

Study Regarding Fitness Improvement Using Step Aerobics Programs

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Abstract

Step aerobics represents an efficient and pleasant alternative for achieving fitness. Through its contents, this type of activity contributes to developing resistance, strength of lower body muscles and, not least, coordination.

The purpose of this paper is to note whether – after practicing systematically the aerobic effort using step aerobics programs – muscles become more toned, joint mobility and muscle elasticity increase and whether balance and motor memory improve.

The hypothesis of the paper was the following: by using the step aerobic program, we can improve the fitness of people who practice this type of physical activity.

The sample within our research comprised 30 women aged between 20 and 35. The study was conducted throughout a year and trainings took place three times a week. The step aerobic sessions lasted for 60 minutes. The tests applied to the research sample were as follows: test for abdominal and arm muscle strength and resistance; assessment of spine mobility in anterior plane; balance test; push-ups; and motor memory.

Findings

The values of mean and of standard deviation in the test for *abdominal and arm muscle strength and resistance* improved from 8.2 ± 2.97 in the initial testing, to 13.00 ± 1.94 , while the variability coefficient dropped from 36.21% to 14.92%. In the test for *joint mobility and muscle elasticity*, the values increased from 22.8 ± 5.91 to 28.9 ± 4.92 , while the variability coefficient de-

creased from 25.93% to 17.05%. Regarding the balance test, values recorded a progress from 2.8 ± 0.78 balance losses to 1.2 ± 0.48 , while homogeneity improved from 27.85% to 15.70%. As for the test of *arm muscle strength*, values augmented from 6.3 ± 1.63 initially to 8.8 ± 1.13 in the end, while homogeneity increased from 25.87% to 12.84%. Furthermore, the values of *motor memory testing* augmented from 4.3 ± 1.25 to 7.2 ± 0.78 , while homogeneity from 29.10% to 10.95%.

Conclusions

After processing and interpreting the results, we posit that step aerobic programs contributed to the fitness improvement of female practitioners; thus, the paper hypothesis was confirmed.

Keywords: motricity, fitness, aerobic

Introduction

Fitness is a concept with multiple meanings, depending on the cultural level and the professional training of the person employing it. It may be defined as the individual's capacity of attaining an optimal quality of life, which represents a dynamic, multidimensional condition based on a positive health status and it includes several components: intellectual, social, spiritual and physical fitness (Grosu et. al., 2010).

Fitness is a very broad term and has various concepts. Total fitness looks at the overall individual, combining the absolute levels of physiological, psychological, social and cognitive fitness (Kalidas & Tapas, 2016).

The equivalent of the term fitness is the defining of motor capacities. It designates a set of attributes through which an individual copes with the physical and functional demands of daily or sporting activities, depending on his anatomical, physiological and psychological condition (Ortanesu et al., 2007).

Inactivity among young people is a growing public health and educational concern. During the past several decades, people have become increasingly sedentary (Chaddock et al, 2011).

Physical inactivity and low physical fitness are determinant factors in the occurrence of certain diseases which are a major concern in today's society, as it is the case of obesity (Moliner-Urdiales et al., 2010; Ochoa et al., 2007; Rodriguez et al., 2008).

The benefits to be enjoyed from participating in a regular fitness and wellness program are many. In addition to a longer life, the greatest benefit of all is that physically fit people who lead a positive lifestyle have a healthier and better quality of life. These people live life to its fullest and have fewer health problems than inactive individuals who also indulge in negative lifestyle habits (Hoeger, 2011). Aerobic capacity and muscle strength are important indicators and predictors for disease and cardiovascular mortality risk (Balsalobrea, 2014).

Regular physical activities should be an integral part of an active lifestyle of human life. Programs including such activities are

more effectively being applied in the prevention and elimination of health problems, especially those that are the result of decreased movement, inadequate nutrition and excessive nervous tension (Halil et. al., 2014). An active life style increases energy, vitality, helps change bad habits, improves health, and strengthens one's energy and desire for life (Mavrić et al., 2014).

Physical fitness is defined as the ability of body to function efficiently and effectively, to enjoy leisure, to be healthy, to resist disease, and to cope with emergency situations. Health-related components of physical fitness included body-composition, cardiovascular fitness, flexibility, muscular endurance, and strength. Skill-related components included agility, balance, coordination, power, reaction time, and speed. Physical fitness is used in two close meanings: health-related which state the health and well-being and skill-related which more task-oriented based on the ability to perform specific aspects of sports or occupations (Tan Chee et. al., 2013).

Physical fitness involves most correctly performing physical education exercises, and it indicates the existing physical fitness of the body along with the physical endurance. (Uzunosmanoglu et. al, 2012) The components of fitness are as follows: body composition, mobility, strength, muscle and cardiovascular resistance (Nanu, 2009).

The fitness variables are important determinants of various health outcomes, and several specific biological mechanisms have been elucidated to confirm the causal relation of fitness variables to health (Blair et. al., 2001).

Scientific literature has firmly established the relationship between physical activity and health. Among the important reasons for assessing health-related physical fitness, are the following: educating participants about their health-related fitness status relative to health-related standards and age and sex matched norms; providing data that are helpful in the development of exercise prescriptions to address all fitness components; collecting baseline and follow-up data that allow evaluation of progress by exercise program participants; motivating participants by establishing reasonable and

attainable fitness goals; stratifying cardiovascular risk (Kaminsky, 2010).

Step aerobics is characterized by climbing, descending and crossing the sidelines with various steps related to interesting blocks performed with music. It is suitable for all practitioners, regardless of gender, age or physical condition. With activation of large muscle groups in legs and gluteal region, climbing up and going down is alternately performed with various movement structures (Nikić & Milenković, 2013).

Step aerobics has also improved upper body strength, because of its choreographies that involve dynamic movements of the arms. In addition, improvements in balance and agility have been shown in middle-aged and older adults because of the characteristic movements used in SA choreographies. Improvements in flexibility have been achieved by the range of motion required to perform the movements of SA choreographies and stretching exercises (Hallage et al., 2010).

Several studies noted that after various periods of step aerobics participants recorded significant improvements in physiological and motor performance parameters. For example, Nikić and Milenkovic (2013) noted that step aerobic practice significantly improved motor skills and body composition of young girls. Kraemer et al. (2001) found that step aerobic are an effective exercise type to improve physical fitness and body composition in healthy women (Bavl, 2016).

Material and method

The permanent desire to exercise and to practice a physical activity entails the ongoing diversification of action systems and of means for applying various programs. Starting from this assertion, we considered it useful to study this topic in order to attain the following objectives: maintaining health, modelling the body and improving fitness.

The purpose of this paper is to note whether – after practicing systematically the aerobic effort using step aerobics programs – muscles become more toned, joint mobility and muscle elasticity increase and whether balance, motor memory and spatial orientation improve.

The hypothesis of the paper was the following: by using the step aerobic program, we can improve the fitness of people who practice this type of physical activity.

The sample within our research comprised 30 women aged between 20 and 35. The study was conducted throughout a year and trainings took place three times a week. The step aerobic sessions lasted for 60 minutes and they were structured on three parts: warm-up - 25-30 minutes – comprising step structures specific to step-aerobic (basic step, step touch, V step, over the top, side to side, lunge, knee, kick, jumping - Jack, heel-up, etc); fundamental part (20-25 minutes), floor exercises with and on step (exercise for developing the abdominal, back, leg, arm muscles, exercise for developing joint mobility and muscle elasticity); ending part – 5-10 minutes – comprising exercises for relaxation, breathing, as well as stretching exercises.

In this research, we used several methods that represented ways to solve the proposed tasks. They were the following: documentary method, experimental method, tests method, statistical-mathematical method. The tests applied to the sample of our research were: test for abdominal muscle strength and resistance, for the assessment of spine mobility in anterior plane, balance test, push-ups and motor memory.

Results

We present below the results obtained at the tests applied to the sample within our research and the statistical-mathematical processing of data.

Table 1 Values obtained at the test for “abdominal muscle strength and resistance”

Statistical indicators	Initial testing (no. of executions)	Final testing (no. of executions)
Mean (X)	8.2	13.00
Standard deviation (S)	± 2.97	± 1.94
Variability coefficient(C.V.)	36.21%	14.92%

The Table above shows that the values of arithmetic mean and of standard deviation at the test for *abdominal muscle strength and resistance* improved from 8.2 ± 2.97 at the initial testing, to 13.00 ± 1.94 , while the variability coefficient dropped from 36.21% to 14.92%, thus obtaining better homogeneity.

Table 2 Values obtained at the test for “joint mobility and muscle elasticity”

Statistical indicators	Initial testing (cm)	Final testing (cm)
Mean (X)	22.8	28.9
Standard deviation (S)	± 5.91	± 4.92
Variability coefficient(C.V.)	25.93%	17.05%

In the test for *joint mobility and muscle elasticity*, the values of mean and of standard deviation increased from 22.8 ± 5.91 to 28.9 ± 4.92 , while the variability coefficient decreased from 25.93% to 17.05%, which proves better homogeneity.

Table 3 Values obtained at the test for “balance”

Statistical indicators	Initial testing (balance losses)	Final testing (balance losses)
Mean (X)	2.8	1.2
Standard deviation (S)	± 0.78	± 0.48
Variability coefficient(C.V.)	27.85%	15.70%

Concerning the balance test, the obtained values also show a progress of arithmetic mean and of standard deviation from 2.8 ± 0.78 balance losses to 1.2 ± 0.48 , while homogeneity increased from 27.85% to 15.70%.

Table 4 Values obtained at the test for “push-ups”

Statistical indicators	Initial testing (no. of executions)	Final testing (no. of executions)
Mean (X)	6.3	8.8
Standard deviation (S)	± 1.63	± 1.13
Variability coefficient(C.V.)	25.87%	12.84%

In the test for *arm muscle strength*, the values of mean and of standard deviation augmented from 6.3 ± 1.63 initially to 8.8 ± 1.13 in the end, while homogeneity improved from 25.87% to 12.84%.

Table 5 Values obtained at the test for “motor memory”

Statistical indicators	Initial testing (no. of executions)	Final testing (no. of executions)
Mean (X)	4.3	7.2
Standard deviation (S)	± 1.25	± 0.78
Variability coefficient(C.V.)	29.10%	10.95%

The values of mean and of standard deviation obtained in *motor memory testing* also recorded an improvement, from 4.3 ± 1.25 to 7.2 ± 0.78 , while the variability coefficient decreased from 29.10% to 10.95%, thus accounting for better homogeneity.

Discussions

Therefore, coaches of step aerobics should be aware of the consequences of the increase in the height of the platform or music

beat frequency, especially in the beginner groups (Błażkiewicz et al, 2016).

Santos Rocha suggests that most of the injuries in step aerobics are caused by an inappropriate music beat frequency, complex choreography, an excessive number of high-impact steps and improper step height. (Santos-Rocha, 2006).

Characterized by rhythmical movements on a bench, step aerobic is performed to cadenced musical arrangements and is easy to learn. The intensity of step aerobic can be adjusted easily and does not require special equipment, thereby accommodating the needs of an aging population. (Cai Z et al., 2014).

Numerous studies have indicated that step aerobic training can be a low-cost intervention and an effective strategy for improving functional fitness, sleep quality, and cardiovascular health, as well as for enhancing exercise adherence and promoting greater satisfaction, quality of life, and physical function in healthy older women. Compared to resistance training and running on a treadmill, step aerobic exercises more easily meet requirements in terms of facilities, space, and training protocols. Moreover, the protocols and intensity of step aerobic exercise programs can be simply modified to suit the target group (Harden et al, 2015).

Conclusions

After processing and interpreting the data obtained in the tests applied, we highlight the following conclusions: in the final testing, we noted a progress of strength indicators at the level of shoulder girdle and upper limbs, of abdominal strength indicators, of motor memory, of joint mobility and muscle elasticity indicators and of balance, compared to the same indicators obtained by the same group of subjects at the initial testing.

Considering the aforementioned aspects, we posit that step aerobic programs contributed to the fitness improvement of female practitioners; thus, the paper hypothesis was confirmed.

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