



The Social Adjustment and Depression during Outbreak of COVID-19 among Iranian People

Faezeh Zamanian^{1*}, Elham Foroozandeh²

¹ Assistant Professor of Sport management, University of Art, Tehran, Iran.

² Assistant Professor of Department of Psychology, Naein Branch, Islamic Azad University, Naein, Iran.

Received: 2 January 2021

Accepted: 23 January 2021

Abstract

Background: The sudden outbreak of Corona has created public depression and social changes, which affected countries and communities in terms of psychosocial issues. Social adjustment and physical activity play a very significant role to improve mental health. The purpose of this study was to compare social adjustment and depression during the outbreak of COVID-19 in Iranian employees regarding physical activity participation before the outbreak.

Methods: The research method was a causal-comparative type. The statistical population of the study included all men and women over the age of 25 working in governmental agencies, among which 403 people participated in the online survey by random method. The data about age, occupational, family, and educational condition were collected by demographic questionnaire. Using the short-form depression questionnaire (BDI-13), the depression during an outbreak of COVID-19 was evaluated. A 25-item social adjustment questionnaire (self-made questionnaire) was used for collecting the data of social adjustment specific to new social norms caused by COVID-19.

Results: Data analysis using ANOVA showed that active individuals had higher social adjustment than inactive individuals ($F=10.398$). Social adjustment was also statistically significant related to depression ($r=-0.165$).

Conclusions: Overall, applying physical activity with the observance of the guidelines approved by the ministry of health and other reference institutions will be a great help for the promotion of the social adjustments and mental health.

Keywords: COVID-19, Social adjustment, Physical activity, Depression.

*Corresponding to: F Zamanian, Email: faezezamanian@yahoo.com

Please cite this paper as: Zamanian F, Froozandeh E. The social adjustment and depression during outbreak of COVID-19 among Iranian people. Int J Health Stud 2021;7(1):22-27

The Coronavirus (nCoV) pandemic should be considered as the most crucial worldwide health and social events in human life in the 21st century. This pandemic is different because of the global sense of the fragility of human biological life and the demand for a “sterile society”, safe from threats.⁴ The policies are adopted by governments In this regard, are trying to expel the virus out of society. However, many of these approaches and strategies are inconsistent with the prevalent culture, customs, and social norms in society.

Development of such new social norms happened so quickly that societies have not had the opportunity to adapt to them. This issue has resulted in irrational behavior based on emotions and feelings in the general population. For example, in some countries, there have been protests to break the home quarantine. Also, many people explicitly expressed incompatibility with these new social norms. On the other hand, some people are endangering the public health, welfare, and security by hoarding hygiene items.

Hence, the lack of ability for social adjustment could potentially contribute to more severe health problems and difficulties controlling infectious diseases during an epidemic.

Coronavirus outbreak shows that a risk society leads to a vulnerable society.⁴ As the COVID-19 outbreak is ongoing, a wave of sense of depression,⁴ fear, worry,³ and distress^{5,6} in the societies has arisen which is expected the outbreak provoked panic, disrupted mental health.⁷

Human psychological characteristics vary by situational conditions and even change by critical conditions.⁸ Previous research in the field of psychology shows that people with higher social adjustment have lower psychological problems such as anxiety, loneliness, depression, and a sense of disappointment.⁹ Therefore, when individuals can adjust to the new social norms in a critical situation, they are one step closer to mental health.¹⁰ With the outbreak of the COVID-19 virus, many social norms have changed and new criteria such as keeping a distance from the elderly or people with underlying health conditions have become valuable. Therefore, in these critical and unpredictable conditions, societies for survival, health, and welfare need citizens who are able to adapt with protective criteria against COVID-19 as soon as possible. For example, individuals must respect social distancing rules and travel restrictions, control their social behaviors according to the current situation and reduce their social interactions face to

Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. People infected with the COVID-19 virus will experience common cold to severe acute respiratory illness.¹ Coronavirus (COVID-19) started rapidly spreading in December 2019 from China.² The sharp jumping of the COVID-19 outbreak from China to other countries has shocked the international community in all its dimensions such as trade, tourism industry, sporting events, and especially health policies around the world.² The sudden outbreak of Corona has elevated public anxieties and worries worldwide³ which affected countries and communities in terms of psychosocial issues.⁴

face and physically, limit public gatherings, not doing indoor physical activity in the gym and club, and so on.

In this situation, every citizen not only should satisfy their needs but also, strive to maintain his/ her composure, and adjust to the community and social changes to help stop the spread of COVID-19. Therefore, social adjustment as a personality trait is a deep concept that encompasses multiple abilities. These abilities are such as adjusting to the social criteria and social threats, the acquisition of social skills, effective and constructive communication with all people in the communities.¹¹

Studies have shown that physical activity has a significant effect on social growth and accelerating socialization¹² and is effective in the growth of social attitudes, values, and behaviors.¹³ A rich social experience, social learning and cooperation in human relationships, and social responsibility could be acquired by Physical activity participation and consequence the social-psychological skills are developed in physically active participants.¹⁴ In other words, physical activity participation improves social adjustment, social participation, socio-economic adjustment, group communication, and reduces delinquency and social dysfunction.¹⁴ The combination of these findings indicates the importance of physical activity in mental health and social adjustment.

On the other hand, people experience unpleasant feelings during times of crisis and unpredictable situations in which they need to create relaxation and comfort in their inner by applying the right mechanisms. It seems physical activity and social adjustment skills by solving problems are necessary mechanisms in this time. The process of social adjustment has occurred if individuals would be a success in applying these mechanisms to solve the problem in favor of themselves and others. In this way, individuals can create a safe and more supportive environment at home and community in the situation of the Covid-19 outbreak.

Studies show that poor social adjustment can cause anyone to feel loneliness, anxiety, and depression¹⁵ and predisposes people to social dysfunction.¹⁶ Therefore, social adjustment and physical activity play a very significant role to increase the tolerance and resilience in people during the time of stress and crisis. In other words, these two variables are positive ways to relieve unpleasant emotions such as fear, sadness, distress, depression, and disappointment and reduce complaints with new circumstance changes.

According to mentioned above, this study looked at if physical activity participation before the outbreak of COVID-19 help people adjust to changes of social criteria and manage their mental health during the Covid-19 outbreak. Then, the aim of the current research is to comparison the social adjustment and depression between people who participated in physical activity before the outbreak of Covid-19 (active people) and people who did not participate in any physical activity (inactive people).

Materials and Methods

The research method was causal-comparative type. The statistical population of the study was all men and women over

the age of 25 workings in government agencies. The electronic questionnaire was distributed across six infected provinces (Qom, Tehran, Arak, Isfahan, Rasht, and Mazandaran) on March 15, 2020, in Iran among employees in the areas of education, services, banking, executive, technical, medical and administrative via WhatsApp. The statistical sample of the study is 384 people based on Morgan's statistical table. In our study, 403 persons completed and sent out their responses, with a 79% response rate reported through the PorsLine application. The data about age, occupational, family, and educational condition were collected by demographic questionnaire. Using the short-form depression questionnaire (BDI-13), the depression during the outbreak of COVID-19 was evaluated. We design the questionnaire (SACNN) based on the literature review to assess the social adjustment specific to new social norms caused by COVID-19. To measure the validity of the content of the questionnaire, 4 faculty members of the department of psychology, 3 faculty members of the department of sociology, and 3 faculty members of the department of physical education and sports sciences who were familiar with the research topic expressed their comments and suggestions regarding the coordination and matching of questions with objectives. After revision, the final questionnaire (SACNN) was approved with 25 questions based on the Likert five-point from strongly disagree (one) to strongly agree (five), economic adjustment and Physical activity were measured by 1 question (self-evaluation) and 2 questions according to ACSM guideline¹⁷ respectively. A reliability coefficient of 0.77 was obtained.

Participation based on the amount of physical activity divided into two groups of 1) active person with physical activity ≥ 150 minutes per week before COVID-19's outbreak, and 2) inactive persons with physical activity < 150 minutes per week before COVID-19's outbreak.¹⁷ Data were analyzed using ANOVA and statistical significance was set at an alpha of $P < 0.05$. The data were analyzed using the statistical package SPSS, PC program, version 24 (SPSS Inc., USA).

Results

Table 1 presents the minimum, maximum, mean, and standard deviations of the variables in active group that is segregated by gender.

Table 2 displays the minimum, maximum, mean, and standard deviations of the variables in inactive group that is segregated by gender.

Table 3 shows the mean, standard deviations, minimum, and maximum of the variables in two groups: 1- active group (participation in physical activity before the COVID-19 outbreak), and 2- inactive group (without physical activity before the COVID-19 outbreak).

The ANOVA statistical test was used to compare the mean of variables such as age, social adjustment, economic adjustment, and depression in two groups (table 4).

Table 5 shows the relationship between social adjustment and depression that there is a negative statistically significant correlation between these two variables ($r = -0.165$, and $P < 0.001$). Therefore, increasing the level of social adjustment during the COVID-19 outbreak can be expected to reduce the amount of depression.

Table 1. Descriptive statistics in active men and women

	Gender	N	Minimum	Maximum	Mean	Std. Deviation
Age	Women	63	29	45	30.89	3.15
	Men	85	29	56	32.34	6.71
Social adjustment	Women	63	34	100	45.22	15.06
	Men	85	28	100	42.02	13.51
Depression	Women	63	7	24	16.73	4.35
	Men	85	6	23	16.64	4.21

Table 2. Descriptive statistics in inactive men and women

	Gender	N	Minimum	Maximum	Mean	Std. Deviation
Age	Women	138	28	54	30.45	3.51
	Men	117	29	56	31.51	5.63
Social adjustment	Women	138	20	102	38.12	7.80
	Men	117	13	120	40.92	12.62
Depression	Women	138	7	25	17.77	3.48
	Men	117	8	25	18.35	2.49

Table 3. Descriptive statistics of variables in active and inactive groups

Variables	Groups	N	Mean	Std. Deviation	Std. Error	Min	Max
Age	Inactive	255	30.93	4.62	.290	28	56
	Active	148	31.72	5.51	.454	29	56
	Total	403	31.22	4.98	.248	28	56
Social adjustment	Inactive	255	39.41	10.37	.650	13	120
	Active	148	43.39	14.23	1.170	28	100
	Total	403	40.87	12.07	.601	13	120
Economic adjustment	Inactive	255	2.64	1.16	.073	1	5
	Active	148	2.74	1.33	.109	1	5
	Total	403	2.68	1.23	.061	1	5
Depression	Inactive	255	18.04	3.08	.193	7	25
	Active	148	16.68	4.26	.350	6	24
	Total	403	17.54	3.61	.180	6	25

Table 4. ANOVA for comparison of the means of variables in two active and inactive groups

		Sum of squares	Df	Mean square	F	Sig.
Age	Between groups	58.36	1	58.36	2.360	.125
	Within groups	9915.95	401	24.72		
	Total	9974.31	402			
Social adjustment	Between groups	1481.39	1	1481.39	10.398	.001
	Within groups	57132.63	401	142.47		
	Total	58614.03	402			
Economic adjustment	Between groups	.93	1	.93	.620	.431
	Within groups	606.76	401	1.51		
	Total	607.70	402			
Depression	Between groups	173.11	1	173.11	13.667	.000
	Within groups	5079.11	401	12.66		
	Total	5252.22	402			

Table 5. Correlation of depression and social adjustment

	population		Depression	Social adjustment
Total		Pearson correlation	1	-.165**
		Sig. (2-tailed)		.001
		N	403	403
Depression	Women	Pearson correlation	1	-.174*
		Sig. (2-tailed)		.014
		N	201	201
Men	Men	Pearson correlation	1	-.162*
		Sig. (2-tailed)		.021
		N	202	202

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Discussion

The social crisis of Covid-19 in lives and work causes psychological problems to the general public.^{18,7,5,19} Researchers suggested the need for a new interdisciplinary approach with the cooperation of sociologists, philosophers, anthropologists as well as virologists, epidemiologists, and public health experts to have a change both in our behavior to the environment and in our actions in facing a crisis.⁴

The virus control problems and the extension of new social norms such as quarantine, avoid holding meetings and maintain distances in the community create a wave of social depression worldwide. One of the factors promoting mental health is social adjustment.¹⁰ Therefore, since physical activity has positive effects on mental health and social adjustment, this study was conducted to investigate the relationship between social adjustment and depression during the Coronavirus outbreak regarding physical activity participation of Iranian people.

This study showed that the people who participated in physical activity before the COVID-19 outbreak have a significantly higher social adjustment (SACNN) than inactive peers.

These findings are consistent with the results of Nasiri's (2015)²⁰ research. It has been shown that people's participation in physical activity affects improving the level of individuals' social adjustment. Researchers showed that physical activity and sport participation increase social skills.²¹ In this regard, Narimani (2006) and Yaghouti (2000) believe in the role of sports in socialization and showed that athletes are more sociable than non-athletes.¹² The results of Govindappa and Bujurke (2019) showed that physically active people have significantly more social adjustment and emotional adjustment than people who are not physically active.²²

In general, one of the dimensions of social growth is a social adjustment, which is enhanced by regular and continuous physical activity. Therefore, one of the reasons for the difference in social adjustment between active and inactive people is related to the characteristics of regular physical activity, which emphasizes social growth and adjustment with the social environment and improve the personal growth.²³ Thus, personal growth affects the growth of social attitudes, values, and behaviors²³ and prepares the person to accept social and civic responsibilities.

Physical activity, which is performed under certain conditions, rules, and regulation has a significant effective role in social growth.¹² In the process of socialization, humans learn a range of social skills to develop their adaptive behaviors with social criteria. As well, participation in physical activity, and consequently the promotion of social adjustment, can affect situational factors such as socio-cultural, environmental, and personal factors.²⁴ Therefore, people who have participated in regular physical activity before the outbreak of the coronavirus have displayed better skills to manage adaptive social behaviors to the norms that set at this period of the outbreak. They gradually modify and adjust their behavior intentionally or unintentionally to adapt to the emerging culture of COVID-19.

Social adjustment was significantly associated with depression. This means that people who had higher social adjustment respond with fewer depressions to COVID-19.

Social adjustment has been reported as the most important factor of mental health and there was a positive relationship between students' psychological resilience and social adjustment.²⁵ People with higher social adjustment have fewer anti-social tendencies.²⁶ They respond appropriately to the new social norms in critical situations and set the basis of their behaviors based on coordination with new social criteria. Therefore, these individuals can predict others' behavior in stressful situations and react correctly to them. They can control their behavior to adapt to situational conditions, regulate their social connection, and maintain their social networks. They try as much as possible to keep their daily routines or create new routines if circumstances change. If health authorities have recommended limiting the physical social contact to contain outbreak, they can stay connected via telephone, e-mail, social media or video conference, as WHO recommended during the COVID-19 pandemic.¹ Then, they respect the new rules and human rights and avoid any tension and worry. People who have highly social adjustment can define the right ways to cope with the crisis of society and have a high degree of adaptability. These social skills help them to overcome negative emotions such as disappointment, depression, sadness and worry.⁹ Some researchers also consider social adjustment equal to social skills.²⁷ In their view, social skills are the ability to interact with others in a particular social context, in a way that is acceptable and valuable in society.²⁷

On the other hand, these people can pay attention to their needs and feelings during times of stress. They can do healthy activities that they enjoy at home and find relaxing. Therefore, during the outbreak of COVID-19, people with high social adjustment have higher social skills in managing their abilities for adaptation with new criteria, new social patterns, and threats, as well as effective and constructive communication concerning rules of health and without creating any tension and worry among individuals. This adaptation helps people overcome the existing social crisis and handle the depression caused by the coronavirus (COVID-19), and feel safe and secure from the crisis.

The feeling of depression during the outbreak of coronavirus (Covid-19) in active people was significantly lower than inactive peers.

Studies have shown that physical activity is associated with vitality, freshness, and mental health. Inactive people are more prone to sickness, loneliness, disappointment, depression, along with poor health and immune system in stressful situations. It is consistent with the findings of some researches²⁸⁻³⁰ on the effect of physical activity on reducing stress and increase mental health. Physical activity has many psychological effects, including reducing anxiety, depression, and disappointment, coping with stress, improving mood, and mental health. Promoting health behaviors and habits, such as regular physical activity, reduce the risk of psychological and physical disorders, and increase mental health.³¹ Although in many studies the efficacy of exercise to reduce symptoms of

depression have been examined, but the mechanisms underlying the antidepressant effects of exercise remain unclear. The thermogenic hypothesis (a rise in core body temperature following exercise is responsible for the reduction in symptoms of depression), the endorphin hypothesis (antidepressant effects due to increased release of β -endorphins following exercise), the monoamine hypothesis (an increase in the availability of brain neurotransmitters which are diminished with depression e.g., serotonin, dopamine, and norepinephrine), the distraction hypothesis (coping with depression and management of depression), and the enhancement of self-efficacy are credible physiologic and psychological mechanisms that have been described about the antidepressant effects of exercise.^{32,33}

Generally, Human societies need moderators and interventions to accelerate and facilitate the process of social adjustment, participating in problem-solving, accepting social responsibility, social norms, and values that have been reversed in crises situations such as the outbreak of the COVID-19. Physical activity and sports participation are considered a multidimensional phenomenon with different functions that are related to mental health and socio-psychological variables.³⁴ Therefore, it is suggested to use physical activity to improve the social adjustment in these crisis conditions caused by COVID-19 and also to promote the mental health status of the society. To achieve this goal, it is needed to design new protocols to engage in physical activity during the pandemic of COVID-19. Applying physical activity with the observance of the guidelines approved by the ministry of health and other reference institutions will be a great help for the growth and promotion the social adjustments.

However, coping with the outbreak of the COVID-19 has become part of normal life and daily activities, and even a successful transition from it will not guarantee the coming back this outbreak or starting a new outbreak.

This study suggests future researches need to contribute behavior sciences to examine the other mechanism to keep and enhance social adjustment in the communities under crisis and stress conditions.

Acknowledgement

We appreciate Dr Majid vesali Naseh & Dr Mina Haghighi for their assistances in this research. The CRT code of this article is UMIN000042919.

Conflict of Interest

The authors declare that they have no conflict of interest.

References

- Organization WH. Coronavirus disease 2019 (COVID-19), Situational Report 35. Data as reported by 10 AM CET 24 February 2020.
- Hua J, Shaw R. Corona Virus (COVID-19) "Infodemic" and emerging issues through a data lens: the case of China. *International Journal of Environmental Research and Public Health* 2020;17:1-12. doi:10.3390/ijerph17072309
- Lin CY. Social reaction toward the 2019 novel coronavirus (COVID-19). *Social Health and Behavior* 2020;3:1-2. doi:10.4103/SHB.SHB_11_20
- Sadati AK, B Lankarani MH, Bagheri Lankarani K. Risk society, global vulnerability and fragile resilience; sociological view on the coronavirus outbreak, Shiraz E-Med J. Online ahead of Print 2020;21:e102263. doi:10.5812/semj.102263
- Zhang SX, Wang Y, Rauch A, Wei F. Unprecedented disruptions of lives and work: Health, distress and life satisfaction of working adults in China one month into the COVID-19 outbreak. *Psychiatry Research*; published online March 30. 2020;288:112958. doi:10.1016/j.psychres.2020.112958
- Afshar Jahanshahi A, Mokhtari Dinani M, Nazarian Madavani A, Li J, Zhang SX. The distress of Iranian adults during the Covid-19 pandemic – More distressed than the Chinese and with different predictors, *Brain, Behavior, and Immunity*, 2020. doi:10.1016/j.bbi.2020.04.081
- Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: address mental health care to empower society. *Lancet* 2020;395:E37-8. doi:10.1016/S0140-6736(20)30309-3
- Seok B. Embodied Moral and Psychology and Confucian Philosophy. Chapter 5: Character or Situation? 2013. *Situated Confucian Virtue*. eBook. Lexington Books. United Kingdom.
- Ghanbarzadeh N, Mehrani Z, Sharifzadeh Gh, Nadjafi-Semnani A, Nadjafi-Semnani M. Investigating the relationship between moral intelligence, social adjustment and postpartum depression in women referring to Birjand health centers. *Ibne Sina Scientific Research Quarterly / Nahaja Health, Relief and Treatment Department* 2020;21:100-4. [Persian].
- Van Den Berg AE, Koole SL, Wulp NY. Environmental preference and restoration: (how) are they related. *Journal of Environmental Psychology* 2003;23:135-46. doi:10.1016/S0272-4944(02)00111-1
- Taghinezhad Z, Eghlima M, Arshi M, Pourhossein Hendabad P. Effectiveness of social skills training on socialadjustment of elderly people. *Archives of Rehabilitation* 2017;18:230-41. doi:10.21859/jrehab-1803230
- Rezaei Kargar F, Heydari M, Ajilchi B, Shomali Oskooi A. The effect of exercise on social adjustment and self-esteem of high school female students. *Second Iranian Congress of Social Psychology* 2014;2:855-60. [Persian].
- Bartolomeo GD, Papa S. The effects of physical activity on social interactions: the case of trust and trustworthiness. *Journal of Sports Economics* 2019;20:50-71. doi:10.1177/1527002517717299
- Rezvandoost MH. Investigating the impact of sports activities on the social behavior of high school students in Arak City in 2012. M.Sc. Thesis. University of Tehran 2014. [Persian].
- Mounts NS, Valentiner DP, Anderson KL, Boswell MK. Shyness, sociability, and parental support for the college transition: relation to adolescents' adjustment. *Journal of Youth and Adolescence* 2006;35:68-77. doi:10.1007/s10964-005-9002-9
- Kupferberg A, Bicks L, Hasler G. Social functioning in major depressive disorder. *Neuroscience and Biobehavioral Reviews* 2016;69:313-32. doi:10.1016/j.neubiorev.2016.07.002
- Pescatello LS, Arena R, Riebe D, Thompson PD. ACSM's guidelines for exercise testing and prescription. 2014. 9th ed. Lippincott Williams & Wilkins.
- Xiang Y-T, Yang Y, Li W, Zhang Q, Cheung T, Ng CH. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry* 2020;7:228-9. doi:10.1016/S2215-0366(20)30046-8
- Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. *SSRN Electron Journal* 2020 doi:10.2139/ssrn.3541120
- Nasiri Z. The effect of sports participation on the social adjustment of female students. Iran's first national conference on sports science and physical education. Tehran COI Cod: Sportconf01-028 2015. [Persian].
- Parsa M, Niknezhad MR, Rasoolinezhad SP. The Study of relationship between physical activity and social health of Talesh citizens. *Quarterly Journal of Sports Management and Development* 2018;6:175-89. [Persian]. doi:10.22124/jsm.2018.2723
- Govindappa KS, Bujurke AG. Occupational stress in relation to adjustment of sports and non-sports personnel. *International Journal of Physiology, Nutrition and Physical Education* 2019;4:197-9.
- Hassanzadeh F. Investigating the relationship between exercise and social adjustment and the level of self-confidence of high school girls. Master Thesis. Faculty of Education and Psychology 2004. [Persian].
- Kerketta I, Gangey O. Comparative study of social adjustment of male and female players. *Indian Journal of Physical Education of Physical Education, Sport and Applied Sciences* 2016;6:26-9.

25. Aghayousefi A, Zare H, Pourbaferani S. A study of relationship between egocentrism and social adjustment. *Social Cognition* 2015;141-52. [Persian].
26. Parsamehr M, Heddat E. The relationship between emotional intelligence and social adjustment of students. *Quarterly Journal of Social Development (Previously Human Development)* 2016;11:65-94. doi:10.22055/QJSD.2017.12684. [Persian].
27. Khodayarifard M, Rahiminezhad A, Abedini Y. Investigating the factors affecting the social adjustment of Shahed and non-Shahed students. *Research Project of the Institute of Psychology and Educational Sciences* 2007;26:25-42. [Persian].
28. Sanaei M, Zardoshtian S, Noruzi Seyed Hoseini R. The effect of physical activities on quality of life and hop life in older adults of Mazandaran province. *Sports Management Review* 2013;10:137-57.
29. Yen IH, Michael YL, Perdue L. Neighborhood environment in studies of health of older adults: a systematic review. *American Journal of Preventive Medicine* 2009;37:455-63. doi:10.1016/j.amepre.2009.06.022
30. Muangpaisan W, Assantachai P, Intalapaporn S, et al. Health expectancies in the older Thai population. *Archives of Gerontology and Geriatrics* 2011;53:3-7. doi:10.1016/j.archger.2010.05.012
31. Naghibzadeh SM, Malekshahi H, Rshnavadi-Nejad J. Relationship between physical fitness and general health among female students of Ilam university. *Journal of Ilam University of Medical Sciences* 2014;22:59-66.
32. Choi KW, Zheutlin AB, Karlson RA, et al. Physical activity offsets genetic risk for incident depression assessed via electronic health records in a biobank cohort study. *Depression and anxiety* 2020;37:106-14. doi:10.1002/da.22967
33. Craft LL, Perna FM. The benefits of exercise for the clinically depressed. *Primary Care Companion to the Journal of Clinical Psychiatry* 2004;6:104-11. doi:10.4088/pcc.v06n0301
34. Khazaei A, Eghbali B, Dabir AB, Mahmoudi A. The role of psychosocial factors in predicting physical activity of students. *Sport Psychology Studies* 2020;8:189-204. [Persian].