

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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*EFFECT OF AEROBIC EXERCISE ON BODY COMPOSITION OF OVERWEIGHT FEMALE;  
INSPIRING UNIVERSITY STUDENTS TO PRACTICE  
AND RECEIVE MORE ADVANTEGEOUS WAY OF LIFE*

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**ORIGINALNI NAUČNI ČLANAK**

doi: 10.5550/sgia.201601.se.nkpas

UDC: 796.035-056.257

Primljeno: 26.06.2020.

Odobreno: 21.09.2020.

Sportlogia 2020, 16 (1), 110-125.

E-ISSN 1986-6119

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## **SAŽETAK**

*Istraživanje je provedeno sa ciljem procjenjivanja efekata programa aerobnih vježbi na tjelesni sastav žena sa prekomjernom tjelesnom težinom u dobi od 22 do 27 godina. Uzorak od 30 žena sa prekomjernom težinom u dobi od 22 do 27 godina iz okruga Tonsa (Pandžab), Pakistan bio je uključen u istraživanje. Program vježbanja od četiri sedmice pripremljen je i proveden sa ispitanicama eksperimentalne grupe. Eksperimentalna grupa je podvrgnuta mjerenju antropometrijskih, kao i mjerenja kožnih nabora (3 nabora). Podaci izmjereni prije i poslije programa (kod kontrolne i eksperimentalne grupe) su pažljivo zabilježeni kao baza podataka. Za dobijanje valjanih zaključaka korištene su deskriptivna (srednja i standardna devijacija) i inferencijalna statistika (nezavisni uzorak t-test i upareni uzorak t-test).*

*Analizom podataka utvrđeno je da je srednja ocjena (EG) prije i poslije programa iznosila 28,66 i 23,5. T-vrijednost tabele je 5,022, a statistička značajnost 0,001 - što je niže od*

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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nivoa značajnosti ( $P < 0,05$ ), pa se zaključuje da je razlika između prije i poslije pokazala značajne efekte aerobnih vježbi na postotak tjelesne masti kod ispitanica kontrolne grupe. Prema analiziranim podacima, srednja vrijednost post-testova u pogledu postotka tjelesne masti kontrolne grupe iznosila je 28,89, a eksperimentalne grupe 23,5. Statistička značajnost 0,002 i vrijednost  $t = -987$  u tabeli prikazuju značajnu statističku razliku indeksa tjelesne mase ( $P < 0,05$ ) kod ispitanica kontrolne i eksperimentalne grupe. Dobijeni rezultati su ukazali na to da su aerobne aktivnosti tokom četiri sedmice vježbanja imale značajan efekat na ispitanice sa prekomjernom težinom u smislu smanjenja postotka njihove tjelesne masti. Na osnovu dobijenih rezultata, preporučuje se da se žene sve više uključuju u fizičke aktivnosti i vježbanje.

**Ključne riječi:** efekat, aerobno vježbanje, tjelesna kompozicija, prekomjerna težina, studenti, kvalitetniji život.

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## INTRODUCTION

Leading a happy and a successful life is the innate quest of all human beings. Good physique and sound health are the prerequisites to satisfy this human desire. One may take part in exercise to achieve optimal physical fitness. It is a matter of common observation that majority of us particularly among female folk leads sedentary life and findings of the research states that in sedentary lifestyle the human health is obviously prone to various unfavorable situations like obesity, weight gain, hypertension and other chronic

diseases (Tudor-Locke, Craig, Thyfault, & Spence 2013). In this regard, participation in some kind of daily exercise occupies its own remarkable role in the maintenance and promotion of good health (Stathi, Fox, Withall, Bentley, & Thompson 2014). Research reveals that people who possesses optimal body composition seems to be healthier and feel better about themselves. It is very much important to know the right body composition and then focus towards the achievement and maintenance of it (Campos, 2004).

## EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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Even though, in our society women are not paying due consideration to the idea of exercise. For some individuals a prompter objective is to look fit and solid. Subsequently, numerous individuals don't get into the endeavors of fitness and solid body. Research suggested that effective management of body composition needs the harmonization of numerous characteristics including proper diet, stress management and more significantly adequate amount of exercise (Slentz, Aiken, Houmard, Bales, Johnson, Tanner, & Kraus, 2005). According to Kang et al. (2002) daily exercise results in the successful management of body composition.

The purpose of controlling body weight is actually a matter of adjusting body fat. In this regard, research reveals that achievement of healthy body composition not solely conform rigid standards of human wellbeing rather exercise is the key to achieve the goal of wellness in life style (Faigenbaum, Chu, Paterno, & Myer 2013). Several studies confirm that excess amount of body fat cause for various health problems like obesity, cardiovascular diseases (CVD) hypertension and diabetes (Bastien,Poirier, Lemieux, &Després 2014;

Lavie et al., 2016). Viewing upon this notion, result of the research revealed that women who are obese are more likely to suffer from menstrual abnormalities, and complications during pregnancy (Mandviwala, Khalid, &Deswal 2016) which match the findings of the study, conducted by Paladini(Paladini, 2009) found that obese women suffer from respiratory problems and joint diseases and more significantly complications during pregnancy. Study described that reduction of 5-10 % weight loss helped in the control of various heart problems including stroke, diabetes and other weight related disorders (Look AHEAD Research Group, 2016).

Participating in aerobic exercise play a vital role in controlling the weight ranged contributes to promoting mental and physical health as well. Health conscious people should take active part in physical activities to diminish anxiety, stress, and depression. They will sleep well, and feel much better and relaxed throughout the day. Lowry et al. (2000) recommended that 30 to 40 minutes' vigorous exercises several times per week are probably right for weight management. Regular, aerobic exercise is necessary for the survival of evolution. It is

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

---

possible to go through life with less physical activity than those in the past decades. Promotes the welfare of the living modern comfort and low energy; however, humans are not genetically adapted to the sedentary lifestyle. Physical activities initiate various adjustments inside skeletal muscles and the cardiorespiratory framework, all of which giving positive results to the counteractive action and treatment of numerous metabolic issue. Absence of practice ought to rather be seen as "anomalous" and related with various wellbeing dangers.

Keeping in view the brief discussion on the importance and vitality of aerobic exercise with reference to the body composition particularly among women, the researcher conducted a study entitled effects of aerobic exercise on body composition of overweight female aging 22-27 years in District Tonsa (Punjab), Pakistan.

The goal of the research is to evaluate the effect of aerobic exercise on body mass index and body fat percentage among overweight females aging 22-27 years.

## METHOD AND MATERIALS

The research methodology used in this study is described below.

### Research Design

Experimental research provides a systematic and logical method for answering the questions or testing the hypotheses. The experimental method provides a reliable way of studying the relationship between two variables under carefully controlled conditions (Kothari, 2004). Experiments can be conducted either in the laboratory or in the field. Field experiment is more suitable when the researcher wants to minimize the

possibility that people will change their typical behaviour (Frankfort-Nachmias, & Nachmias 2007). Therefore, the researcher adopted field experiment.

### Study Participants

Those overweight female who had never exercised were included in the study. For this purpose, thirty (30) volunteer agreed to participate in the study. The health risks of the subjects were verbally

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

---

inquired because the health conditions of the carefully chosen subjects were critical for the study. Therefore, the researcher put forth considerable attention to some of the major health issues like diabetes, hypertension, asthmatic problems which can make complications during the intervention period.

On the basis of Body Mass Index (BMI), a list of thirty subjects in rank order was prepared. Two identical groups were randomly framed on the basis of even and odd numbers in such a way to associate both the groups according to their BMI. One group was labeled as the Experimental Group (EG) n=15 and the second group was labeled as the Control Group (CG n=15).

## Research Instrument

For registering the measurements and personal data of the subjects, the researcher designed a chart in order to measure the anthropometric variables, including age, height and weight. For the purpose, the subjects were asked to mention their age. Measures of Height and weight were recorded with the help of Stadiometer. For three site skin fold measurements (Triceps, Suprailic and Thigh Muscles) Skin

Fold Caliper was used to determine the body fat percentage of the subject.

## Pre-test

Keeping in view the related studies pre-test was designed which focused age, height, weight and three Sites Skin Fold measurements. All the qualifying forty subjects underwent pre-test and their age, height, weight and three Sites Skin Folds were measured and recorded on the chart. Body Mass Index (BMI) and Body Composition were computed by standardized formula devised by (AdolpheQuetelet in the 1900's) for calculating the Body mass index of the individual subject weight (Kg) was divided by their height (m) 2. For 3-site skin fold measurements Triceps, Suparilic, and Thigh muscles were measured with the help of Skin Fold Caliper. Participant were required to remove shoes and heavy outfit before the measurements of height and weight. Measurements of each participant were taken by the same evaluator/investigator. The data were recorded and tabulated very carefully for analysis. On the basis of variables body mass Index and body fat percentage of every subject was determined.

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

## Research Protocol

A four (04) week exercise protocol which could meet the set objectives of the study was designed and used among females of experimental group. The experiment of aerobic exercises spread over duration of four weeks and applied only on the experimental group (n=15). The control group (n=15) was given no treatment. Aerobic exercises were selected and four weeks' exercises protocol was formulated to treat the experimental group. A total of four weeks' program was formulated having four training day and three resting days on alternate basis in each week. The recommended detailed program is given in the exercise protocol.

## Post-test

The experimental group was subjected to measure the anthropometric as well as 3-site skin fold measurements after the treatment of four weeks' exercise protocol.

## Statistical Analysis

The data regarding pre-test of all the subjects were coded and entered into computer carefully. The Body Mass index and body fat percentage of each subject was computed. The data regarding post-test of both groups-control and experimental were carefully recorded and entered into the computer for analyses. For this purpose, both descriptive (mean and standard deviation) and inferential statistics (Independent Samples t-Test and Paired Samples t-Test) were used for analyzing the data.

## RESULTS

Descriptive analysis:

**Table 1.** Pre-Test-Anthropometric and 3- site skin fold Measurements (n=30)

Parameters	(CG) Mean $\pm$ SD	(EG) Mean $\pm$ SD	p-value
Age	23.55 $\pm$ .992	32.9 $\pm$ 1.64	0.008
Height (Inches)	63.85 $\pm$ 1.65	64.9 $\pm$ 2.44	0.645
Weight (kg)	75.2 $\pm$ 4.98	74.08 $\pm$ 6.47	0.509
Body Mass Index (kg/m) <sup>2</sup>	29.78 $\pm$ 2.48	29.88 $\pm$ 2.37	0.511
Body Fate Percentage	28.58 $\pm$ 2.78	29.13 $\pm$ 3.96	0.513

## Significant at 0.05 level

## EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

Data regarding anthropometric characteristics and 3-site skin fold Measurements of Thirty (30) participants are shown in the above table. According to the table 1, the mean age, height and weight of the control group were  $23.55 \pm .992$  years,  $63.85 \pm 1.65$  and  $75.2 \pm 4.98$  respectively. Whereas, the mean age, height and weight of the experimental group were  $32.9 \pm 1.64$ ,  $64.9 \pm 2.44$  and  $74.08 \pm 6.47$ . Based upon the above measurements, the mean values of the body mass index of control and experimental group were calculated ( $\text{Kg/m}^2$ )

$29.78 \pm 2.48$  and  $29.88 \pm 2.37$ . Likewise, 3-site skin fold measurements of both the groups were recorded by Skin Fold Caliper and mean values were obtained as  $28.58 \pm 2.78$  and  $29.13 \pm 3.96$ .

To find out the difference in pre-test of control group and experimental group in terms of body mass index and body fat percentage, t-test was applied and the results has showed that there was no statistical significant difference between the two groups ( $P > 0.05$ ).

**Table 2.** Pre and Post-test results of Control Group (CG) and Experimental Group (EG) in Body Mass Index

Variable	Control Group (CG)	Mean	SD	t-value	P-Value
Body Mass Index	Pre-test	38.78	3.26	0.856	0.392
	Post-test	38.86	3.21		
Variable	Experimental Group (EG)	Mean	SD	t-value	P-Value
Body Mass Index	Pre-test	29.74	3.26	21.56	0.003
	Post-test	26.64	3.62		

### Significant at 0.05 level

The above table 2 revealed the mean difference in Pre and Post-test results of Control Group (CG) in term of Body Mass Index. Accordingly, the data shown that the mean score of control group in pre and post-

test were found as 38.78 and 38.86. The t-value of the table is 0.856 and P-value is 0.392 which is higher than the significant level ( $P > 0.05$ ). Therefore, it is concluded that the difference between Pre and Post-test

## EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

of Control Group has shown no significant increase in body mass index. The table is also showing the mean difference in Pre and Post-test results of Experimental Group (EG) in term of Body Mass Index. The mean score of (EG) in pre and post-test for BMI were found as 29.74 and 26.64. The t-value

of the table is 21.56 and P-value is 0.003 which is lower than the significant level ( $P < 0.05$ ). Therefore, it is concluded that the difference between Pre and Post-test of Control Group has shown significant decrease in body mass index.

**Table 3.** Mean, Standard Deviation and 't' ratio of Post-test results of Control and Experimental Group in Body Mass Index

Group	Test	Mean	SD	t-value	P-value
Control	Post	38.86	3.21	-21.56	0.003
Experimental	Post	26.64	3.62		

### Significant at 0.05 level

The above table no 3 shows Mean, Standard Deviation and 't' ratio of Post-test results of Control and Experimental Group in Body Mass Index. According to the analyzed data the mean value of Post-tests regarding BMI of Control Group was 38.86 and Experimental Group was 26.64. The P-value 0.003 and t-value -21.56 in the table depict

the significant statistical difference between the two means of Control and Experimental Group in Body Mass Index ( $P < 0.05$ ). Henceforth, it is concluded the four weeks' aerobic exercise protocol has significant effect on overweight females in perspective of decreasing in their body mass index.



## EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

**Table 4.** Pre and Post-test results of Control Group (CG) in Body Fat Percentage

Variable	Control Group (CG)	Mean	SD	t-value	P-Value
Body Fat Percentage	Pre-test	28.18	4.12	-0.988	0.346
	Post-test	28.89	289		
Variable	Experimental Group (EG)	Mean	SD	t-value	P-Value
Body Fate Percentage	Pre-test	28.66	3.98	5.022	0.001
	Post-test	23.5	2.6		

### Significant at 0.05 level

The table 4 has reveals the mean difference in Pre and Post-test results of Control Group (CG) in term of body fat percentage. The mean score of control group in pre and post-test were found as 28.18 and 28.89. The t-value of the table is -0.988 and P-value is 0.346 which is higher than the significant level ( $P > 0.05$ ). Therefore, it is concluded that the difference between Pre and Post-test of Control Group has shown no significant increase in body mass index. From the analysis it can be said that sedentary life style among overweight females produced no significant difference during the duration of experimentation period.

The table is also showing the mean difference in Pre and Post-test results of Experimental Group (EG) in term of body fat percentage. The analyzed data have established that the mean score of (EG) in pre and post-test were found as 28.66 and 23.5. The t-value of the table is 5.022 and P-value is 0.001 which is lower than the significant level ( $P < 0.05$ ). Therefore, it is concluded that the difference between Pre and Post-test of Control Group has shown significant effects of aerobic exercises on body fat percentage of overweight females.

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

**Table 5.** Mean, Standard Deviation and 't' ratio of Post-test results of Control and Experimental Group in Body Fat Percentage

Group	Test	Mean	SD	t-value	P-value
Control	Post	28.89	2.89	-21.87	0.002
Experimental	Post	23.5	2.6		

## Significant at 0.05 level

The above table 5 is showing Mean, Standard Deviation and 't' ratio of Post-test results of Control and Experimental Group in body fat percentage. According to the analyzed data the mean value of Post-tests regarding body fat percentage of Control Group was 28.89 and Experimental Group was 23.5. The P-value 0.002 and t-value - 987 in the table depict the significant statistical difference between the two means of Control and Experimental Group in Body Mass Index ( $P < 0.05$ ). Hence, it is concluded that four weeks' aerobic exercise protocol has significant effect on overweight females in perspective of decreasing in their body fat percentage.

## DISCUSSION

In response to first hypothesis, the data revealed that aerobic exercise has positive impact on the body mass index of overweight females aging 22-27 years. It is

additionally proposed by the researcher that a human body needs a five-day practice in seven days, independent of what age group he/she is placed in. The same study has found that a normal exercise keeps our body fit as well as it helps in keeping up our body in a normal weight. In another study, indicated that that exercise expands the blood dissemination of the body and sets the individuals us up for the diligent work throughout the day (Cousins, 2000). Research suggested that short term exercise can avoid incessant ailments and other medical issues identified with lungs and heart (Mostert & Kesselring 2002). General practices help to fortify the heart and the bulk can increment and the weight can be controlled through daily aerobic exercise (Agarwal, 2012).

The second hypotheses revealed that the aerobic exercise has positive effects upon body fat control of overweight females

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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aging, which have been accepted by the analyzed data. These findings are supported by the findings of Halle et al.(1999) who found that taking part in any exercise and use of balance diet are the true benefactors which helps in losing body fat than depending on the calorie restriction. Exercise can avert or even inverse the effects of certain diseases while, another study has concluded that exercise let down blood pressure and the level of cholesterol, which in turn helps in the prevention of

## CONCLUSION

Obesity has become a worrying health and social issue. This present study examined this issue to assess the effects of aerobic exercise on body composition of overweight female aging 22-27 years in the vicinity of District Tonsa, Punjab. Accessing to the findings of the study there existed significant effects of four weeks' aerobic exercises with special reference to the body composition among overweight female aging 22-27 years on the targeted population. Likewise, the study has concluded that the aerobic exercise protocol also helps in decrease the ratio of body fat

heart attacks (Swain & Franklin 2006; Ciolac et al., 2008).

In summary, regular physical activity appears to confer a health benefit to the people. However, further research is necessary to examine its role in the prevention of different diseases. In particular, large RCTs evaluating the effectiveness of an exercise intervention are required to fully elucidate the importance of regular physical activity for the health status of patients with cancer.

percentage and body mass index but increase lean body mass.

It has also been concluded that there is a positive relationship between aerobic exercises and overweight women in order to reduce the value of fat in the body. It is consequently to say that aerobic exercise at some level and for a specific duration would be essential to preserve and maintain the complete fitness and anthropometric benefits of exercise among overweight women. A downward trend towards the ignorance of any physical exertion and take a high calorie diet will lead to increases in the value of fat in the body. This research has shown the

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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exercises protocol for those women who are cognizant about their health; they will easily execute the recommended protocol at their home. This study supports the worth of

aerobic exercise in the treatment of obese or overweight women also lighting the importance of aerobic on daily basis.

## LIMITATION AND FUTURE SUGGESTIONS

The present study was carried out among the university level students, the researcher is ambitious to inclusion of larger and diverse population would help in adding to the credibility of future research in this area. This study was conducted to assess the effects of aerobic exercise upon females.

Another study be conducted among males. This study was focused to assess the effects of aerobic exercise among age group of 22-27. Similar study may also be carried out on male of different age groups for the improvement in their fitness level of male for healthy society.

## ACKNOWLEDGEMENT

We are immensely grateful to all the study participants those who participated in the study.

## CONFLICT OF INTEREST

No conflict of interest has been found in the study.

# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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# EFEKAT AEROBNIH VJEŽBI NA TJELESNU GRAĐU ŽENA SA PREKOMJERNOM TEŽINOM; NADAHNJUJUĆI STUDENTE DA VJEŽBAJU I IMAJU KVALITETNIJI NAČIN ŽIVOTA

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## SAŽETAK

Istraživanje je provedeno sa ciljem procjenjivanja efekata programa aerobnih vježbi na tjelesni sastav žena sa prekomjernom tjelesnom težinom u dobi od 22 do 27 godina. Uzorak od 30 žena sa prekomjernom težinom u dobi od 22 do 27 godina iz okruga Tonsa (Pandžab), Pakistan bio je uključen u istraživanje. Program vježbanja od četiri sedmice pripremljen je i proveden sa ispitanicama eksperimentalne grupe. Eksperimentalna grupa je podvrgnuta mjerenju antropometrijskih, kao i mjerenja kožnih nabora (3 nabora). Podaci izmjereni prije i poslije programa (kod kontrolne i eksperimentalne grupe) su pažljivo zabilježeni kao baza podataka. Za dobijanje valjanih zaključaka korištene su deskriptivna (srednja i standardna devijacija) i inferencijalna statistika (nezavisni uzorak t-test i upareni uzorak t-test).

Analizom podataka utvrđeno je da je srednja ocjena (EG) prije i poslije programa iznosila 28,66 i 23,5. T-vrijednost tabele je 5,022, a statistička značajnost 0,001 - što je niže od nivoa značajnosti ( $P < 0,05$ ), pa se zaključuje da je razlika između prije i poslije pokazala značajne efekte aerobnih vježbi na postotak tjelesne masti kod ispitanica kontrolne grupe. Prema analiziranim podacima, srednja vrijednost post-testova u pogledu postotka tjelesne masti kontrolne grupe iznosila je 28,89, a eksperimentalne grupe 23,5. Statistička značajnost 0,002 i vrijednost  $t = -987$  u tabeli prikazuju značajnu statističku razliku indeksa tjelesne mase ( $P < 0,05$ ) kod ispitanica kontrolne i eksperimentalne grupe. Dobijeni rezultati su ukazali na to da su aerobne aktivnosti tokom četiri sedmice vježbanja imale značajan efekat na ispitanice sa prekomjernom težinom u smislu smanjenja postotka njihove tjelesne masti. Na osnovu dobijenih rezultata, preporučuje se da se žene sve više uključuju u fizičke aktivnosti i vježbanje.

**Ključne riječi:** efekat, aerobno vježbanje, tjelesna kompozicija, prekomjerna težina, studenti, kvalitetniji život.

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**Received:** 26.06.2020.  
**Approved:** 21.09.2020.

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