

THE INFLUENCE OF DANCE ON VO₂ MAX IN THE ACTIVITIES OF OVERWEIGHT STUDENTS

Research notes

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Abstract

During the last years, many studies warn about the increasing number of overweight people in different countries. Obesity is among the proven risk factors for cardiovascular diseases and premature death. These people are at great risk of developing diabetes type 2, hypertonia, dyslipidemia, coronary artery disease, stroke, sleep apnea, osteoarthritis, depressions and malignancies. Although this problem exists all over the world it is more common for regions with a higher lifestyle. In the last 20 years in Europe, the percentage of overweight people has increased from 10% to 40%. Related to this situation, the aim of this study was to identify and analyses the impact of dance activities on the maximum oxygen consumption of overweight and obese students.

The main objective of the study is to track the changes in the maximum oxygen consumption of the respondents as a result of practicing folk dances. The focus of the study is the indicators characterizing the heart rate and the maximum oxygen consumption (VO₂ max) of the students as a result of the rhythm and dance activities. The study included group consisted of 34 students classified as overweight based on calculated BMI. From total number, 20 were females and 14 males with BMI > 25. They participated in a rhythm and dance classes. The classes were held twice a week for 60 minutes. Different statistic methods including, mathematical-statistical method, i.e. variation analysis was applied. The outcomes of the study show that students deeply realize the need for PE and sports classes at universities and have a positive attitude to classes of “Rhythmic and dances”. Except for the functional influence on the organism, folk dances save and preserve the existing folk customs and traditions in students’ minds, form qualities like patriotism, memory and unity.

Keywords: folk dances, body weight

INTRODUCTION

During last few years, many studies warn about the increasing number of overweight people in different countries. Obesity is among the proven risk factors for cardiovascular diseases and premature death. These people are at great risk of developing diabetes type 2, hypertonia, dyslipidemia, coronary artery disease, stroke, sleep apnea, osteoarthritis, depressions and malignancies. Obesity is also a serious aesthetic problem that deforms an individual’s body and impairs his or her mental health. Its social significance is determined by the high rate of mortality and increasing disability among the working-age population.

Although this problem exists all over the world it is more common for regions with a higher lifestyle. In the last 20 years in Europe, the percentage of overweight people has increased from 10% to 40%. Healthy lifestyles are associated with rational and conscious nutrition habits and physical activity, taking into account the health and age of the participants. One of the main reasons for the growing number of diseases is the lack of movement in people’s everyday lives (Yancheva & Agapio, 2001).

Considering the worrying situation, some authors have pointed out dances as one of those means that have a complex effect on the psychophysical balance of the human body. Practicing folk dances enriches the motion culture and broadens the musical views (Bazekov & Ignatova, 2011; Dyu Bek, 2009; Dyakova, 2012; Uliks, 2003). Dances have a complex influence over the psychophysical balance of the human organism. The function of cardiovascular and breathing systems improves. In connection with the latter problems, we aimed at studying the impact of dance activities on the maximum oxygen consumption of overweight and obese students. When the rhythm is fast even for a while the pulse and breathing grow faster. Energy consumption increases and the intensity of oxidation processes does not allow accumulation of redundant body mass. The increased functions of the cardiovascular and breathing systems during longer training have a positive effect on the working capacity and stamina of the organism.

The musculoskeletal system is influenced by the dance moves which vary in character, strength, amplitude and duration. The bone system becomes stronger, muscle mass increases. This in turn also improves motor coordination. The functioning of the cardiovascular and respiratory systems improves. When the rhythm is fast even for a while the pulse and breathing grow faster. Energy consumption increases and the intensity of oxidation processes does not allow accumulation of redundant body mass. The increased functions of the cardiovascular and breathing systems during longer training have a positive effect on the working capacity and stamina of the organism.

Folk dances contribute to improving motor performance. Fast and dynamic movements (hops, jumps, running, etc.) develop the quality of speed. In parallel, general and special endurance also enhance. Special dance exercises and combinations develop strength and flexibility. The high emotional background of the activity stimulates the release of more adrenaline, which is a strong stimulant for the activity of the heart and muscles.

Endurance is one of the leading characteristics of human activity because it determines an individual’s ability to maintain his or her ability to work for an extended period.

One of the most important criteria for endurance is maximal oxygen consumption (VO₂ max), which determines the ability of the body to supply oxygen to the working muscles from the external environment (air) (Yancheva & Gencheva, 2015). Maximum oxygen consumption (VO₂ max) is the best indicator of the cardiovascular and aerobic capacity of a person, i.e. the more oxygen it can absorb during exercise, the more energy it can produce. As the effort increases, oxygen consumption increases, and there comes a moment when the effort reaches a certain maximum point, but oxygen consumption does not increase, which is VO₂ max. Therefore, the higher the maximum oxygen consumption, the better the physical form. Maximum oxygen consumption (VO₂ max) is a value that theoretically indicates the maximum amount of oxygen that the body can use per time unit. This means that the higher the oxygen capacity, the greater the job opportunities without feeling tired for a long time.

Table 1. HR and VO2 max values before and after the experiment

Factors	X min	Xmax	Av	Sav	V%	% of increase
HR	126	167	141	11.47	131.58	3.5
	112	161	136	11.56	133.55	
VO2 max	1,13	3,36	2,64	0,66	0,44	12,9
	1,83	3,77	2,98	0,61	0,37	

Athletes normally have more oxygen capacity than untrained people, which is why their cardiovascular system functions significantly less through physical exertion. Values of maximum oxygen consumption (VO2 max) underlie many training programs for athletes and are also indicative of determining the physical performance of both healthy people and those with chronic illnesses.

METHODS

The aim of the current study was to determine the impact of dance activities on the maximum oxygen consumption of overweight and obese students. Following objectives were define for the study: review of literature related to the research problem; to track the changes in the maximum oxygen consumption of the respondents as a result of practicing folk dances.

The subject of the study is the techniques of influence when trying to affect the endurance of the respondents. The focus of the study is the indicators characterizing the heart rate and the maximum oxygen consumption (VO2 max) of the students as a result of the rhythm and dance activities.

The studied group was consisted of 34 students, from which, 20 women and 14 men with BMI > 25, who participated in a rhythm and dance classes. The classes were held twice a week for 60 minutes.

To solve the tasks and to achieve the purpose of the study we used a methodology that includes the following components: theoretical analysis and synthesis, mathematical-statistical method, i.e. variation analysis.

To reduce body weight and increase student endurance, we have implemented a rhythmic and dance model that involves the following folk dances:

- 2/4 (Pravo horo, Graovsko horo, Shopsko, Trite pati, Raka, Shira);
- 7/8 (Pravo Pirinsko, Makedonsko horo, Shirto);
- 9/8 (Samokovsko horo, Dzhanguritsa);
- 9/16 (Daychovo horo);
- 13/16 (Elenino horo).

Interval method of exercising was applied meaning that after warming up we alternated a folk dance of fast rhythm (160-180 MB) - 1 min, with the folk dance with slow rhythm (60-90 MB) - 1 min. for 40 min. The exertion varied within 130-160 beats/ min. The maximum oxygen consumption was calculated by the formula: $VO_2\max = 6.9652 + (0.0091 * \text{weight (lb)}) - (0.0257 * \text{years}) + (0.5955 * \text{gender}) - (0.2240 * 1 \text{ miles (min)}) - (0.0115 * \text{pulse rate (min)})$.

RESULTS AND DISCUSSION

The results of the study are presented in Table 1. The numerator indicates the values before and the denominator the values at the end of the experiment. By analyzing the values and variability of the studied indicators we sought to clarify the degree of influence of the implemented program.

For one of the main indicators of the functioning of the cardiovascular system - heart rate, the mean values at the end of the experi-

ment decrease. The standard deviation is low and almost unchanged at the end of the experiment, which leads us to the conclusion that dance activities have an impact on the heart rate.

After six months of dancing, the maximum oxygen consumption increases. This is evident from the growth rate of (12.9%). The coefficient of variation is low with a tendency to decrease. In this way, good training and health effect is achieved and the students are conscious about it.

From the analysis of empirical data that determine the functional state of the dancers, some generalizations can be made that relate to the following:

- From the analysis of HR and VO2 max indicators it became clear that folk and dance activities influenced positively the overall training and working capacity of overweight students.
- The increased maximum oxygen consumption is a good indicator of their physical state.
- In addition to the functional effects on the body, being engaged in folk and dance activities form qualities such as tribal memory, patriotism and unity.

CONCLUSIONS

The outcomes of the study show that students deeply realize the need for PE and sports classes at universities and have a positive attitude to classes of "Rhythmic and dances". This refers to particular group, overweight students that attended dance classes on regular bases. It was determining that participating at dance classes, two times during the week, with duration of min 60 minutes, changes can be noted in HR and VO2 max. Namely, these two were positively associated with dance classes, indicating that folk and dance activities influenced positively on overall working capacity of overweight students. Engagement in folk and dance classes was determined to be a good indicator for improved physical wellbeing. It also has positive effects on functioning of the body, motor abilities and functional body condition, Being engaged in folk and dance also was determined to have positive effects on patriotism and unity.

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