, dismissals, protests, and early retirement (11). According to studies conducted on job satisfaction of employees, a certain relationship is observed between job satisfaction and mental-physical health of employees (12).

Despite extensive studies on factors affecting job satisfaction and the considerable impact of physical activity on various aspects of life, the relationship between physical activity and job satisfaction of staff has not been determined. Two meta-analyses examined the relationship between participation in organizational wellness programs including exercise and job satisfaction in the USA 2008 (13), and

Netherlands 2002 (14) and different results were obtained. Therefore, no specific conclusion can be obtained based on these two studies. Additionally, introducing ways to create higher job satisfaction and productivity of employees is essential since the productivity and efficiency of an organization depend on the productivity and satisfaction of its staff (15).

## 2. Objectives

Hence, the present study aimed to examine the relationship between physical activity and job satisfaction of administrative staff working at Shahid Beheshti University of Medical Sciences.

## 3. Methods

The present study was a descriptive and cross-sectional one conducted in 2013. The participants were all administrative employees working in deputies, faculties, hospitals, health centers, and associated healthcare networks of Shahid Beheshti University of Medical Sciences except for faculty members, managers, treatment staff, and service personnel. Based on WHO reports and previous data on physical activity and job satisfaction studies (minimum 15% for both ) sample size was estimated according to $n=\frac{Z^2P(1-P)}{d^2}$ formula.

The sample size was calculated at 196, however, it reached 294 subjects by applying a cluster coefficient of 1.5. Finally, 300 subjects were studied for simplicity. The subjects were selected through simple random sampling in the proportion to their numbers in different departments of the university from male and female employees using the multistage sampling method. The data were collected through the international physical activity questionnaire (IPAQ), Visoki and Chrome's Job Satisfaction Questionnaire, and a demographic questionnaire. IPAQ was designed with the support of WHO; furthermore, the validity and reliability of the questionnaire were also confirmed (16, 17). Various studies on the Iranian population have also confirmed the validity and reliability of IPAQ (18, 19, 20). This questionnaire includes some items that classify physical activity into three low, moderate and high categories which investigates the frequency and duration of physical activities of individuals within the past week and determines the intensity of activities within the past seven days based on the Metabolic Equivalent (MET) Score. According to IPAQ, MET was considered between 3 and 8 for low, moderate, and vigorous-intensity activities (METs corresponding to low, moderate, and vigorous-intensity activities are 3.3, 4, and 8, respectively). Accordingly, physical activities were classified into three categories: low (<600 MET-min/week), moderate (600-3000 MET-min/week), and high (>3000 MET-min/ week) (21).

Visoki and Chrome's Job Satisfaction Questionnaire was employed to determine job satisfaction in five facets: work, colleagues, promotion system, and payment. This 39-item questionnaire is based on a five-point Likert scale (strongly agree=5 to strongly disagree=1). The validity and reliability of this questionnaire have been confirmed in previous studies (15, 22, 23).

The collected data were entered into SPSS software (version 20). Data were analyzed using t-test, ANOVA, Chi-Square, Spearman Correlation Coefficient, and Logistic Regression. All tests were performed at a significance level of less than 0.05.

## 4. Results

The demographic characteristics of the subjects are reported in Table 1.

**Table 1.** Demographic characteristics of the studied employees of the university in 2013

| | |
|---|---|
| **Gender n(%)** | |
| Female | 174(58%) |
| Male | 126(42%) |
| **Marital status n(%)** | |
| Single | 98(32.7%) |
| Married | 201(67%) |
| Having deceased spouse | 1(0.3%) |
| **Workplace n(%)** | |
| Deputies | 124(41.3%) |
| Faculties | 68(22.7%) |
| Hospitals | 94(31.3%) |
| Health centers and network | 14(4.7%) |
| **Education level n(%)** | |
| Diploma | 52(17.33%) |
| Associate degree | 53(17.70%) |
| BA | 133(44.3%) |
| MA | 58(19.33%) |
| Ph.D. and higher | 4(1.3%) |
| **Age in years (Mean±SD)** | 36.61±7.64 |
| **Number of children of married employees (Mean±SD)** | 1.19±0.90 |
| **Work experience in years (Mean±SD)** | 12.25±7.75 |

**Table 2.** Statistical analysis of the relationship between physical activity and the studied variables

| | Physical activity | | | P-value |
|---|---|---|---|---|
| | Low | Moderate | High | |
| **Age (Mean± SD)** | 34.67±6.38 | 36.99±7.39 | 36.83±8.39 | 0.204 |
| **Number of children (Mean± SD)** | 1.24±1.05 | 1.17±0.83 | 1.22±0.96 | 0.922 |
| **Work experience (Mean± SD)** | 9.40±6.72 | 13.15±7.83 | 12.07±7.81 | 0.020 |
| **Gender n(%)** | | | | |
| Female | 16(9.2%) | 95(54.6%) | 63(36.2%) | 0.019 |
| Male | 26(20.6%) | 60(47.6%) | 40(31.8%) | |
| **Marital status n(%)** | | | | |
| Single | 17(17.2%) | 44(44.4%) | 38(38.4%) | 0.196 |
| Married | 25(12.4%) | 111(55.2%) | 65(32.4%) | |
| **Workplace n(%)** | | | | |
| Deputies | 10(8.1%) | 67(54%) | 47(37.9%) | 0.003 |
| Faculties | 13(19.1%) | 42(61.8%) | 13(19.1%) | |
| Hospitals | 19(20.2%) | 40(42.6%) | 35(37.2%) | |
| Health centers and network | 0(0%) | 6(42.9%) | 8(57.1%) | |
| **Education level n(%)** | | | | |
| Diploma | 9(17.3%) | 25(48.1%) | 18(34.6%) | 0.271 |
| Associate degree | 6(11.3%) | 34(64.2%) | 13(24.5%) | |
| BA | 19(14.3%) | 60(45.1%) | 54(40.6%) | |
| MA and higher | 8(12.9%) | 36(58.1%) | 18(29%) | |
| **Field of study n(%)** | | | | |
| Basic sciences | 6(9.4%) | 35(54.7%) | 23(35.9%) | 0.855 |
| Social and human sciences | 19(14.4%) | 70(53%) | 43(32.6%) | |
| Experimental sciences | 11(15.5%) | 34(47.9%) | 26(36.6%) | |
| Engineering and technical sciences | 6(19.3%) | 14(45.2%) | 11(35.5%) | |

**Table 3.** Mean value and standard deviation of job satisfaction based on the intensity of physical activity of the studied employees of the university

| Physical activity | Job satisfaction | | | | | P-value |
|---|---|---|---|---|---|---|
| | N | Mean | SD | The confidence level of 95% | | |
| | | | | Upper | Lower | |
| **Low** | 42 | 87.81 | 25.45 | 95.74 | 79.88 | <0.001 |
| **Moderate** | 154 | 109.36 | 21.68 | 112.81 | 105.90 | |
| **High** | 103 | 126.87 | 23.67 | 131.50 | 122.25 | |
| **Total** | 299 | 112.36 | 26.16 | 115.34 | 109.39 | |

The mean value and standard deviation of physical activity of employees working at Shahid Beheshti University of Medical Sciences were equal to 3021.83±2688.65 Min-MET/week. Low, moderate, and high-intensity physical activities in employees were estimated at 14%, 51.7%, and 34.3%, respectively. Mean value and standard deviation of sitting time (immobility), low, moderate, vigorous-intensity physical activities, and exercise per week were equal to 3474.20±1081.36, 113.45±96.68, 145.25±132.59, 40.30±76.46, 82.40±115.39 minutes, respectively.

Table 2 represents the different variables of physical activity among studied employees. As can be seen in this table, no significant association is observed between the level of physical activity and age, marital status, number of children, level of education, and field of study. However, a significant relationship was found between the level of physical activity and workplace, work experience, and gender at significance levels of 0.003, 0.020, and 0.019, respectively.

The mean value and standard deviation of job satisfaction of studied employees were 112.36±26.16 scores with minimum and maximum scores of 56 and 194, respectively. As can be seen in Table 3, the mean value and standard deviation of job satisfaction based on low, moderate, and high-intensity physical activity were 78.81±25.45, 109.36±21.68, and 126.87±23.67 scores respectively. According to the results of ANOVA, a significant difference was observed (P<0.001) between the mean value of job satisfaction at different levels of physical activity. Indeed, increasing the level of physical activity of employees led to a significant increase in the mean value of their job satisfaction. Also according to Tukey's Post Hoc Tests, a pairwise comparison between the mean value of job satisfaction at different levels of physical activity revealed a significant difference at all levels (P<0.001).

Spearman correlation coefficient between physical activity and job satisfaction of employees working in Shahid Beheshti Medical University was 0.469, which was positive and significant (P<0.001).

As shown in Table 4, the results of logistic regression analysis indicated that among the level of physical activity, age, gender, education, marital status, number of children, and work experience of employees, only two factors (level of physical activity and gender) could predict the job satisfaction of employees (P<0.001). The chance of job satisfaction in people with high levels of physical activity was 3.5

**Table 4.** Results of logistic regression analysis between job satisfaction and predictor variables among the studied employees

| | Job satisfaction | | | | | |
|---|---|---|---|---|---|---|
| | B | S.E. | P-value | Exp(B) | 95% C.I.for EXP(B) | |
| | | | | | Lower | Upper |
| **Level of Physical activity** | 1.67 | 0.36 | <0.001 | 5.31 | 2.60 | 10.81 |
| **Age** | 0.00 | 0.03 | 0.80 | 1.00 | 0.93 | 1.08 |
| **Gender** | 0.80 | 0.36 | 0.02 | 2.23 | 1.08 | 4.60 |
| **Education** | 0.39 | 0.30 | 0.19 | 1.47 | 0.82 | 2.66 |
| **Marital status** | -0.19 | 0.35 | 0.58 | 0.82 | 0.41 | 1.65 |
| **Number of children** | -0.08 | 0.19 | 0.67 | 0.92 | 0.63 | 1.34 |
| **Work experience** | -0.00 | 0.03 | 0.91 | 0.99 | 0.92 | 1.07 |
| **Constant** | -0.99 | 1.06 | 0.34 | 0.36 | | |

times higher than in those with low levels of physical activity. Moreover, the chance of high job satisfaction among female employees was 2.2 times higher than that of men.

## 5. Discussion

In the present study, the mean value of the physical activity of employees was 3021.83MET-min/week, which was slightly higher than the average level based on IPAQ. The obtained metabolic equivalent was not consistent with the result of Maciel et al. (2010) (24), who studied university community (students and staff) in Brazil and reported moderate physical activity of 2114.5MET-min/week. The difference in results may be due to cultural differences between Iran and Brazil. The low, moderate, and high levels of physical activity of employees in the present study were 14%, 51.7%, and 34.3%, respectively. This finding was not in line with results obtained by Motefaker et al. (25) who conducted a population-based study in Yazd, Iran, and reported low, moderate, and high levels of physical activity equal to 65.8%, 13.8%, and 19.8%, respectively. The difference seems to be related to the homogeneity of the participants in the present study and the heterogeneity of the studied population in Yazd which covered all age, gender, and occupational groups.

In terms of duration of physical activity according to intensity, our participants spent more time in physical activity with sitting, moderate, low, and vigorous intensities, respectively. This finding is consistent with those of Zabihi et al. (20) who evaluated the level of physical activity in the urban population of Babol.

Also, a significant relationship was observed between physical activity and the gender of employees which is due to home activities done by female employees along with their work activities. This finding was consistent with Ranasinghe et al. (26) who found a higher physical activity rate among women than men.

The present study failed to find any significant difference between levels of physical activity and the age of employees. In other words, age was not an underlying factor in the physical activity of employees. This finding is consistent with that of Gharlipour Gharghani et al. (27). According to previous studies, a negative correlation was found between physical activity and age (28, 29, 30), so that by increasing age, gradual reduction in physical activity begins.

Also, no significant relationship was observed between the level of physical activity and the marital status of university employees. This finding was consistent with those of Motefaker et al. (25) and Gharlipour Gharghani et al. (27), who found no difference between levels of physical activity in married and single groups.

The present study found no statistically significant relationship between physical activity and the level of education in studied employees which was not matched with the results of Hernandez et al. (31) who found lower levels of physical activity among individuals with lower levels of education. The difference may be related to the lower variation of levels of education in the present study. Jalilian et al. (32) found lower physical activity among women with a Ph.D. degree who worked at Hamedan University, Iran.

The level of physical activity of individuals working in healthcare networks was higher than those working in hospitals, faculties, and university deputies. The above-mentioned differences may be due to positive attitudes of staff in health centers towards the importance of mobility in health and lifestyle.

According to the estimated job satisfaction of university administrative staff, the overall mean value of job satisfaction was relatively good. The finding was in line with that of Purgaz et al. (15) who studied job satisfaction of nurses working in hospitals located in Zahedan, Iran, and the result of Narimani et al. (33) who studied job satisfaction of staff of Ardabil University.

In the present study, multivariate analysis introduced the level of physical activity and gender as factors predicting the job satisfaction of employees. A positive and significant correlation was observed between physical activity and job satisfaction of employees. In this case, Samuel Yeboah Asuamah et al. (34) concluded that exercise increased job satisfaction and productivity. Moreover, Noorbakhsh and Ghanbari (35) reported the important role of physical activity in improving the job satisfaction of

university staff. Some recent experimental studies also confirm the positive effects of physical activity on job satisfaction of office workers [36] and overweight employees (37). Also, higher levels of physical activity are associated with lower perceptions of stress in workers (38).

A significant relationship was observed between higher job satisfaction of employees and the female gender. This finding was not in line with results obtained by Pour Soltani (39) and Gholami Fesharaki (40) who found no significant difference between job satisfaction and gender. The relationship between job satisfaction and gender possibly is influenced by cultural differences and specific conditions of studied populations, including being a family head, living independently, women's job expectations, and lower responsibility of women for livelihood.

One of the study limitations was that the important factors that have considerable impacts on job satisfaction such as working hours and salary were equated by selecting only administrative staff and eliminating faculty members, managers, physicians, and nurses (as treatment staff) and service staff, and eliminating all confounding factors which may affect the level of physical activity of participants is not possible as the present study is a cross-sectional one. Therefore, it can only be argued that increased physical activity is related (not attributed to a causative factor) to more job satisfaction of employees. Another limitation was related to collecting physical activity data through a self-report questionnaire which may affect the accuracy of data through recall bias.

## 6. Conclusion

Regarding the significant relationship between physical activity and job satisfaction, physical activity and exercise of employees in the workplace are crucial. Future prospective studies can validate more this association.

## Acknowledgments

The present article is extracted from the thesis of the first author. The authors would like to express their sincere gratitude to all those who helped in conducting the study and all administrative staff of Shahid Beheshti University of Medical Sciences who participated in this study.

## References

1. Lee C. D, Blair N, Jackson S. Cardiorespiratory fitness, body composition and cardiovascular disease mortality in men. *Am J Clin Nutr*. 1999; **69**(3): 373- 80. doi: 10.1093/ajcn/69.3.373. [PMID: 10075319].
2. World Health Organization. Physical inactivity: a global public health problem. http://www.who.int/dietphysicalactivity/factsheet_inactivity/en/index.html.
3. World Health Organization. Physical inactivity prevalence.
4. United States Department of Health and Human Services (2000). Healthy People 2010:Understanding and Improving Health. 2nd edition. https://eric.ed.gov/?id=ED443794
5. De Assis MA, De Mello MF, Scorza FA, Cadorbbi MP, School AF, Da Silva SG et al. Evaluation of physical activity habits in patients with posttraumatic stress disorder. *Clinics*.2008;**63**(4): 473-8. doi: 10.1590/s1807-59322008000400010. [PMID: 18719757].
6. Martinsen EW. Physical activity in the prevention and treatment of anxiety and depression. *Nord J Psychiatry*. 2008; **62** (47): 25-9. doi: 10.1080/08039480802315640. [PMID: 18752115].
7. Aghamolaei T, Tavafian SS, Hassani L. Exerciseself-efficacy; exercise perceived benefits and barriers among students in Hormozgan University of Medical Sciences. *Iran J Epidemiol*. 2009; **4**(3-4): 9-15.
8. Physical Activity Guidelines for American. 2008. http://www.health.gov/paguidelines/guidelines/default.aspx/2008
9. Soltaniyan MA, Aminbeidokhti AA. The role of sport on job burnout of employees. *Koomesh* 2009; **10** (4) :281-286.
10. Karimian j, Feizi A, Javani V, Skekarchizadeh P, Torkians S. Factors Inhibiting Physical Activity among the Personnel of Isfahan Educational Hospitals Based on Leisure Time Hierarchical Model. *Health Serv Res*. 2011; **7**(4): 401-410
11. Moghimi SM. Organization and Management Approach. 9th ed. Tehran: Termeh; 2012.
12. Hazavehei MM, Sunmcadi A. Factors Contributing in Job Satisfaction in Employees of Hamedan Governmental Organizations. *Behave Sci*.2007;**5**(1):47-54.
13. Parks KM, Steelman LA. Organizational wellness programs: a meta-analysis. *J Occup Health Psychol.* 2008;**13**(1):58-68. doi: 10.1037/1076-8998.13.1.58. [PMID: 18211169].
14. Proper KI, Staal BJ, Hildebrandt VH, Van der Beek AJ, van Mechelen W. Effectiveness of physical activity programs at worksites with respect to work-related outcomes. *Scand J Work Environ Health* 2002;**28**(2):75-84. doi: 10.5271/sjweh.651. [PMID: 12019591].
15. Purgaz A, Nastiezaie N, Hezare Mogadam M. Job satisfaction of nurses working in hospitals in zahedan. *Nurse Midwifery*. 2010; **8**(3):138-143.
16. Craig CL, Marshall AL, Sjöström M, Bauman AE, Booth ML, Ainsworth BE. International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc*. 2003;**35**(8):1381-95 doi: 10.1249/01.MSS.0000078924.61453.FB. [PMID: 12900694].
17. The International Physical Activity Questionnaire: Summary Report of the Reliability & Validity Studies: Available from: http://www.ipaq.ki.se/questionnaires/IPAQSummaryReport03-01.pdf.
18. Moeini B, Jalilian F, Jalilian M, Barati M.Predicting Factors Associated with Regular Physical Activity among College Students Applying BASNEF Model.*Avicenna J Clin Med*. 2011; **18** (3): 70-76.
19. Khosravi N, Hadavi F, Farahani A. The Correlation between Physical Activity and Depression and Anxiety among High School Students in Saveh, Iran. J Sport Psychol. 2012;**1**(1):7-14.doi: 20.1001.1.23452978.1391.1.1.2.4.
20. Zabihi A, Jafarian SR, Farokhifar M, Babaee F, Salehi Omran M.T, Bijani A. Study on physical activities in Babol City. *J Babol Univ Med Sci.* 2010;**11**(6):71-76.
21. IPAQ Research Committee. Guidelines for data processing and analysis of the international physical activity questionnaire (IPQA)-short and long forms, November 2005. https://www.researchgate.net.
22. Beheshtifar M, Nekoei-Moghadam M. Relationship Between Managers' Ethical Behavior and Employees' Job Satisfaction in the Universities. *Ethics Inf Technol.* 2010;**5**(1-2):67-73.
23. Khavari L, Yousefian J. The Comparison of Job Satisfaction among Nonactive and Active Faculty Members of Yazd University. *Olympic.* 2007;**15**(1):49-59.
24. Maciel Eda S, Vilarta R, Modeneze DM, Sonati JG, Vasconcelos JS, Vilela Junior GB, et al. The relationship between physical

aspects of quality of life and extreme levels of regular physical activity in adults. *Cad Saude Publica*. 2013;**29**(11):2251-60.
25. Motefaker M, Sadrbafghi SM, Rafiee M, Bahadorzadeh L, Namayandeh SM, Karimi M, et al . SuicEpidemiology of physical activity: a population based study in Yazd cityide attempt and its relation to stressors and supportive systems: a study in Karaj city. *Tehran Univ Med J*.2008;**65**(4):77-81.
26. Ranasinghe DC, Ranasinghe P, Jayawardena R, Matthews DR, Katulanda P. Evaluation of physical activity among adults with diabetes mellitus from Sri Lanka. *Int Arch Med*. 2014 ;**7**(1):15.
27. Gharlipour Gharghani ZA, Sayarpour SM, Moeini B. Associated Factors with Regular Physical Activity among Emergency Medical Personnel in Hamadan: Applying Health Belief Model. *J Health Serv Res*. 2012;**7**(6):710-717.
28. Burton NW, Turrell G. Occupation, hours worked, and leisure-time physical activity. *Prev Med*. 2000; **31**(6): 673-81. doi: 10.1006/pmed.2000.0763. [PMID: 11133334].
29. Ransdell LB, Wells CL. Physical activity in urban white, African-American, and Mexican-American women. *Med Sci Sports Exerc.* 1998; **30**(11): 1608-15. doi: 10.1097/00005768-199811000-00009. [PMID: 9813874].
30. Evenson KR, Rosamond WD, Cai J, Diez-Roux AV, Brancati FL; Atherosclerosis Risk In Communities Study Investigators. Influence of retirement on leisure-time physical activity: the atherosclerosis risk in communities study. *Am J Epidemiol* .2002; **155**(8): 692-699. doi: 10.1093/aje/155.8.692. [PMID: 11943686].
31. Hernández B, de Haene J, Barquera S,Monterrubio E, Rivera J, Shamah T, Sepúlveda J.et al. Factors associated with physical activity among Mexican women of childbearing age. *Rev Panam Salud Publica*. 2003; **14**(4): 235-45. doi: 10.1590/s1020-49892003000900004. [PMID: 14662074].
32. Jalilian F, Emdadi Sh, Mirzaie M, Barati M. The Survey Physical Activity Status of Employed Women in Hamadan University of Medical Sciences: The Relationship Between the Benefits, Barriers, Self-Efficacy, and Stages of Change. *Toloo-e-Behdasht*. 2010; **9**(4):89-99.
33. Narimani M, Khanbabazadh M, Farzaneh S.The Study of Relationship between Personality and Job Satisfaction in Ardabil Universities'staff. *J Ardabil Univ Med Sci*. 2007;**7**(1): 77-83.
34. Asuamah SY, Kwarteng E, Amankwa J. The relationship between exercise, satisfaction and productivity among marketing students and workers of Sunyani polytechnic, Ghana. *CJSSci*. 2012; **5**(3):23-34.doi: 10.5707/cjsocsci.2012.5.3.23.34.
35. Noorbakhsh M, Ghanbari Sh. The effect of 10 weeks of physical activity on job satisfaction of university non-athlete male staff. *Ann Biol Res*. 2013;**4**(6):254-259.
36. Arslan SS, Alemdaroğlu İ, Karaduman AA, Yilmaz ÖT. The effects of physical activity on sleep quality, job satisfaction, and quality of life in office workers. *Work*. 2019 ;**63**(1):3-7. doi: 10.3233/WOR-192902. [PMID: 31033474]
37. Fang YY, Huang CY, Hsu MC. Effectiveness of a physical activity program on weight, physical fitness, occupational stress, job satisfaction and quality of life of overweight employees in high-tech industries: a randomized controlled study. *Int J Occup Saf Ergon*. 2019;**25**(4):621-9. doi: 10.1080/10803548.2018.1438839. [PMID: 29465293].
38. Calderwood C, ten Brummelhuis LL, Patel AS, Watkins T, Gabriel AS, Rosen CC. Employee Physical Activity: A Multidisciplinary Integrative Review. *J Manag Stud.* 2021; **47**(1):144-70.doi: 10.1177/0149206320940413.
39. Pour Soltani H, Mirzaei F, Zareian H. The relationship between perception of justice and job satisfaction in sport science research center of Ministry of science, research and technology's staffs. *J Sport Manag*. Summer 2011;**1**(1):59-70.
40. Gholami Fesharaki M, Mohamadian M, Aghamiri Z, Habib M, Anvari S, AzadMarzabad E. Effect of Manager Leadership Behavior and Demographical Factors on Job Satisfaction of Military Healthcare Personnel. *Mil Med*. 2013;**15**(1):39-44.