

## Effectiveness of Exercise Activity on Mental Health, Depression and Life Expectancy of Improved Addicts

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### Abstract

**Introduction:** Drug abuse can affect the mental, physical and social health of individuals. In this regard, the purpose of this study was to investigate the effect of exercise activity on mental health, depression and life expectancy of improved addicts.

**Methods:** 86 patients from Jahrom City, who had stopped at least one year taking any drugs were voluntarily selected and divided into active (n=34) (Mean  $\pm$  SD; aged: 36.44  $\pm$  9.91 yrs., height: 177.55  $\pm$  6.96 cm., weight: 79.63  $\pm$  7.60 kg) and inactive (n=52) (Mean  $\pm$  SD; aged: 39.22  $\pm$  9.24 yrs., height: 173.54  $\pm$  8.05 cm., weight: 76.98  $\pm$  10.77kg) groups. General health questionnaire (GHQ) and Pittsburgh sleep quality index (PSQI) were used for data collection. Data analysis was done by U Mann Whitney test were using SPSS 18 software ( $p \leq 0.05$ ).

**Results:** The results showed that the mean mental health of the active group was significantly lower than the inactive group ( $p = 0.008$ ). Additionally, the active group was significantly less depressed than its inactive counterparts ( $p = 0.001$ ). Furthermore, the active group had a higher life expectancy than the inactive group, although this difference was not statistically significant ( $p = 0.36$ ).

**Conclusion:** According to the results of the study, active improved addicts had a better status in mental health, depression and life expectancy than inactive people.

**Keywords:** Addicts, Mental Health, Depression, Life Expectancy, Physical Activity

### Introduction

Today, drug abuse has become a global issue, calling it one of the four crises of age (the crisis of the threat of a nuclear bomb, the crisis of environmental degradation, the crisis of poverty and the addiction crisis) (1, 2). Consumption of drugs destroys millions of lives and threatens the order and security of the community, and also destroys national capital at macro-level (in order to prevent or compensate for damage) (3). Given the proximity of the two drug-producing countries (Afghanistan and Pakistan), it is unexpected that our country will not suffer from this ill-fated illness (4, 5). The UN's estimate up to 2008 showed that there are 220 million addicts

in the world. Also, the statistics of the Government of the Islamic Republic of Iran in 2006 indicate that there are 367100 addicts in Iran (2). In general, addiction can be considered to be drug dependence, which affects the individual physically and psychologically and controls all his social and individual behaviors (6). Drug abuse can endanger the health of individuals. Research suggests that symptoms such as decreased quality of life and satisfaction with life, reduced mental health, increased depression and anxiety, sleep disturbances, cognitive and emotional disturbances, and social relations impairment are among common outcomes during drug abuse as well as the withdrawal

period (7- 10). Addiction not only affects the mental health of the individual but also the mental health of other members of the family (11). Almost half of people with addiction disorders are simultaneously having psychiatric disorders such as depression (1). Depression occurs while taking or abandoning the substance. On the other hand, depression itself can increase the risk of addiction (7, 9-12). In this regard, a significant relationship between depression and addiction has been reported (13, 14). In the case of life expectancy, Snyder and Lopez suggested that people with low hopes are more likely to have tendency to drugs because they find it difficult to find a way to reach their goals and have no incentive to achieve their goals (15). Given the high vulnerability of psychiatric addicts, it is necessary to take steps to improve their mental health. To this end, research shows that through exercise, their mental health, depression and life expectancy can be improved (16- 18); also exercise has the potential to be the most effective way to treat addiction (19). The results of a study showed that there is a significant correlation between the overall score of physical activity and the component of exercise with general health (20). Another study on employees also confirmed the positive effect of exercise on mental health (21). In the case of depression, a study on hemophilia patients showed that after eight weeks of training in water, a significant improvement in depression was found (22). Also, Tahmasebi *et al.*, and Motaghi *et al.* confirmed the positive relationship between exercise and depression (23, 24). The result of a study showed that exercise can improve life expectancy (18). Other studies have also reported that sports activities can promote life expectancy (25, 26). In our studies, we did not find any study on improved addicts. Accordingly, the aim of this study was to investigate the effectiveness of sports activities on mental health, depression and life expectancy of addicts.

## Methods

Eighty six patients from Jahrom city, who had stopped at least one year taking any drugs were voluntarily selected and divided into active (n= 34) and inactive (n= 52) groups. Initially, a letter was sent to the welfare organization of Jahrom city. The organization then introduced the researchers with coordinators and organizers of NA meetings. In collaboration with these people, they were present at NA meetings for 2 weeks and samples were found. After voluntarily selecting the subjects and describing the purpose and method of conducting the research, the subjects entered the study. First, they completed all informed consent and demographic information forms. They were assured that all information would remain confidential and would be used only to complete this scientific study. Of the subjects, those who had at least three sessions per week of physical activity were selected as the active group and those who did not have any activity were selected as inactive. Subsequently, the subjects completed the questionnaires. It should be noted that all questionnaires were completed individually and with full supervision. Data collection instruments included general health questionnaire (GHQ), depression inventory (Beck) and Schneider's life expectancy questionnaire. General Health Questionnaire (GHQ- 28) contains 28 questions that examine 4 subscales of physical syndrome, anxiety and insomnia syndrome, social dysfunction syndrome and depression syndrome (27). To measure the general health of the subjects, the 4-point Likert scale was used, which is set from the lowest to the highest and with scores (0, 1, 2, and 3). The total score earned by a person varies from zero to 84. In this method, the sum of scores lower, indicates better general health and high scores reflect disorder (16). Ebrahimi *et al.*, reported Cronbach's alpha for questionnaire to be 0.97 (27). The Beck depression questionnaire was used to measure depression, which is the most

appropriate instrument for measuring depression. There are 21 questions in this questionnaire with 4 options, which we score from zero to 3, respectively. The total score is obtained from the sum of the selected option scores. Degrees of depression are: 0- 9 points for the degree of depression, 10- 16 % mild depression, 17- 28 medium depression, 29- 30 severe depression (28). Schneider's life expectancy questionnaire has been developed to measure life expectancy. of the 12 statements, four phrases are developed to measure factor thinking, four phrases measure strategic thinking and four terms are deviating (29). The method of scoring it is based on the 5-range Likert scale. In order to obtain the overall score of the questionnaire, the total points of each question are calculated together. Higher scores will indicate a greater life expectancy in the respondent, and vice versa. Its validity is 0.80 and the reliability is reported to be 0.50 to 0.60. (30). Mean and standard deviation were used for descriptive statistics and U Mann Whitney test was used for inferential statistics, in which the significance level was  $P \leq 0.05$ . All data analysis was done using SPSS software version 21.

## Results

The characteristics of the subjects are shown in Table 1. Also, the study of normal distribution of data using Kalmogorov-Smirnov test showed that the data of this study have a natural distribution. The results of U Mann-Whitney test on the overall score of mental health of the active and inactive addicts in Table 2 show that there is a significant difference between the mental health of active and inactive people ( $p= 0.008$ ), so that active improved addicts have a significantly better mental health status than their inactive counterparts. In terms of life expectancy, the results showed that there was no significant difference between the life expectancy of active and inactive addicts ( $p= 0.36$ ). Also, the results showed that there was a significant difference between the level of depression of active and inactive addicts ( $p= 0.001$ ). Inactive improved addicts are significantly more depressed than their active counterparts. In addition, the percentage of depression in both active and inactive addicts is shown in Table 3.

**Table1.** Demographic characteristics of active and inactive addicts (mean  $\pm$  standard deviation)

Variable	Group	
	Active	Inactive
Age (Year)	36.44 $\pm$ 9.91	39.22 $\pm$ 9.24
Weight (Kg)	79.63 $\pm$ 7.60	76.98 $\pm$ 10.77
Height (Cm)	177.55 $\pm$ 6.96	173.54 $\pm$ 8.05

**Table2.** U Mann-Whitney test results on the level of mental health, life expectancy and depression of active and inactive addicts

Variable	Group	Mean $\pm$ SD	Z	P
Mental Health	Active	10.05 $\pm$ 8.12	-3.62	0.001*
	Inactive	18.60 $\pm$ 12.11		
Life Expectancy	Active	42.13 $\pm$ 7.82	-1.21	0.22
	Inactive	40.16 $\pm$ 7.78		
Depression	Active	4.25 $\pm$ 3.41	-5.42	0.001*
	Inactive	13.22 $\pm$ 9.05		

\* shows a significant difference between the two means

**Table 3.** Percentage of the type of depression of and active and inactive improved addicts

Group	Severe Depression	Moderate Depression	Mild Depression	No Depression
Active Addicts	% 82.35	% 5.88	% 11.76	% 0.00
Inactive Addicts	% 46.15	% 23.07	% 23.07	% 7.69

## Discussion

The purpose of this study was to investigate the effect of exercise activity on mental health, depression and life expectancy of improved addicts. The findings of the present study indicate that active improved addicts have significantly better mental health than their inactive counterparts. The results of some studies are in line with this finding. As an example, Arab Ameri *et al.* (2014), conducted a study on the effect of physical activity in water and drought on general health and some factors of physical fitness that affect the balance of elderly women. Their results showed that performing exercise protocol in water would increase general health (31). In the study of Kashfi *et al.* (2013), the role of sport activity and gender in mental health of the staff of the Red Crescent (*Helal-e-ahmar*) population was studied. Their results indicated that the mental health of athlete women and men was significantly higher than that of non-athlete's group of the same sex (21). The findings of Mousavi Rad and Keshavarz (2015) also confirm the significant relationship between exercise and mental health (32). In another study by Tofighi *et al.* (2014), it was found that physical activity contributes to an increase in the general health of students (20). Soltani *et al.* And Ramezani Nejad *et al.* reported that sport activity has significantly increased the general health level, which is consistent with the present study (16, 33). However, the study of Anbari *et al.* (2012) does not match this finding (34). They conducted a study on the effect of the eight-week general sport model on physical fitness and general health of male employees. Their results indicated that there was no significant relationship between exercise and general

health. The reason for this inconsistency can be the difference in the type of statistical population and the amount of exercise. In the study of Anbari *et al.*, the staff were used as a statistical sample. Also, their subjects performed sports activities in an interventional manner for only eight weeks, while in the present study, people who were continuously engaged in sports activities were used. In addition, the research findings show that sport activity is inversely related to depression. This means that the rate of depression in active improved addicts is significantly lower than the inactive group. The results of some studies are in line with this finding. For example, Kargarfard *et al.* (2011), in a study that aimed to examine the effects of exercise therapy in water on the quality of life, anxiety and depression in patients with hemophilia concluded that exercising in water can help to improve the quality of life, anxiety and depression in those patients (22). Zarepour *et al.* (2013) suggest that there is a significant difference between athlete and non-athlete women in terms of depression. This means that the mean score of depression in athlete's women is lower than non-athlete women (17). Hekmatipour *et al.* (2013) investigated the effect of regular exercise on depression among elderly people and concluded that there is a significant difference between the mean scores of depression in two groups of control and intervention (35). Also, Motaghi reported that there is a significant relationship between sport activity and depression (23). According to Hekmatipour *et al.*, in a study by Donohue (2004), active students are more likely to experience impulsivity and psychosis compared to their inactive counterparts. This finding is not consistent with the findings of

this study. This inconsistency can be due to cultural differences, age group and type of statistical population (35). It was also found that active improved addicts had a higher life expectancy than the inactive group, but this finding was not statistically significant. According to Sanai *et al.* the result of the study by Christiane *et al.* (2007) is consistent with the finding of this research. In their study, there was no significant relationship between physical activity and life expectancy (18). But the results of most studies confirm the positive and significant effect of exercise on life expectancy. A study showed that if physical inactivity is eliminated from society, life expectancy in the world is increased by 0.68 years (25). Another study reported that a group of subjects with at least 15 minutes of physical activity had a longer life expectancy of 3 years than the inactive group. In other words, this study showed that physical activity increases life expectancy (36). In addition, another study suggests that people who have even a low physical activity have a higher life expectancy than normal people (26). Findings from a study in Brazil show that eliminating the state of physical inactivity and initiating activities in individuals increases life expectancy by 0.31 years (37). In Iran, Sanai *et al.* (2013) studied the effect of physical activity on the quality of life and life expectancy of elderly people in Mazandaran province. Their findings also indicate a significant effect of physical activity on the amount of life expectancy (18). Studies show that body and mind interact with each other. Considering the direct relationship between the body's health and mental health, in order to explain the results, physiological functions and social functions of sports activities can be mentioned. Physiological activity of the exercise can lead to certain changes; for example, reducing cardiovascular responses to physical stress may be associated with a reduction in the response to emotional stress, which ultimately reduces mental disorders in response to such stresses (21). Together with exercise, the levels of serotonin

(effective hormone in mood regeneration) and endorphins (natural pain relief medications) are increased, which also reduce depression (17). Sports activities also have the potential to help improve some fitness factors, reduce BMI, reduce cholesterol and triglyceride, and improve some cardiovascular diseases, such as systolic and diastolic blood pressure (38, 39). People engaged in sports activities engage in social relationships and, as a result, get out of seclusion and isolation, which can help reduce depression and increase mental health. Exercise also reveals mental talents, and individuals can overcome their social problems and develop indicators such as mood, confidence, self-esteem, sociability, and social adjustment (40, 41). In addition, sports participation can bring a person with higher levels of satisfaction with life and happiness (42, 43).

### Conclusion

According to the results of the research, it seems that exercise and physical activity can increase the mental health and reduce the depression of improved addicts; therefore, considering the effectiveness of exercise on mental health and depression, it is suggested to institutionalize exercise and increase and improve the sports facilities in order to increase the mental health and reduce the depression of improved addicts. This can lead to their faster returns to society, which ultimately increases the health of the community.

### Ethical issues

No applicable.

### Authors' contributions

All authors equally contributed to the writing and revision of this paper.

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## References

- Haydari J, Jafari H, Hosseini SH, Janati Y, Mohammadpour RA, Ghahramani M. Study on the psychosocial conditions of addicts in Sari township in 2004. *J Mazandaran Univ Med Sci.* 2006; 16 (52): 109- 117.
- Habibi R, Talaei A, Ebrahimzadeh S, Moneghi Karimi H. The effect of family-centered problem solving teaching method upon the self esteem in drug- dependent clients. *Mashhad Univ Med Sci J.* 2012; 55 (1): 52- 59.
- Jalilian F, Mirzaei Alavijeh M, Amoei MR, Zinat Motlagh F, Hatamzadeh N, Allahverdi-pour H. Prevalence and pattern of drug abuse among prisoners in Kermanshah city. *Iran J Health Educ Health Promot.* 2013; 1 (2): 41- 48.
- Amani F, Sadeghieh S, Salamati P. Characteristics of self introduced addicts in Ardebil. *J Payesh.* 2005; 4 (1): 55- 59.
- Sadeghi N, Davari E, Ziaei-brad M, Ghoddoosi A. Quality of life and its relation to background characteristics and relationships in the family in adolescents and young people referring to addiction treatment centers. *Iran J Social Health.* 2015; 15 (57): 57- 72.
- Shirsavar MH, Amirtash AM, Jalali S, Koshan M, Keyvanloo F, SeyyedAhmadi M. Comparing the effectiveness of rehabilitation methods with and without exercise on quality of life and self-esteem addicts Quarterly. *J Sabzevar Univ Med Sci.* 2013; 20 (3): 292- 301.
- Hojjati H, Aloustani S, Akhondzadeh G, Heidari B, Sharif\_Nia H. Study of mental health and its relation with quality of life in addicts. *SSUJ.* 2010; 18 (3): 207- 214.
- Efati M, Kafie Masole M, Delazar R. The study of mental health and its relationship with quality of life in substance dependents. *J Res Addict.* 2012; 6 (22): 55- 64.
- Kazemiyan S, Delavar A. Effectiveness of life review therapy on general health improvement in addicts voluntarily seeking therapy. *J Clin Psychol.* 2012; 1 (5): 75- 90.
- Hejazi M, Sobhi A, Sadeghi Jahan A. Efficacy of life skills training on reducing anxiety and depression in drug dependent subjects. *ZUMS.* 2016; 24 (104): 20- 28.
- Mancheri H, Sharifi Neyestanak ND, Seyedfatemi N, Heydari M, Ghodoosi M. Psychosocial problems of families living with an addicted family member. *IJN.* 2013; 26 (83): 48- 56.
- Amiri M. Depression is one of the most common psychological disorders that comorbid with substance use disorders. *Res Addict.* 2009; 3 (9): 101- 114.
- Prusakowski MK, Shofer FS, Rhodes KV, Mills AM. Effect of depression and psychosocial stressors on cessation self-efficacy in mothers who smoke. *Matern Child Health J.* 2011; 15 (5): 620- 626.
- Statham DJ, Connor JP, Kavanagh DJ, Feeney G, Young RD, May J, et al. Measuring alcohol craving: development of the alcohol craving experience questionnaire. *Addict J.* 2011; 106 (7): 1230- 1238.
- Shahmoradi A, ali Mohammadifar M, Khazem Fakhri M. The effect of methadone maintenance treatment on health psyche and having hope in drug addicted persons. *Res Addict.* 2011; 4 (16): 73- 84.
- Ramazani Negad R, Niazi SM, Hematinezhad M. Comparing general health between participated people in sport activity and inactive people quarterly. *J Sport Sci.* 2010; 2 (4): 49- 66.
- Zarepoor F, Kamali M, Alagheband M, Gheisari M, Sarlak S. Evaluation of depression and its relationship to exercise in women over 20 years. *Shahid Sadoughi Univ Med Sci J.* 2012; 20 (1): 64- 72.
- Zardoshtian S, Norouzi R. The effect of physical activity on quality of life and life

- expectancy In the elderly Fars province. *JSM*. 2014; 5 (17): 137- 157.
19. Kazemi A, Mahdavinejad R, Ghasemi G, Sadeghi M. Effects of an 8-week exercise with Physioball on the correction of thoracic kyphosis, balance and quality of life in addicted men after quitting drugs. *JRSR*. 2013; 9 (2): 328- 337.
20. Tofighi A, Babaei S, Eloon Kashkuli F, Babaei R. The relationship between the amount of physical activity and general health in Urmia medical university students. *Urmia Nurs Midwifery Fac J*. 2014; 12 (3): 166- 172.
21. Kashefi M, Arab Ameri E, Davoud H. The relationship between exercise and gender in mental health of staff of red crescent society of tehran. *Sci J Rescue Relief*. 2014; 5 (4): 46- 54.
22. Kargarfard M, Dehghani M, Heidari A. Effect of a period of aquatic exercise therapy on the quality of life, anxiety and depression in patients with hemophilia. *Koomesh J*. 2011; 12 (4): 364- 367.
23. Motaghi M. The effect of physical exercise on mild postpartum depression and related factors among women referring to kashan health centers, 2011. *Urmia Nurs Midwifery Fac J*. 2013; 11 (5): 363- 368.
24. Tahmasebi A, Zarshenas S, Houshvar P, Karimian J, Shekarchizadeh P. The effect of endurance exercises on occupational performance areas and the depression severity of students in isfahan university of medical sciences. *JRRS*. 2013; 9 (3): 480- 489.
25. Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT, et al. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet*. 2012; 380 (9838): 219- 229.
26. Moore SC, Patel AV, Matthews CE, de Gonzalez AB, Park Y, Katki HA, et al. Leisure time physical activity of moderate to vigorous intensity and mortality: a large pooled cohort analysis. *PLoS Med*. 2012; 9 (11): e1001335.
27. Ebrahimi A, Molavi H, Moosavi G, Bornamanesh A, Yaghobi M. Psychometric properties and factor structure of general health questionnaire 28 (GHQ- 28) in iranian psychiatric patients. *Res Behav Sci J*. 2007; 5 (1): 5- 12.
28. Zarepoor F, Kamali M, Alagheband M, Gheisari M, Sarlak S. Evaluation of depression and its relationship to exercise in women over 20 years. *SSUJ*. 2012; 20 (1): 64- 72.
29. Khaledian M, Gharibi H, Gholizadeh Z, Shakeri R. The impact of group cognitive behavioral therapy (CBT) on depression decrease and hopefulness increase of empty nest syndrome. *J Family Counsel Psycho*. 2013; 3 (2): 261- 279.
30. Khaledian M, Mohammadifar MA. On the effectiveness of group cognitive- behavioral therapy and logotherapy in reducing depression and increasing life expectancy in drug addicts. *J Res Addict*. 2016; 9 (39): 63- 80.
31. Arabameri E, Taheri M, Irani K. The effect of water-based exercise programs and KSD protocol on general health questionnaire and optimal physical fitness factors affecting female elders balance. *J Motor Behav*. 2014; 6 (16): 15- 28.
32. Moosavirad S, Keshavarz L. Relation of between how leisure and mental health teachers athletes and non-athlet shahin shahr city. *J Organ Behav Managem Spor Studi*. 2015; 2 (6): 73- 80.
33. Soltani Shal R, Aghamohammadian S, GHanaei CA. Effect of exercise on general health, quality of sleep and quality of life in ferdowsi university of mashhad students. *Qazvin Univ Med Sci J*. 2013; 17 (4): 39- 46.
34. Anbari S, Moghadasi M, Torkfar A, Rahimezadeh E, Khademi Y. The effects of the recommended eight- weeks sports-for- all program on physical fitness and general health of male employees. *Armaghanedanesh J*. 2012; 17 (1): 40- 49.

35. Hekmati Pour N, Hojjati H, Sharif Nia H, Akhondzade G, Nikjou AR, MirAbolhasani M. Effect of exercise on depression in elderly. *Iran J Health Educ Health Promot.* 2013; 1 (3): 23- 32.
36. Wen CP, Wai JPM, Tsai MK, Yang YC, Cheng TYD, Lee M-C, et al. Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. *Lancet.* 2011; 378 (9798): 1244- 1253.
37. de Rezende LFM, Rabacow FM, Viscondi JYK, Luiz OdC, Matsudo VKR, Lee I-M. Effect of physical inactivity on major noncommunicable diseases and life expectancy in brazil. *JPAH.* 2015; 12 (3): 299-306.
38. Nourshahi M, Rahmani H, Zahedi H, Rajaeyan A. Correlation of mountaineering with cardiovascular and physical health in the elderly. *Iranian J Ageing.* 2009; 4 (3): 43- 56.
39. Rahmani Ghobadi M, Hoseini R. The relationship of physical activity and risk factors of coronary heart disease (CHD) in older men. *Salmand J.* 2015; 9 (4): 316- 323.
40. Pronk NP, Crouse SF, Rohack JJ. Maximal exercise and acute mood response in women. *Physiol Behav.* 1995; 57 (1): 1- 4.
41. Shahivandi A, Masoud M, Soltani T, Soltani M. The role of planning and tailoring of urban sport facilities in increasing physical activity and community participation a case study of arak city's citizens with hearing and motor disabilities. *MEJDS.* 2014; 4 (1): 50-58.
42. Stubbe J, De Moor M, Boomsma D, de Geus EJC. The association between exercise participation and well-being: a co-twin study. *PMJ.* 2007; 44 (2): 148- 152.
43. Salesi M, Jowkar B. Effects of exercise and physical activity on happiness of postmenopausal female. *Iranian J Ageing.* 2011; 6 (2): 7- 14.