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Review Article

The Relationship between the Frequency of Physical Activity and the Level of Depression

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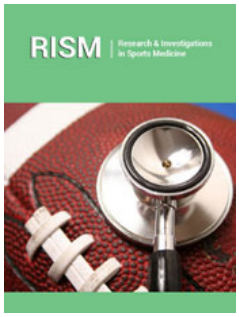
ISSN: 2577-1914



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Submission: January 17, 2022

Published: November 30, 2022

Volume 9 - Issue 2

How to cite this article: Milica Čolović* ,Vladimir Mitić. The Relationship between the Frequency of Physical Activity and the Level of Depression. Res Inves Sports Med. 9(2), RISM.000707. 2022. DOI: 10.31031/RISM.2022.09.000707

Abstract

Insufficient physical activity is one of the leading factors which affect the increased mortality rate. Physical activity is recommended to everyone because of the benefits it provides, when it comes to physical and mental health. Namely, a large number of researches have indicated that there is a certain correlation between physical activity and the level of depression in people. The aim of the current research is to determine the relationship between the level of depression and the frequency of physical activity, as well as the gender differences that exist in the physically activity, and which gender is more prone to depression. The sample in the current research consists of 355 respondents which filling out online questionnaires. Data were processed in the SPSS program. The results showed that with increasing physical activity, the level of depression in people decreases, and vice versa. It was also found that men are more physically active than women, and that women are more prone to depression. The implications of the research are reflected in emphasizing physical activity as one of the effective ways of coping with depression in general, as well as the raising awareness among people about the importance engaging in physical activity.

Keywords: Physical activity; Depression; Mortality; Gender differences

Introduction

The current Covid-19 pandemic has led to more and more people, as well as relevant institutions involved in the health systems of countries, pay more attention to the importance of strong immunity in humans. Based on stronger immunity, people would avoid or recover more easily from the consequences of current and potential viruses in the future. In addition to a proper nutrition, such as food of organic origin rich in vitamins, minerals and useful nutrients and the absence of toxins [1], adequate physical activity also has a great influence on immunity. The importance of physical activity as one of the preventive measures for the prevention of many diseases, as well as the improvement of general health is a well-known fact. Lack of physical activity is responsible for nearly two million deaths a year [2]. According to the World Health Organization physical inactivity was identified in 2009 as the fourth leading cause of mortality.

A wide range of depressive disorders, often associated with insufficient physical activity, are the second leading cause of the global disease burden, leading to enhanced medical comorbidity [3], Increased health care costs [4], and a large number premature deaths [5]. Therefore, the recommendation of the World Health Organization is that, in order to improve the general health of the world's population, adults should have intense physical activity of 75 minutes or moderate physical activity of 150 minutes per week.

Literature Review

According to the results of many studies men are generally more physically active than women. However, a certain number of studies suggest otherwise. There is ample evidence that health is improved by more or less intensity of physical activity. As well as maintaining good physical health, moderate physical activity also enables bone strengthening and muscle development [6]. Regular physical activity reduces the risk of chronic diseases and premature

death by 20 to 30% [7]. Thus, physical activity reduces the risk of diabetes, high blood pressure, heart disease, asthma and arthritis [8]. In addition, adequate physical activity can reduce stress levels in people, especially if they are engaged in occupations that cause higher levels of stress [9].

Beside to physical health, physical activity is also very important for mental health because it can reduce the symptoms of anxiety and depression [10]. According to a large number of studies, people who are physically active are less likely to develop mental illness [11,12]. One of the main factors that leads to development of depression and generally decreased mood in people is the lack of physical activity [13,14]. People with major depressive disorder are generally not physically active enough. Also, well-planned physical activity reduces the symptoms of depression in people who already have chronic depression [15]. Therefore, physical activity is one of the protective factors against the occurrence of depressive disorders and alleviation of its symptoms [16,17].

There is a two-way relationship between physical activity and depression, which means that physical activity reduces the risk of depression, but symptoms of depression also reduce physical activity in people as well [18]. One of the main characteristics of depression is anhedonia - complete absence of pleasure from things that people liked to do, which can lead to cancellations from physical activities that were pleasant and used to give them pleasure. Besides, negative symptoms of depression include motor retardation and lack of energy, which can also lead to reduced physical activity [18].

Depression often has a major impact on increased morbidity and mortality rates, through an increased risk of suicide and major impacts on brain and somatic functioning. Numerous studies have shown that there is a correlation between physical activity and depression [18-22], while others has not found connection between them [22,23]. According to one study, there is a low correlation between physical activity and depression and it is only 5% [14]. Just 150 minutes of physical activity a day reduces the risk of depression from 8% to 63% [24-26]. According to other researchers, daily multi-hour physical activity reduces the chances of depression by 48% [27]. Even low-intensity physical activity, such as walking more than 40 minutes a day, reduces the risk of developing depression by 6% to 17% [22,26]. Similar results were obtained in two more studies according to which physical activity at least twice a week can reduce the risk of depression by 40% [14,28].

There are a number of mechanisms through which physical activity reduces the risk of depression. Physical activity can increase the secretion of monoamines such as serotonin, dopamine and others that improve mood and have a positive effect on people, thus reducing the risk of depression [29]. In addition, physical activity can increase self-confidence in people which also, indirectly, reduces the risk of depression [30].

Depression is especially dangerous in adolescence because the personality is not yet fully formed and is associated with the higher risk of suicide, academic failure, drug abuse and delinquency [31]. It is estimated that about 8% of adolescents have problems with depression [32]. Depression is more pronounced in girls during adolescence, as well as, in older age [33]. Based on the results of one research boys under 13 years show higher levels of depression than girls, but after these years this relationship changes and depression is more common in women [34].

Low levels of physical activity in adolescence increase the risk of depression in adulthood [35]. According to the results of many studies, women are generally more prone to depressive disorders [36-40]. However, depression is more pronounced in older men who live alone than in women [41,42].

Research Methodology

The main goal of the research is to determine the existing connection - relationship between the frequency of physical activity and the level of depression. It also examines whether men or women are more physically active, and which gender is more prone to depression.

The following research hypotheses were set:

A. People who are physically active are less likely to develop depression (H1);

B. Men are more physically active than women (H2);

C. Women are more prone to develop depressive disorders than men (H3);

The research was conducted online with Google forms questionnaire that was sent to the addresses of 400 potential respondents. Beck's Depression Inventory was used. The final sample used in the survey consisted of 355 respondents who completed the entire 21-item questionnaire. The sample consisted of adult respondents between 25 and 65 years. Gender representation in the sample is approximate, as the sample consists of 165 men (46.5%) and 190 women (53.5%). Data were processed in the SPSS program, using non-parametric techniques such as: Spearman's correlation coefficient and Man-Whitney-U test, due to the fact that distribution of scores on the registered variables, deviates significantly from normal.

Result and Discussion

The obtained results confirm the first hypothesis (H1) and suggest that there is a high negative correlation between frequency of physical activity and levels of depression (ρ=-0.583; n=355; $p<0.001$). Namely, this means that people who are more physically active are less likely to develop depressive disorders, ie that physical activity reduces the level of depression (Table 1). Also, in people who already suffer from some form of depression, it affects the reduction of their physical activity.

Table 1: Correlations (relationship between physical activity and depression).

		Physical activity	Depression
Physical Activity	ρ	1.000	- 583**
	Sig.		.000
	N	355	355
Depression	ρ	- 583**	1.000
	Sig.	.000	
	N	355	355

The obtained results are consistent with one large group of research [18-22,28], while not consistent with another results, according to which there is no correlation between levels of physical activity and depression [23]. The second hypothesis suggest that men are more physically active than women (H2), was tested using the Mann-Whitney U test in order to examine the difference in scores between the two groups of subjects.

Table 2: Result of Mann-Whitney U test - statistical significance of gender differences.

	Physical Activity	Depression
Mann-Whitney U	22140.5	21231.5
Sig.	0	0.001

Statistically significant differences were obtained in the scores of male and female respondents, both in terms of physical activity (U=22140.500; p<0.01), and the level of depression (U=21231.500; p<0.01) (Table 2). When it comes to physical activity, men are more physically active (MR=325.81) than women (MR=276.88) (Table 3). Thus, the second hypothesis (H2) was confirmed. One potential reason for greater physical activity in men is that they are more inclined to do sports, and almost all sports require a certain physical condition. In addition, men often gather in nature and on sports fields to compete with each other, while women tend to spend their free time tidying up the house, shopping or chatting with friends. The obtained results are consistent with researchers according to which men are more physically active than women, while they are not consistent with other group of authors.

Table 3: The magnitude of the obtained gender differences in the level of physical activity and depression.

	Gender	N	MR	∑R
Physical Activity	Male	165	325.81	150043.50
	Female	195	276.88	121361.50
	Total	355		
Depression	Male	165	294.31	149214.50
	Female	195	334.49	161153.00
	Total	355		

Regarding the level of depression, it is more pronounced in women (MR=334.49) compared to men (MR=294.31) (Table 3). This confirms and the third hypothesis (H3). One of the possible reasons is that women often spend more time at home then men and household chores can seem monotonous, and even a longer staying at home can increase the level of depression. These results are consistent with research showing that women are more prone to depression and more likely to suffer from various type of depressive disorders [36-40], while not consistent with other research [41,42].

Conclusion

Physical activity is one of the best ways to prevent depression or to alleviate the symptoms of depression in people who already have certain depressive disorders. Depression affects the reduction of physical activity because people in that state are less physically active than others. Men are more physically active than women because they are generally more inclined to play sports and compete with others. Besides, men are more likely than women to be professionally engaged in jobs that require a certain condition, so they must be physically active enough. When it comes to depression, women are more prone to depressive disorders because they usually do most of the housework and spend far more time at home, thinking about many things at once, which in itself can lead to a higher risk of vriosu depressive disorders.

The theoretical and practical significance of the research is reflected in obtaining data on the relationship between physical activity and levels of depression, in order to determine how it can be applied in reduction the number of people who suffer from various depressive disorders. This would improve the mental health of the world's population and reduce the impact of depression on global mortality and health insurance costs [42-45].

The implications of this research are reflected in emphasizing the importance of physical activity as one of the adequate and optimal ways to reduce the level of depression in the population in general. Subsequent surveys may be extended to randomly selected respondents in urban and rural areas to make the sample more representative. Also, all age groups, from adolescents to the oldest, can be included in the sample in order to see the relationship between depression and physical activity for all age categories.

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