

## Relationship Between Physical Activity and Depression Among Iranian High School Students

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### Abstract

**Introduction:** Today, the rapid technological developments and increasing urbanization lead to decreasing the physical activity.

**Aim:** The present study aims to investigate the relationship between physical activity and depression among Iranian high school students.

**Method:** In a cross-sectional method, we evaluated high school students in of Ilam (Iran) during the academic year 2016. Multistage cluster random sampling was used to select the participants. Data were collected by demographic, Beck's Depression Inventory and International Physical Activity Questionnaire. Data analysis was carried out with IBM SPSS using descriptive and inferential statistics. A P-value was less than 0.05 was considered as significant level.

**Results:** Overall, 400 high school students were studied. Overall, 49.5% of study populations have normal mental health and others experience some grade of depression, without significant differences in both genders ( $p=0.747$ ). There was a significant relationship between physical activity and depression ( $P=0.000$ ,  $r = -0.265$ ).

**Conclusion:** About half of study population experience some grade of depression. Regarding the relationship between decreasing the physical activity and increasing the risk of depression, must be given attention to increase physical activity, especially among adolescents and young people.

**Keywords:** Depression, Iranian adolescents, Physical activity

### Introduction

Today, the rapid technological development and urbanization has created a decrease in physical activity [1]. The researchers indicated that individuals with lower physical activity have a higher chance of mental complications such as depression and anxiety than those who perform physical activity regularly [2]. In fact, depression as a common psychiatric disorder affects 121 million adults in the worldwide [3]. Adolescents are an important age group for mental disorders. Therefore, risk factors of depression in childhood and adolescence is important [4].

A famous reference suggested the physical activity have an important effect on mental state through a rise in serotonin levels [5], in fact, decreasing the physical activity is associated with increasing the depressive symptoms [6].

The patients have to endure the side effects of medical treatment in addition to their depression problems [7]. As well as, the researchers believed that the physical activity and exercise are more effective than medication in treatment of depression [3].

The present study aims to investigate the relationship between physical activity and depression among Iranian adolescents as a sensitive society.

### Method

#### Participants

In a cross-sectional method, we evaluated high school students in of Ilam (Iran) during the academic year 2016. Multistage cluster random sampling was used to select the participants. First, two high schools (one female school and one male school) were randomly selected from schools in Ilam (Iran).

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The sample size was calculated using Cochran formula, as follows:

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left( \frac{z^2 pq}{d^2} - 1 \right)}$$

N= Statistical population size: All students of Ilam were 10000

n= Sample size

Z= Standard normal variable, which is 1.96 at 95% confidence interval

p= Ratio of a trait in the population, which can be considered as 0.5 if not available

q= Percentage of those without that trait in the population (q= 1-p)

d= Acceptable margin of error, which is considered as 0.05

Thus, 369 students were obtained as the study sample size. However, there was the possibility of sample loss, 400 students were considered. Sampling was performed using a multi-stage sampling method as described in previous studies [8,9].

### Measures

Data were collected by demographic, Beck's Depression Inventory and International Physical Activity Questionnaire (IPAQ).

### Demographic information questionnaire

This questionnaire was designed by the authors and assessed variables such as the age, gender, education field, and education level. The variables such as parents' occupation were divided into two groups (official and non-official). The parents' education variable was divided into five subgroups (illiterate, primary, secondary, diploma and college education).

### IPAQ

The questionnaire consists of five sections. The first part evaluated the daily physical activity. In the other parts evaluated all the transportation, physical activity, help to parents at housework, sport and physical activity in leisure time and time spent sitting.

### Ethics

This study was approved by the Ethical Committee of the Islamic Azad University of Ilam, Iran. Firstly, the study aim was described to study participants and an informed consent was obtained from them before the enrollment in the study. All questionnaires were completed anonymously and only required information was collected to enhance the study confidentiality.

### Analytic strategy

Data analysis was carried out with IBM SPSS for Windows ver. 20.0 (IBM Co., Armonk, NY, USA) using descriptive and inferential statistics. The  $\chi^2$  test was used to test the categorical variable. A P-value was less than 0.05 was considered as significant level.

### Results

Overall, 400 high school students were studied. Eight participants did not answer the Beck's Depression Inventory completely, so they were eliminated in the depressed state. Half of study population has normal mental health and others experience some grade of depression, without significant differences in both genders. The participants' characteristics according to gender are presented in Table 1.

Variable		Gender, N (%)		Total	P-Value
		Male	Female		
Depression	Normal	110 (57.3)	82(41.8)	192(49.5)	0.747
	Mild depression	68(35.4)	80(40.8)	148(38.5)	
	Moderate depression	14(7.3)	34(17.4)	48(12)	

Table 1: Comparison of Characteristics study participants according to the gender

The results indicated a significant relationship between physical activity and depression (P= 0.000 and r= - 0.256). Among the components of physical activity the highest correlation observed between the exercise activity with transportation (r= 0.754) and daily physical activity (r= 0.743).

The correlation between physical activity components among the study participants is presented in Table 2.

### Discussion

In the present study, the relationship between physical activity and depression was evaluated among Iranian adolescents. In a Cross -Sectional study, 400 high school students in Ilam (Iran) were randomly selected and evaluated during the academic year 2016.

Variable		Sitting	Exercise activity	Housework activity	Transportation activity	Daily physical activity
Daily physical activity	r*	0-.059	0.743	0.338	0.465	1
	P-value	0.466	0.000	0.000	0.000	
Transportation	r*	0-.102	0.754	0.451	1	
	P-value	0.208	0.000	0.000		
Housework	r*	0.131	0.716	1		
	P-value	0.104	0.000			
Exercise activity	r*	-0.047	1			
	P-value	0.564				
Sitting	r*	1				
	P-value					

Table 2. The correlation between physical activity components among the study participants

Nearly half of the study participants had healthy mental status; however, others experienced some degree of depression, without differences among females and males. Our previous study indicated the mental disorders in 40% of Iranian students, Although there was a difference between females and males [10]. Probably the reason for this difference is due to measurement tools. In the present study, we determined the prevalence of depression using Beck's Depression Inventory but in the previous study we used of GHQ- 28.

Our results demonstrate a significant correlation between physical activity and depression. The increasing of the physical activity was associated with the decreasing the risk of depression. Although antidepressants are used widely [11], but there is a reduced tendency for the use of these drugs due to lack of complete remission, relapse after stopping treatment, and drug dependency [7]. In line with the results of our study, there is scientific evidence to reduce the risk of depression in individuals with higher physical activity [12]. The results of a systematic study showed the positive effect of increased physical activity in the treatment of depression [13]. However, the short-term effects of exercise on body composition and decrease of depressive symptoms has been accepted, but also, there are contradictions in the long-term effects of exercise in reducing depressive symptoms [14]. Some scientists believe that depressed individuals have limited physical activity [15,16].

## Conclusion

About half of study population experience some grade of depression. Regarding the relationship between decreasing the physical activity and increasing the risk of depression, must be given attention to increase physical activity, especially among adolescents and young people.

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