THE EFFECT OF THE 8-WEEK FITNESS WORKOUT PROGRAM ON THE BODY CIRCUMFERENCE AND MOTOR ABILITIES

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Abstract

The purpose of the paper was to present the effect of the 8-week workout program on the body circumference and motor abilities. The samples represented 41 students, of which 19 were men and 22 were women and were in the academic year 2015-16 regularly enrolled in the optional course ECTS Fitness. Before and after the program we performed measurements of standardized anthropomorphic and fitness tests. Data was processed using the SPSS for Windows program. We found out that the 8-week fitness workout program had a positive effect on reducing the body's circumference in the abdomen and hips, and that the results in fitness tests which measure flexibility, power endurance and overall stamina were improved. We confirmed all this results at the level of 5% of statistical significance ($p \le 0.05$). We found out that this type of program could be an effective mean for improving the body circumference and motor abilities.

Keywords: workout program, body circumference, motor abilities, effect, fitness, students.

Introduction

We performed for the students in the optional course ECTS Fitness in the academic year 2015-16 an eight-week workout program. The program was running in the Center for University Sport of the University of Ljubljana. The purpose of the program was to prepare enrolled students in ECTS Fitness course for a more demanding fitness workouts and exercises. The aim of the practical part of the course is to enable the students for the proper use of fitness machines and accessories (elastics, bands, balls, slides, bars/sticks, ropes, kettle bells, etc.) as substitutes for the use of classical fitness machines. The aim of the theoretical part of the course is that students acquire knowledge of the use of various methods for developing flexibility, power and stamina. At the beginning of the course, for the first eight weeks, we carried out a fitness workout program with own body mass. The program was prepared following the recommendations of the World Health Organization (WHO, 2009, 2010, 2019) on physical activity.

The purpose of this paper was to present the effect of the 8-week fitness workout program on the student's body circumferences and motor abilities.

Methods

Description of performance

We performed the fitness workout program from November 2015 to January 2016 at the ECTS Fitness course at the Center for University Sport at the University of Ljubljana. In November 2015 we performed measurements of the initial state of the body circumferences, power endurance, flexibility and stamina. Then followed the 8-week fitness workout program. We performed the program as 90-minute weekly meetings. During the eight meetings, the professor presented a worksheet with carefully chosen gymnastic exercises. At the meetings, students learned to properly implement the gymnastic exercises for power endurance and flexibility. The selected gymnastic exercises students performed in the form of a 30-minute workout. They received instructions to carry out that type of fitness workout at least three times a week. An additional instruction for them was also to carry out a twice a week a 45-minute aerobic activity in nature (running, walking, cycling ...). After eight weeks, in January 2016, we measured the final state.



Figure 1. Worksheet 1 (In Slovenian)

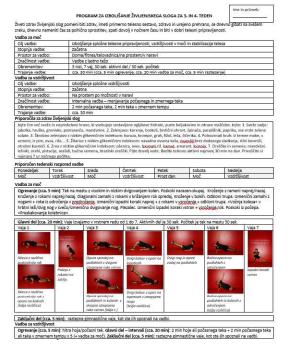


Figure 2. Worksheet 2 (In Slovenian)

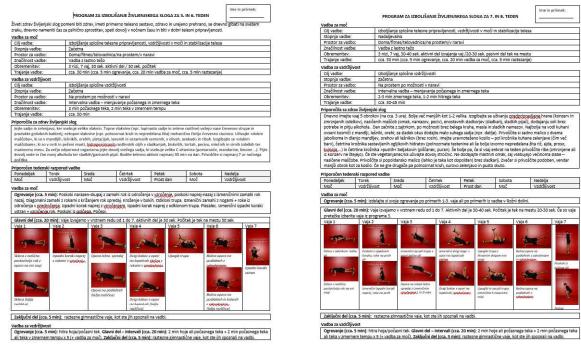


Figure 3. Worksheet 3 (In Slovenian)

Figure 4. Worksheet 4 (In Slovenian)

Figures 1 to 4 show the work sheets that received the students.

Subjects

Students were regularly enrolled students in undergraduate programs at various members of the University of Ljubljana.

Sample	М	ale Female	Mage	SDage	Age range
Initial state	34 (3	32 %) 37 (35 %) 21,21	1,748	19 - 22
Final state	21 (2	20 %) 26 (24 %) 21,20	1,618	19 - 22
Total	19 (4	46 %) 22 (54 %) 21,22	1,666	19 - 22

Table 1. Characteristics of the sample

Legend: Mage - median age; SDage - standard deviation age.

Table 1 shows the number of students enrolled in the study. According to comparative studies, we collected a relatively large sample, i.e. 41 persons, of which 19 (46%) were men and 22 (54%) female.

Accessories

Changes between the initial and final measurements in body composition were measured by standardized anthropometric measurements for the abdomen, waist and hip circumference in centimeters (Coburn and Malek, 2012). As shown in Table 3, the motor abilities were measured with standardized fitness tests (Coburn and Malek, 2012; Gray Cook, 2010; Mackenzie, 2005).

Motor ability	Fitness test	Result	
Flexibility	Sit and reach test(Coburn in Malek, 2012)	Maximum movement range in cm	
Power end.	Squat test (Mackenzie, 2005)	Maximum number of repetitions	
	Push uptest (Mackenzie, 2005)	Maximum number of repetitions	
	Partial curl uptest (Coburn in Malek, 2012)	Maximum number of repetitions	
Stamina	YMCA step test (Coburn in Malek, 2012	Heart rate in 60 sec.	

Table 2. Standardized fitness tests that were used in the study

Legend: cm - centimeter; Power end. - power endurance.

The flexibility was tested by sit and reach test (Coburn in Malek, 2012); the legs power endurance was tested with squats (Mackenzie, 2005); the hand and chest power endurance was tested with push uptest (Mackenzie, 2005); the core power endurance was tested with partial curl uptest (Coburn and Malek, 2012). Overall stamina was tested with a 3-minute YMCA step test (Coburn and Malek, 2012).

Data analysis

The data are presented with median and standard deviations. Statistically significant differences between variables were calculated with the t-test for independent samples. The statistically significant difference was confirmed at the level of 5% ($p \le 0.05$). Data were processed with the SPSS statistical program (version 15.0, SPSS Inc., Chicago, USA).

Results

 Table 3. Waist, abdomen, hip circumference and waist/hip ratio – differences between initial and final measurement

Variables	M1	M2	SE	t	df	р
Waist circumference (in cm)	77,34	76,91	0,26	1,68	37	0,101
Abdomen circumference(in cm)	85,79	83,22	0,44	5,84	37	< 0,001
Hip circumference (in cm)	99,11	97,06	0,60	3,40	37	< 0,05
Waist/hip ratio (with coefficient)	0,79	0,78	0,01	-2,29	37	< 0,05
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Legend: M1 – median initial; M2– median final; SE – standard error; t – t test; df – degrees of freedom; p – statistical significance ($p \le 0.05$), cm – centimeter.

Table 3 shows the differences between the initial and final measurements for the waist, abdomen, hip circumference and waist/hip ratio. In all measurements (except waist circumference), we found out statistically significant differences between the initial and final measurement. We found out that during the implementation of the program students statistically significantly decreased the abdomen ($p \le 0.001$) and the hip circumference ($p \le 0.05$). The waist/hip ratio was also statistically significant reduced ($p \le 0.05$).

Fitness test	M1	M2	SE	t	df	р
Sit and reach test (cm)	43,00	46,12	0,52	-6,03	40	< 0,001
Squat test (№)	75,40	91,40	2,33	-6,85	39	< 0,001
Push up test (№)	15,47	20,61	0,65	-7,85	35	< 0,001
Partial curl up test (№)	54,53	90,70	9,85	-3,67	39	< 0,001
YMCA step test (Hrate 60)	127,35	120,18	1,48	4,85	39	< 0,001

Table 4. Fitness tests - differences between initial and final measurement

Legend: M1 – median initial; M2– median final; SE – standard error; t – t test; df – degrees of freedom; p – statistical significance ($p \le 0.05$), cm – centimeter; N \ge -number of repetitions; Hrate 60 – hart rate beats in 60 seconds.

Table 4 shows the differences between initial and final measurements in fitness tests. In all measurements, statistically significant differences ($p \le 0.001$) were found. The result of the Sit and reach test was improved for +3.12 cm; the result of the Squat test for +16 repetitions; the result of the Push up test for +5.14 repetitions; and the result of the Partial curl up test for +36.17 repetitions. The students improved the overall stamina measured with the YMCA step test by heart rate beats for -7.17 beats.

Conclusions

The findings show that the 8-week fitness workout program had a positive effect on reducing the body's abdomen and hip circumference. The results in fitness tests were also improved. On the basis of the findings, we recommend the implementation of such programme for the persons, who want to reduce abdomen and hip circumference and improve flexibility, power endurance and stamina.

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