

Effect of Physical Activity on Depression and Psychological Well-Being

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Abstract

Aim: This research was conducted to determine whether physical activity had an effect on the levels of depression and psychological well-being. **Material and Method:** In this research, the single group pre-test post-test model which is one of the trial models was used for the purpose of determining the causal relationship. The study group is composed of 43 sedentary volunteer students ($n_{\text{Males}} = 9$, $n_{\text{Females}} = 34$; age 20.86 ± 1.04 years) pursuing their education at the Emergency Medical Technician Program in the Vocational School of Health Services at the Kırşehir Ahi Evran University. The heights and body weights of the study group are measured and they are asked to fill out the “Personal Identification Form”. The 10-week physical activity program was explained to the students. For the purpose of determining their levels of depression before and after the physical activity, the “Beck Depression Inventory (BDI)” was used, and to measure their psychological development, the “Psychological Well-Being Scale (PWBS)” was used. The descriptive statistics were provided. Later on, the normality assumption was checked out. In the consequence of this assumption, the researcher decided to conduct the Wilcoxon Signed Ranks Test. The data is tested at the level of significance of $\alpha = 0.05$. The researcher obtained permission from both the related institution and the ethical board. **Results:** The BDI pre-test results of the students indicate that the male students had minimal level of depression (0-9) and the female students had slight level of depression (10-16). In terms of the study group, while the students were found to have slight

level of depression in terms of their BDI pre-test scores, it was observed that the students had minimal level of depression in terms of their post-test scores. At the same time, the scores of the pre-test and post-test PWBS score increased from 49.89 to 53.33 for males, and from 41.94 to 43.94 for females. In sum, those scores increased from 43.60 to 45.91. A significant difference ($p < 0.05$) in both BDI and PWBS between the pre-test and post-test was observed. While the depression levels of the students decreased, their psychological well-being levels increased. Conclusion and Suggestions: The 10-week physical activity program caused an improvement both at the levels of depression and psychological well-being. Therefore, sparing some time for physical activity is suggested for our psychological health on a daily basis. Do not forget: “*physical activity is going to benefit people*”.

Keywords: Depression, Physical activity, Psychological well-being

1. Introduction

The humans continue their lives within their *raison d'être*. Within this process, humans need to change their location, namely they need to act. Whether this necessity is at the level of either the physiological needs or the psychological needs, physical activity is a phenomenon within humans' lives. The opposite of action is inaction (Doğan, 2013). This research perceives the concepts of activity and inactivity in terms of physical activity.

The physical activity is one person's burning energy (Yang & Hsu, 2010). The physical activity has physical and psychological effects. In the literature, many researchers explained the positive effects of the physical activity on the individuals' physical and psychological health (Teychenne et al., 2008; Samitz et al., 2011). Besides, the World Health Organization (WHO) reported that about 1.4 billion adults (27.4%) did not perform sufficient amount of physical activities to improve their health. It is also known that the decrease of the level of physical activity introduced many sicknesses (Yang & Hsu, 2010).

This research addresses the physical activity through psychological factors. Therefore, it focuses on the concepts of *depression* and *physical well-being*. The depression, which is widely observed around the world and expressed as psychological breakdown (*ruhsal çöküntü*) in Turkish, is known as sad and desperate state of psychological mood (Öztürk, 1997). The concept of depression appears as a psychological condition where the individual loses his/her desire to live, feels himself/herself in a deep sorrow, has pessimistic thoughts about the future, has a lot of regrets about the past, has sense of guilt and sometimes has ideas about death and committing suicide (Alper, 1999). At the basis of depression, the individual feels unwillingness towards daily activities which the individual previously performed willingly and does not enjoy life (Quinn, 2002; Köroğlu, 2006). The individual may become unable to enjoy life and feel psychologically broken as far as to think that life does not mean to live. This negative perception is reflected on the actions of the individual from the daily life to entertainment. At the same time, it causes the decrease of the performance of the individual in his/her school, business and social life and thusly the individual becomes unhappy (Güleç & Köroğlu, 1997).

The psychological well-being is defined as self-realization, full functioning and maintaining a

meaningful life when it comes to existential challenges and difficulties encountered in life such as maintaining meaningful purposes, personal development, establishing meaningful relations with other individuals (Keyes et al., 2002; Deniz et al., 2017). The individuals need to take part in many activities in their spare times such as sports and arts to be able to minimize the negative effects created by the environment, to regain the reduced mental energy in work and social life and to feel happy, well and healthy. Those activities would allow them to be well psychologically (Tekin et al., 2009).

The individual wants to feel good. The individual's ability to do so is up to the individual. However, when we observe our environment, some individuals may say things like "Nobody understands me". A depressive song may get positive reactions. Additionally, individuals today encountered many conveniences in their lives with the development of the technology. It is believed that those conveniences have driven people away from performing physical activities.

This research is conducted to propose a solution specific to the paragraph above. The purpose of this research is to determine whether the physical activities of individuals affect their levels of depression and psychological well-being.

2. Material and Method

2.1 Model of the Research

In the research, the "single group pre-test post-test model", which is one of the trial models, was used. The trial models are research models under the direct control of the researcher where the researcher creates the data which the researcher wants to observe. It is performed with a single group, by the method of applying an independent variable to a randomly selected group in the pre-test post-test model. The measurements are performed on the study group before and after the experiment. In every research performed by the trial model there is definitely a comparison. Those are the cause that is called as independent variable or the stimulant variable and the result that is called the dependent variable (Karasar, 2009). The dependent variables of the research are levels of depression and psychological well-being, and the independent variables are age, gender and 10-week physical activity program.

2.2 Study Group

After obtaining the necessary permission to perform the research, the students were provided information regarding the purpose, scope and methodology of the research. The individuals, who take part in the research based completely on volunteerism principle and who were examined by the health professionals and found to have no problems in terms of taking part in the research, were included in the research. All students were informed regarding the possible risks of the experimental procedure and their written informed consents were obtained. After considering those procedures, the study group is as explained below:

The study group is composed of 63 sedentary students pursuing their education at the Emergency Medical Technician Program in the Vocational School of Health Services at the Kırşehir Ahi Evran University. Out of those students, 43 healthy volunteering students, who

filled out the Beck Depression Inventory (BDI) and the Psychological Well-Being Scale (PWBS) in full, and are composed of male ($n = 9$, 20.9%) and female students ($n = 34$, 79.1%), whose ages ranged between 22 and 24 (20.86 ± 1.04), constituted the study group of the research.

Table 4.13 in Kusan's (2017) research which we perceive closer to this research was examined. By moving from the data provided in the mentioned table, the G*Power analysis was performed by the 95% test power. In the consequence of this analysis, it was calculated that at least 15 students were sufficient. Thusly, the researcher deemed that the number of students in the research was appropriate in terms of performing the research.

2.3 Methods and Tools of Data Collection

The procedure of data collection is composed of three stages. In the first stage, the heights and body weights of the students were performed and the students were asked to fill out the "Personal Information Form". In the first and third stages, the students were asked to fill out the inventory and scale to be used for the pre-test and post-test. The second stage is the 10-week physical activity program.

2.3.1 First Stage

2.3.1.1 Measurement of Height and Body Weight

In the measurement of height, the stadiometre (Seca, Germany) with a sensitivity of ± 1 mm (millimeter) was used. The heights of the students were measured as the students stood with their sportswear standing after a deep inspiration by looking straight forward.

In the measurement of body weight, the electronic scale (Medisana, Germany) with a sensitivity of ± 1 g (gram) was used. The body weights of the students were measured without their shoes and sportswear.

2.3.2 Second Stage

2.3.2.1 Physical Activity Program

On the days and hours when the students were asked to perform physical activities, they were asked to come to the gymnasium of the Sports Sciences Faculty of the Kırşehir Ahi Evran University. The physical activity, accompanied by 3 teaching assistants and 1 assistant professor, was maintained for 1.5 hours per day, 2 days a week for a total duration of 10 weeks (90 minutes-2 days-10 weeks). In the physical activity program, it was considered that the students were sedentary. Therefore, in the program, the physical activities were performed step by step from the easy ones to the difficult ones, and from the simple ones to the complex ones in a progressive manner.

In the stage of performing and teaching the physical activities, attention was paid for the safety of the students, whether they were able to hear the instructions, see the activities and perform them and have the sufficient opportunity for performing the activities. In the 10-week physical activity program, simple jogging exercises helping breathing were performed during the 1st week. Later, the basic technical training of the predetermined sports branch was performed 1

week for each sports branch. Later on, a match was performed in the related sports branch for 1 week for each sports branch. In those applications, the 10-week physical activity program was completed. Additionally, for the duration of 10 weeks, warm-up exercises were performed before each physical activity and stretching exercises were performed after each physical activity. Moreover, the Karvonen Method is used in determining the volume of training. For the purpose of applying this method, a few students were asked to provide data for the random calculation formula and during the application the pulses of some students were checked out. Thusly, the volume of training was attempted to be kept under control. We may argue that the lack of sufficient number of polar hours is among the limitations of this research.

(1) 10-week Physical Activity Program

1st Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Gradual jogging training (20 to 30% walking-10 minutes), 40 to 50% running (10 minutes) and 20 to 30% walking (10 minutes); Cool-down: 10 minutes.

2nd Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Basic technical training for basketball (10 × 3: 30 minutes); Cool-down: 10 minutes.

3rd Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Basketball match (10 × 3: 30 minutes); Cool-down: 10 minutes.

4th Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Basic technical training for volleyball (10 × 3: 30 minutes); Cool-down: 10 minutes.

5th Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Volleyball match (10 × 3: 30 minutes); Cool-down: 10 minutes.

6th Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Basic technical training for handball (10 × 3: 30 minutes); Cool-down: 10 minutes.

7th Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Handball match (10 × 3: 30 minutes); Cool-down: 10 minutes.

8th Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Basic technical training for badminton (10 × 3: 30 minutes); Cool-down: 10 minutes.

9th Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Badminton match (10 × 3: 30 minutes); Cool-down: 10 minutes.

10th Week: 2 days a week (Mondays and Thursdays); Warm-up: 15 minutes (general warm-up); Training: Gradual running (40 to 60% running, 10 × 3: 30 minutes); Cool-down: 10 minutes.

2.3.3 Third Stage

2.3.3.1 Beck Depression Inventory (BDI)

This scale is developed by Beck to measure depression risks, levels of depressive indicators and changes of its magnitude in adults (Beck, 1974). In 1989 Hisli performed its Turkish validity and reliability research and determined the cutting score of the scale as 17 (Hisli, 1989).

The BDI which is frequently used in studies regarding depression and is composed of 21 items, is connected with each item's behavioral characteristics regarding depression. The items in the scale is a Likert-type scale scored between 0 and 3 based on the level of depression and they vary between scores of 0 and 63. And the reference intervals of the scores obtained from the scale are as follows: 0-9 points represent minimal depression; 10-16 points represent slight level of depression; 17-29 points represent medium level depression; and 30-63 points represent heavy depression. In the reliability research of the Turkish form of the inventory, the Cronbach Alfa Coefficient was determined as .80 (Aydemir & K rođlu, 2006).

2.3.3.2 Psychological Well-being Scale (PWBS)

The adaptation of this scale developed for measuring socio-psychological development of individuals (Diener et al., 2010) into Turkish was performed by Telef (2013). The scale is composed of a single factor including 8 items of 7 point Likert-type scales. The scores of the scale vary between 8 and 56. The high score obtained from the scale indicates that the individual has many psychological sources and power. The total explained variance in the consequence of explanatory factor analysis was determined as 42%. The factor loads of the items included in the scale range between .54 and .76. The Cronbach Alpha Coefficient obtained in the consequence of the reliability research of the scale is .80.

The Cronbach Alpha Coefficient of the BDI used in this research is .89 for pre-test and is .91 for post-test. The Cronbach Alpha Coefficient of the PWBS is .86 for pre-test and is .91 for post-test.

2.4 Analysis of Data

The Shapiro-Wilk test was used to verify the data's normality assumption because of the research's study group was under 50 (B y k zt rk, 2020). As a result of the test ($p < 0.05$), it was seen that the data were distributed nonparametrically. Therefore, Wilcoxon Signed Ranks Test was used in the pretest-posttest comparisons ($\alpha = 0.05$). Also, in descriptive statistics; percent (%), mean (\bar{x}) and standard deviation (sd) values were determined.

2.5 Ethical Aspect of the Research

For this research, the necessary permissions were obtained from both the Kırsehir Ahi Evran University, Vocational School of Health Services (Number: E-45595862-000-00000405437) and the Kırsehir Ahi Evran University, Social Sciences and Humanities Scientific Research and Publication Ethics Board (Number: 2022/06/01).

3. Results

The descriptive statistics regarding the gender, age, BDI pre-test and post-test and PWBS pre-test and post-test scores are provided below.

Table 1. Descriptive statistics regarding the variables

Variables		Male n = 9 (20.9%)	Female n = 34 (79.1%)	Total N = 43 (100%)
		$\bar{x}\pm sd$	$\bar{x}\pm sd$	$\bar{x}\pm sd$
Age (yıl)		20.67±0.87	20.91±1.08	20.86±1.04
Body Weight (kg)		68.44±10.32	55.47±7.00	58.19±9.34
Height (cm)		173.78±3.83	163.79±5.65	165.88±6.69
BDI	Pre-test	8.67±11.41	12.74±7.62	11.88±8.56
	Post-test	5.67±9.43	9.79±7.87	8.93±8.27
PWBS	Pre-test	49.89±7.51	41.94±7.13	43.60±7.83
	Post-test	53.33±4.27	43.94±8.19	45.91±8.43

Note. N/n: Number of subjects; kg: Kilogram; cm: Centimeter.

According to Table 1, the total number of students is 43 of whom 20.9% are males ($n = 9$) and 79.1% are females ($n = 34$). Their ages range between 22 and 24 (20.67 ± 0.87 year). While the body weight of the students is 58.19 ± 9.34 kg, their height is 165.88 ± 6.69 cm. While their BDI pre-test score is 11.88 ± 8.56 , their post-test score is 8.93 ± 8.27 . While their PWBS pre-test score is 43.60 ± 7.83 , their post test score is 45.91 ± 8.43 .

Table 2. Wilcoxon Signed Ranks Test regarding determining the difference between the scores of pre-tests and post-tests of the students for the BDI and PWBS

Variables	Groups	N	MR	SR	z	p
BDI Pre-test BDI Post-test	Negative Ranks	26	22.69	590.00	-3.192	0.001**
	Positive Ranks	12	12.58	151.00		
	Ties	5				
	Total	43				
PWBS Pre-test PWBS Post-test	Negative Ranks	10	20.25	202.50	-2.439	0.015*
	Positive Ranks	28	19.23	538.50		
	Ties	5				
	Total	43				

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

MR: Mean of Ranks; SR: Sum of Ranks.

In Table 2, the difference between the BDI pre-test and post-test mean of ranks was perceived as statistically significant ($z = -3.192$; $p < 0.01$). The mentioned difference took place on behalf of the post-test. The levels of depression which came out as high in the pre-test measurement decreased significantly in the post-test. The difference between the PWBS pre-test and post-test mean of ranks was perceived as statistically significant ($z = -2.439$; $p < 0.015$). The mentioned difference took place on behalf of the post-test. The levels of psychological well-being which came out as low in the measurement of pre-test increased significantly in the post-test.

4. Discussion

This research focuses on the importance of physical activity. This importance is also supported by the official institutions in our country. For instance, the projects of the Ministry of Health named “10 Thousand Steps Every Day” and “Pedal for Health” (Saglik, 2022) and the project of the Ministry of Youth and Sports named “Run While You Can” (GSB, 2022) support the importance of this research. At the same time, we should not forget the fact that the WHO suggested physical activity for 2.5-5 hours per week for children, youngsters and the middle aged persons (WHO, 2022).

The introductory section of this research mentions the fact that the physical activity has decreased due to the technological developments. In his/her research, İlhan (2010) indicates that especially the children and youngsters remain inactive in front of the television and computer for extended periods. At the same time, the author also indicates that the children and youngsters were addicted at this point and made inactive lifestyle a culture. Therefore, the literature supports both the importance of this research and the fact that the physical activity has decreased. Also the introductory section of this research included an argument regarding that the depressive songs found a fast response in the society against the people’s demand for feeling good (Ersöz, 2022). When the research data is examined, it was found out that the BDI pre-test results indicated that the males had minimal level of depression (0-9) and the females had slight level of depression (10-16). Therefore, the purported argument is supported within the scope of this finding.

The WHO indicates that besides having a positive contribution into the mental health, the physical activity also positively affects people in terms of anxiety and depression (WHO, 2022). Additionally, when the literature is examined in the general sense, we see that the physical activity has many positive effects on the psychological health of individuals. For instance, we see that there are many studies indicating that it reduces stress, taking place in the treatment processes as a healing factor in depression (Tekin et al., 2009; Arslan et al., 2011), and thusly makes a contribution for individuals so that they feel happy and well (Huang and Humphreys, 2012; Uğurlu et al., 2015). Additionally, it was also revealed that regular exercise has positive effect on cognitive functions (Van Dijk et al., 2013), depression (Mammen & Faulkner, 2013), and quality of life (Bullo et al., 2015). In the findings of the research, while the students had slight depression in terms of their BDI pre-test scores, it was observed that the students had minimal level depression in terms of their post-test scores. At the same time, the pre-test and post-test PWBS scores increased from 49.89 for males and from 41.94 to 43.94 for females. In

total, they increased from 43.60 to 45.91. It was observed that there was a significant difference ($p < 0.05$) between the pre-test and post-test both in terms of the BDI and the PWBS. While the depression level of the students decreased, their level of psychological well-being increased. Thusly, the findings of the research and the literature support each other.

As a result, the 10-week physical activity program both provided an improvement in the level of depression and increased the condition of psychological well-being. If we think through those two concepts, it is clear that sports or physical activity has positive effect. Therefore, we should perform physical activities for our psychological health. To do this, it is enough to spare some time from our daily routine. Please continue to move for a life which is full of physical activity.

If we make an addition to a well-known phrase for the purpose of raising a smile, (Hasanova, 2008), we may say “*If music is food for the soul, then sports are dessert for it.*”

If we want to create a motto, then we may say “*Physical activity is going to do good for people.*”

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