

"STEP" PROGRAM - A MEANS TO FIGHT OBESITY

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Abstract: *The Step program is in line with the physical activities preferred to accelerate the process of reducing or maintaining body weight, these being some of the main problems the modern era is facing. Frequently, modern society comes up with a series of revolutionary programs as main focus, that can be used in the fitness world, programs that permanently contribute to improving the quality of life from all points of view.*

Key words: *Step program, fitness, obesity, workout.*

1. Introduction

Daily physical activities bring about obvious advantages when it comes to health and they also significantly contribute to diminishing the risk of illness. At the same time, a superior physical condition substantially reduces the risk of illness and increases the ability to work and also leads to an overall better physical and mental well-being [1, 2].

According to specialist Ioan Trifa, "physical activity, physical condition and health are going to influence one another. Thus, physical activity can influence physical condition, which in turn, can modify the level of typical physical activities. Additionally, physical activity and physical condition will have their own influence on the overall health, which, in turn, can influence the typical level of physical activities and physical strain, thus

being able to trigger various transformations in the physical condition sphere" [11, p.9,10].

1.2. The Step Program

The stepper is a platform with a width of approximately 40 cm and a length of 1 m, which can be adjusted in height (from 10 cm to 25 cm).

Step sessions include a series of dynamic physical exercises, which involve going up and down on the stepper at a constant rhythm defined by music. At the same time, it is very important to exercise during the song, and not only on its rhythm. The use of rhythm determines the type of movement and the way it fits within the music, leading to a greater auditory and sensory capacity, greater concentration, attention, expressiveness [7].

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The rhythm represents the ratio between the number of moves and the time unit. If it is too fast, the knee joints are not going to adequately stretched, leading to incomplete moves. If the music rhythm is too high, the individuals can switch from an aerobic workout to an anaerobic workout.

The physical activity performed on the stepper helps improve the cardiovascular system and render it more efficient and at the same time influences the tonic-trophic state of the lower limbs through a high intensity workout [4], [7].

2. Material and Methods

2.1. Workout principles

The characteristics of step are:

- finishing an aerobic workout at a medium-high intensity;
- the possibility to change intensity, increasing the height of the stepper by adjusting it or by performing propulsion exercises;
- easy implementation of the workout with simple steps and consistent repetitions;
- creating a perfectly balanced program;
- popular activity performed both by men and women;

Precautions when using the platform:

- the entire sole of the foot must be placed on the inside of the platform during the execution of the support steps;
- when the first leg is on the stepper and the other one is still on the ground, the body must form a diagonal line from the head to the heel of the back foot;
- we must be aware of our position at all times and constantly maintain a visual contact with the stepper;
- getting down from the stepper in front of it with your back facing it must be avoided;

There are some fundamental rules in order to avoid any physical harm brought

to the individuals using the stepper, thus being true application parameters in order to maximize the benefits and reduce to a minimum the eventual risks.

• **Correct posture:**

- shoulder must be relaxed;
- the torso must be aligned with the rest of the body;
- hyperextension of the knee must be avoided during the step-up phase using a natural bending of the lower limbs;
- supporting the entire sole of the foot on the inside of the platform during the execution of the steps;
- in the step-down phase one must remain close to the platform;
- one should never sit with the back facing the stepper;
- rotation movements on the support leg are avoided when it is supported on the stepper;
- a propulsion phase is introduced if the choreographic moment includes a twist in the final part;
- never "push against" the stepper when stepping on it;
- avoid multiple repetitions using the same limb;

• **Height of the platform:**

There are three factors which must be taken into consideration when correctly evaluating the stepper's height:

- a) The subject's height;
- b) The age;
- c) The level of technical training;

It should be remembered that during the step-up phase the angle formed between the calf and the thigh should not be less than 90 degrees because otherwise the knee joints will be excessively strained and, implicitly, an overstrain at a lumbar level will occur.

- the platform without any sort of additions - for beginners;
- a small ladder of 15 cm - for an intermediate level;

- two small ladders of 20 cm - for an advanced level of training;
- three small ladders of 25 cm - for highly trained or very tall subjects;

- **Cardiac control:**

- In order to control the intensity of the physical exercise with the help of heartbeats the participant can touch the carotid artery with two fingers or press with the right thumb under the left thumb, exactly on the upper part of the wrist, counting thus the number of pulsations for 10 second, and then multiplying that number by six [34, p.2].
- In the same article „*Development of physical skills through step aerobics programs*“, written by Chicomban C.M., the target zone table is presented, which provides information on checking the number of heartbeats to see if the workout is carried out within the frequency range adapted to the subject's age [7].

2.2. Step Session Structure

A step session is divided as follows:

- a) Warming up;
- b) Specific Part;
- c) Stretching.

The session can last between 75'/60'/50'/40' and varies based on the type of programme desired. They have as goal improving the local muscular endurance (LME) of the main muscle groups.

- a) - it lasts between 8 and 10 minutes;
 - it consists of dynamic physical exercises, general joint exercises, static isometric exercises (based on the objective set for the session);
- b) - it is the part of the session that applies the methodological objectives set in the weekly programme;
 - it lasts between 30 and 40 minutes;

- it consists of functional exercises for the lower and upper body parts, with our without using accessories;
- c)- it lasts between 5 and 8 minutes;
- the content of this part includes:

- ❖ introducing a mental state of relaxation through breathing exercises that can be performed along with movements of the body or combinations thereof;
- ❖ the overall stretching that has been performed and the warming up part of the session, done mainly on the muscular and joint groups strained during the fundamental part [3].

In conclusion, the Aerobic Step sessions are workouts with an intermediate level of difficulty, suitable both for persons who have just started going to the gym and for the advanced ones.

2.3. The Purpose of the Proposed Pedagogical Experiment

The purpose of the pedagogical experiment is to prove that, through the correct systematized and individualized application of the STEP means, visible and significant results will be obtained in reducing obesity, which will benefit the achievement of the paper's objectives. The goal of the program is related to movement, improvement of health and physical appearance and even, improvement of the motion and physiological ability.

In the pedagogical experiment we evaluated a number of 5 motion tests specific to the step program which are: strength of the upper limbs - push-ups with support on the stepper; strength of the abdominal muscles - crunches on the stepper, from a supine position; the cardio test - jumps from one leg to the other over the stepper which is in an vertical position; the Ruffier test; Harvard test.

3. Results

Table 1
Presenting the results from the motion test - the strength of the upper limbs - push-ups with support on the stepper

Crt. no.	Initials	Gender	Initial test 07-01-2019	Final test 12-03-2019
			Push-ups (30")	Push-ups (30")
1	R.A.	M	15	18
2	C.M.	M	19	23
3	G.R.	M	15	17
4	J.D.	M	17	21
5	T.V.	M	19	22
Arithmetic mean			17	20.2
Standard deviation			2	2.58
Coefficient of variation			3.2	5.36

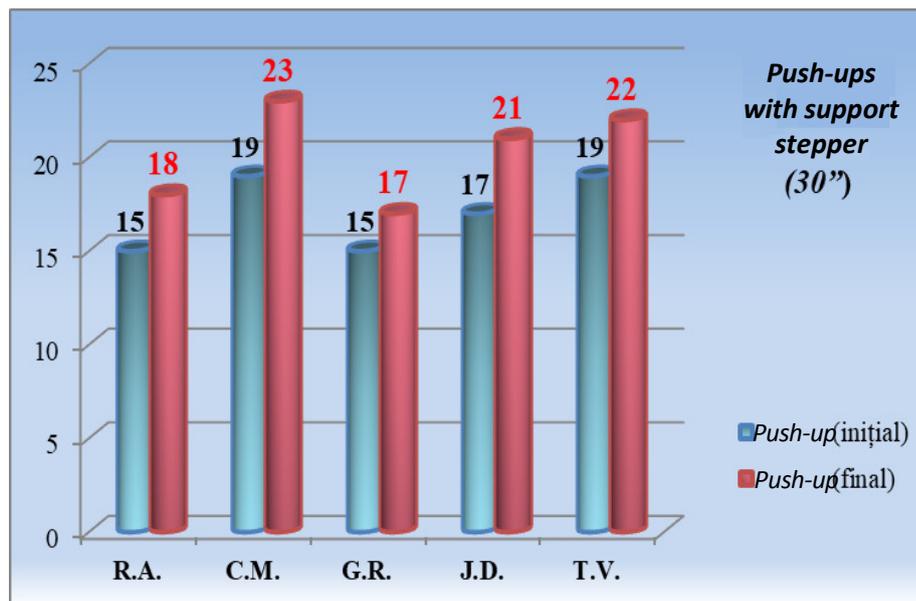


Fig. 1. Evaluation chart of the upper limbs strength

3.1. Interpretation of the Results

The push-ups with support on the stepper are performed with the apparatus being in a vertical position, face lying down with the palms on it, torso must be straight, lower limbs slightly apart.

The subjects had to perform as many correct push-ups during 30"; thus, in the above chart a positive difference can be observed in what concerns the mean value of 3.2 from the initial test (17) and the final one (20.2). Each one of them

managed to increase the number of push-ups during the three months of training.

Table 2

Presenting the motion test results - strength of the abdominal muscles - crunches on the stepper from a supine position

Crt. no.	Initials	Gender	Initial test 07-01-2019	Final test 12-03-2019
			Crunches (30")	Crunches (30")
1	R.A.	M	27	29
2	C.M.	M	28	34
3	G.R.	M	21	25
4	J.D.	M	23	26
5	T.V.	M	27	34
Arithmetic mean			25.2	29.6
Standard deviation			3.03	4.27
Coefficient of variation			7.36	14.64

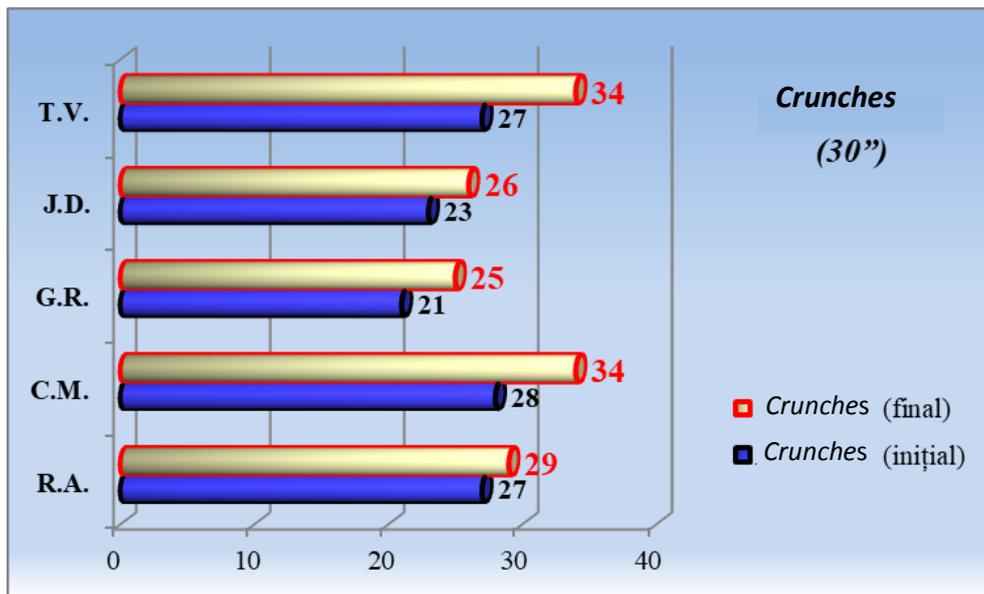


Fig. 2. Evaluation chart of the upper limbs strength

3.2. Interpretation of the Results

The crunches from this test were performed from a supine position on the stepper, palms to the cervix, lower limbs flexed and the feet pointing forward,

towards the ground. The subjects lift themselves up to 45°.

In the above chart it can be observed that all the subject experienced a significant increase in the number of crunches, with a mean value of 4.4 from

the initial test (25.2) to the final test (29.6).

At the first test, the standard deviation was of 3.03, whilst at the final one it was of 4.27. The coefficient of variation, the one

that shows the homogeneity in the group of subjects, experienced a difference of 7.28%, from one test to another.

Table 3

Presenting the cardio test results - jumps from one leg to the other over the stepper which is in a vertical position (30 ")

Crt. No.	Initials	Gender	Initial test 07-01-2019	Final test 12-03-2019
			Jumps (30")	Jumps (30")
1	R.A.	M	32	35
2	C.M.	M	35	39
3	G.R.	M	29	33
4	J.D.	M	33	37
5	T.V.	M	35	40
Arithmetic mean			32.8	36.8
Standard deviation			2.48	2.86
Coefficient of variation			4.96	6.56

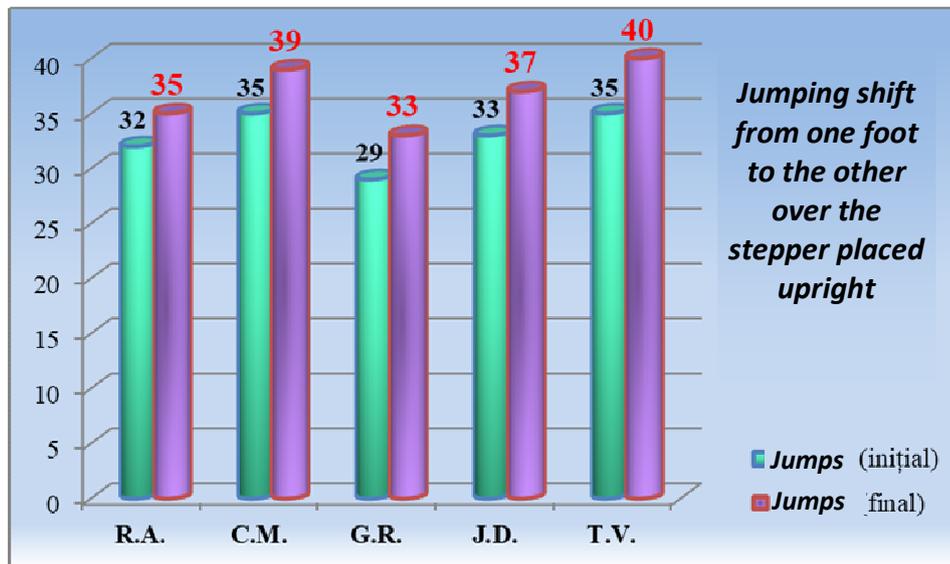


Fig. 3. Evaluation chart for the cardio test

3.3. Interpretation of the Results

Jumps from one leg to the other over the stepper which is in a vertical position, represent one of the cardio exercises

included in the workout sessions which the subjects have performed during the study. They help improve the health of the heart and of the cardiovascular system, being efficient in burning fat.

At the beginning of the workout sessions, the subjects performed this resistance exercise as a test, where they obtained a mean value of 4 jumps, from the first test (32.8) to the last one (36.8), as shown in the above chart (fig. 4).

The initial standard deviation was of 2.48 and the final one was of 2.86; the initial coefficient of variation was of 4,96% and the final one was of 6,56%.

Presenting the Ruffler test results

Table 4

Crt. no.	Initials	Gender	Initial test 07-01-2019				Final test 12-03-2019			
			P 1	P 2	P 3	P. F.	P 1	P 2	P 3	P. F.
1	R.A.	M	72	88	80	4	74	90	80	4.4
2	C.M.	M	76	96	88	6	74	94	86	5.4
3	G.R.	M	80	112	88	8	78	108	96	8.2
4	J.D.	M	76	92	88	5.6	78	96	90	6.4
5	T.V.	M	84	112	92	8	80	106	94	8
Arithmetic mean						6.32	Arithmetic mean			6.48
Standard deviation						1.7	Standard deviation			1.64
Coefficient of variation						2.32	Coefficient of variation			2.15

Legend: The interpretation is done according to the index value:

- P1 = resting pulse; values smaller than 0 (negative) = very good
- P1 = effort pulse; values smaller than 0 (negative) = very good
- P3 = recovery pulse; values between 5-10 = medium;
- P.F. = final pulse. values between 10-15 = satisfactory;
- values over 15 = unsatisfactory.

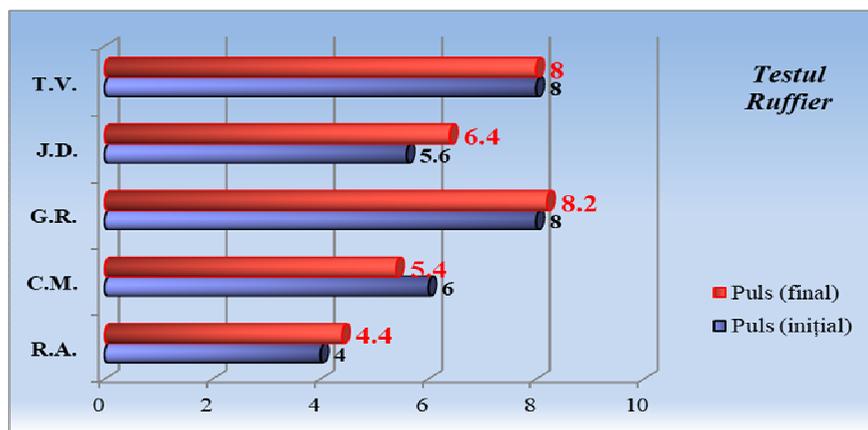


Fig. 4 . Chart of the final pulse values - Test Ruffier

Interpretation of the Results

The Ruffier test is a test to evaluate the functional capacity of the cardiovascular and respiratory systems. The Ruffier test is a submaximal effort test based on heart

rate measurement, which is usually carried out on individuals who lack physical training, being relatively risk-free.

Technique: the subject is in a "sitting" position, the pulse is taken for 15 seconds,

which multiplied by 4, gives the constant P1 (resting pulse); the subject then performs 30 sit-ups for 45 seconds, then sits in the initial position; the pulse is measured for 15 seconds between seconds 0-15 post effort, which multiplied by 4, gives the constant P2 (effort pulse); the subject remains seated for 1 minute, and between seconds 45-60 of this post-effort minute, the pulse is measured again for 15 seconds, which multiplied by 4,

gives the constant P3 (recovery pulse) [10, p.67].

After the subjects had their results recorded as a result of the test, both initially and after the end of the three months of training, it can be seen in the above chart that only two of the five subjects experienced an improvement in the functional capacity of the respiratory and cardiovascular systems, ranking a good score, while the other three fall under the average score.

Presenting the Harvard test results

Table 5

Crt. No.	Initials	Gender	Initial test 07-01-2019				Final test 12-03-2019				
			X	Y	Z	P.F.	X	Y	Z	P.F.	
1	R.A.	M	90	80	72	61.98	86	74	70	65.21	
2	C.M.	M	84	76	70	65.21	80	74	68	67.56	
3	G.R.	M	104	96	82	53.19	92	86	80	58.13	
4	J.D.	M	86	72	68	66.37	86	68	62	69.44	
5	T.V.	M	78	72	70	68.18	78	68	64	71.42	
Arithmetic mean						62.98	Arithmetic mean				66.35
Standard deviation						5.92	Standard deviation				5.13
Coefficient of variation						28.06	Coefficient of variation				21.11

Legend: – X = pulse 1 minute after finishing the test;
 – Y = pulse 2 minutes after finishing the test;
 – Z = pulse 3 minutes after finishing the test;
 – P.F. = final pulse (physical condition index - fitness index).

Calculation formula: $(100 \times \text{test duration in seconds}) : (2 \times \text{sum of the three pulses}) = \text{IF}$

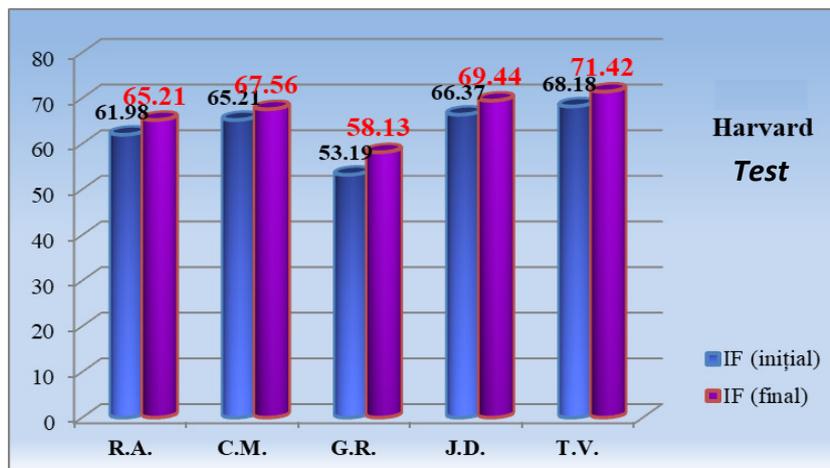


Fig. 5. Graphical representation of the fitness index – Harvard test

4. Conclusions

The Harvard test is a maximal effort test, based on heart rate measurement during the recovery period after effort. It is generally used to study the behaviour of the cardiovascular system during intense efforts. The interpretation is done according to the physical aptitude index value, as follows:

- under 55 = poor physical condition;
- 55 - 79 = average physical condition;
- 80 - 89 = good physical condition;
- over 90 = excellent physical condition;

As a result of the test, the scoring and the graphical representation it is observed that the subjects fall under the 55-79 index value from one test to another with a few hundredths. In this sense, based on coherent arguments, supplemented by accurate statistical and mathematical calculations and analyses, we draw the following conclusions:

1. The results of the research contribute to the confirmation of the hypothesis, namely - by implementing the "step" program, as a means for fighting obesity, positive effects will be obtained in losing extra weight and in the fight against obesity from an early age.
2. The results recorded by the subjects were superior at the final test, compared to the initial test, which confirms the fact that this action means specific to fitness, the "step" program, with carefully selected workout sessions and applied during the three months of research, three times a week, improved the physical state of the 5 subjects. However, in order to experience a continuous positive change, more time should be spent for the workout sessions included in this program or if not, the number of workout sessions per week should be greater.

3. The functional capacity of the subjects improved considerably from one test to another, which confirms the fact that the physical trainings specific to the "step" program were adequately applied based on the age particularities and efficiency criterion.

- the effort cardiac capacity determined through the Ruffier Test recorded an evolution in the results, from the initial test to the final one, due to implementing the operational program. From the rating scale to the average-level, there was a significant statistical increase in value, with a difference in the arithmetic means between tests of 0.16;

- as a result of the Harvard test, the level of the physical fitness index (IF) - a fundamental parameter of the functional capacity - registered a progress from one test to another. From the level of poor to average physical condition, they achieved at the final test the "average" level, which determines the fact that the cardio-type workouts contributed decisively to the progress of the five subjects.

4. An important finding refers to the motion potential of the five participants in this research, where a series of tests were applied, representing the evaluation of the strength of the upper limbs, the lower limbs, the abdominal muscles. The progress from the initial to the final test was suggestive, due to the fact that during the training sessions there was a focus on working out more intensely these three parts of the body.

The tests applied were successful, the subjects achieving their goals during the set period of time. Thus, if the workouts pertaining to this program are to be continued, the results will be more visible from a physical standpoint, thus managing to prevent obesity in time.

Synthesising the analysed and processed data, in the present paper, focused on the component of fighting against obesity in individuals at an adult age and the following recommendations were emphasised:

- Using the "step" program will be a core foundation in fighting against obesity, which represents a major problem when it comes to the public health.
- Participation in the step - aerobic classes should be done with a specialized instructor, keeping the specific means of working on a stepper, during the three months of training.
- The gradual introduction of the actions means specific to the fitness-aerobic modern methods - vigilantly and specifically designed for each individual.
- Besides planning, designing and organizing the physical education lessons in schools, a positive interest should be allotted to scheduling more aerobic gymnastics lessons, which provides for raising an interest toward physical exercise.
- Besides physical activities, approaching a balanced diet, in order to maintain the optimal weight standard.
- Performing periodical tests in order to monitor the progress of the body weight evolution.
- We consider that, once the young generation realizes the benefits of a healthy way of life, we will contribute to a positive change in their mentality, physical appearance and mental state.

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