

CHANGES OF ENDURANCE AND FLEXIBILITY IN JAZZ-BALLET DANCERS USING MIXED MODELS OF AEROBICS

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ABSTRACT

As endurance and flexibility are motor abilities crucial for correct and forehand performance of moves, and having as an aim to get as much information about motor abilities crucial for top performance in jazz – ballet, authors decided to apply the model of aerobic to the training process for jazz – ballet dancers. The aim of the research was to define the effects of applied model, on development of endurance and flexibility, to confirm its positive influence on these abilities with jazz – ballet dancers. The research was carried with 20 female respondents, jazz- ballet dancers at the age of 12-15, who were members of the national team of Bosnia and Herzegovina in modern dances. The set of five tests for evaluating flexibility and two tests for evaluating endurance were conducted with the dancers. By analysing results obtained T- test, it has been established that there were statistically significant positive changes and statistically significant difference in variables for assessment of motor abilities positive which show the positive effects of the applied model of training. On this basis, it can be concluded that the model of aerobic applied in jazz – ballet led to improvement of dancers' endurance and flexibility.

Keywords: endurance, flexibility, aerobic, jazz-ballet

INTRODUCTION

Appropriate adjustment of athletes through sports training process will be achieved if genetically predetermined morphological, motor and functional abilities of the athlete by a corresponding training curriculum. The size of the energy capacity (aerobic and anaerobic) differs both between dancers of different disciplines and between the dancers of the same discipline. Since the duration of the dance performance in the discipline of jazz dance and 3-4 minutes in the development of functional skills, you should pay more attention to the development of aerobic capacity. Glycogen stores in muscles and liver are sufficient for up to 90 minutes of intense aerobic activity, meaning that stocks are generally sufficient to cover the needs of the average dance training. Adaptation to physical load increases the functional activity of the mitochondrial system, which provides the aerobic capacity of the body and accelerates the oxidation of pyruvate and fatty acids (Guyton, 2003). It features recreational facilities aerobic program orientation such that the dynamic mode engaged 1/6-1/7 total muscle musculature, the program duration of 20 to 60 minutes of continuous aerobic work, the application program 3-5 times a week. Interval training intensity of 90-95% of maximum heart rate for 3 - 8 minutes mostly hires an oxygen transport system (Hoff and Helgerud 2004, AM Jones 1999). If such training was carried out 8 to 10 weeks, improvements in the maximum possible receiving oxygen are 10 to 30% higher, depending on the state of their fitness and individual capabilities of the transportation of oxygen (Helgerud et al., 2001). Ideal resistance training in dance should be performed under conditions that are most similar to those prevailing in the competition. Then the durability further develops technical - tactical capabilities that find their application during the show. However, the labor intensity is reduced when the training involves a number of technical - tactical requirements Bangsbo et al. (1996), Hoff et al. (2002) demonstrated that a simulated situational training requirements meet the same requirements in terms of intensity and training to improve endurance 90-95% of maximum heart rate for 3 to 5 minutes. Specificity of training dancers Jazz-ballet consisting of a repetition of some choreographic elements, which are often made and various jumps, so it's very strain the feet and lower limbs. The artistic body dance movements displayed in place specific demands on the body in terms of endurance and aerobic capacity, muscle strength, overall flexibility, joint stability, somato-sensory integration, and neuromuscular coordination. Therefore, it is easy to envision how a dancer is as much an athlete as an artist. As dancers undertake these parallel roles, dance medicine has been enriched by applying concepts from sports medicine within the specific technical context of the diverse dance styles, such as jazz, modern, ballet and Keryl Motta-Valencia (2006). Therefore, when performing choreography in jazz ballet judges evaluate the technical, artistic side as well as deductions. Based on that form and realized range of movement of the individual elements judges makes the final score. Looking at these settings, the authors have chosen to make the training process Jazz-ballet dancers apply a model of combined aerobic as well as situational resources for the development of functional ability and flexibility. Model is a combination of Zumba, Tae Bo and Pilates programs that are tailored to the specifics of work with this group of patients.

METHODS

The aim of this study was to determine the effects of combined aerobic model, the development of the development of endurance and flexibility in Jazz-ballet dancers. The study was conducted over 12 weeks, the park Mladen Stojanovic and sports hall of the Faculty of Physical Education and Sport in Banja Luka, in the pre-season training process Jazz-ballet dancers. Prior to the implementation of combined model of aerobics, initial testing was conducted using two variables for durability and five variables for flexibility, and body height, weight and BMI. To determine the level of motor skills listed at the end of the training process, the final test was conducted. The analysis of the results showed the efficiency of the applied model of training. Testing protocol was followed. The sample consisted of 20 patients, Jazz-ballet dancers aged 12-15 years, who are actively competing in jazz and ballet are team of Bosnia and Herzegovina in modern dance. Prior to testing, subjects underwent systematic medical examination where it was established that all the respondents healthy and fit for all loads anticipated training process. In the course of his career is not registered with injuries of the locomotor apparatus in some patients. The research results of the efficiency of application of combined aerobic model, the development of resilience in Jazz-ballet dancers of the tests used to assess the durability dancer Harvard test and 300 yards, and a set of five tests to assess the flexibility of a dancer: legs in front of body, legs behind the body and legs beside the body, reach on bench and on the floor (Metikoš, D. et al., 1989). In the statistical analysis for each test and each dancer individually taken the arithmetic means derived from the specified number of attempts. He was taken to the training process for a period of three months, planned for weeks while the volume and intensity of training adapted to the individual needs. During the six weeks of training is maintained and each training lasted for 60 minutes. By two weeks, the same schedule was repeated models of aerobic work within the program with minor adjustments of volume and intensity. The very structure of certain classes is divided into three parts: introduction, main and final (Zagorc, Zaletel and Ižanc, 1998). In the introductory part of the hour that lasts for 10 min also prepares the entire body for the upcoming load with musical background that was moving in the range of 115-125 beats per minute. They are different exercises that are contained running, walking, jumps and movements of the arms and legs in different directions and directions. Zumba program is structured to work with rhythm changes that were in the range of 115-155 beats per minute. The main part of the hour is applied to basic Zumba choreography that is based on the movements of different Latin dances: Twist, merengue, salsa, bachata, Cha cha che and others with a combination of movements involving large muscle groups, and that the entire body. The main part of the lesson is 40 minutes with breaks that were part of the choreography. After that, in the final part which will last 10 minutes were applied exercises for relaxation. Data were processed with the statistical package SPSS 16.0 for Windows. The results obtained in tests of endurance and flexibility was analyzed by descriptive statistics, and the effects of the applied training model were determined by t-test for paired samples.

RESULTS

In Tables 1 and 2 are given the results obtained by descriptive statistics and the results achieved in the endurance test, measurements obtained in the initial and final state, and the results obtained by t-test for paired samples.

Table 1 Descriptive statistics of the results of tests of endurance

	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
300 ini	32	37	34.62	1.431	-.152	.501	-.486	.972
300 fin	28	37	32.14	2.007	.522	.501	1.300	.972
harvard ini	51	111	71.57	13.493	1.667	.501	3.466	.972
harvard fin	57	127	78.14	14.637	1.837	.501	5.687	.972
harvindex ini	1	5	3.19	.981	-.770	.501	1.002	.972
harvindex fin	1	4	2.86	.854	-.773	.501	.593	.972

Table 2 T-test for dependent samples test of endurance

VARIABLES		Mean	Std. Deviation	Std. Deviation Mean Lower	95% Trust Interval		t	df	Sign. (2-ways)
					Upper				
1	300y ini-fin	2.476	1.365	.298	1.855	3.097	8.316	20	.000
2	Harvard ini-fin	-6.571	12.400	2.706	-12.216	-.927	-2.429	20	.025
3	Harvindex ini- fin	.667	.913	.199	.251	1.082	3.347	20	.003

Table 3 are given the results obtained by descriptive statistics, the results achieved by the dancers achieved in the tests of flexibility, obtained by measuring the initial and final state, and the results obtained by t-test for paired samples.

Table 3 T-test of dependent samples

VARIABLES		Mean (in - fin)	Mean	Std. Deviation	Std. Deviat. Mean Lower	95% Trust Interval		t	df	Sign. (2-ways)
						Upper				
1	LIFOB R ini-fin	116.55±12.27 120.40±12.43	-3.850	4.356	.974	-5.889	-1.811	-3.952	19	.001
2	LIFOB L ini-fin	111.00±9.91 112.10±10.65	-1.100	5.025	1.124	-3.452	1.252	-.979	19	.340
3	LBTB R ini- fin	29.50±4.26 33.15±3.74	-3.650	3.100	.693	-5.101	-2.199	-5.266	19	.000
4	LBTB L ini-fin	27.80±4.64 30.00±4.73	-2.200	4.641	1.038	-4.372	-.028	-2.120	19	.047
5	LBTB R ini- fin	58.60±10.35 61.00±10.87	-2.400	2.479	.554	-3.560	-1.240	-4.329	19	.000
6	LBTB L ini- fin	60.10±16.01 63.60±14.44	-3.500	7.681	1.718	-7.095	.095	-2.038	19	.056
7	forward bend bench ini- fin	40.95±4.70 40.50±5.49	.450	2.012	.450	-.492	1.392	1.000	19	.330
8	forward bend ground ini - fin	82.30±9.37 87.15±8.95	-4.850	3.588	.802	-6.529	-3.171	-6.046	19	.000
9	BMI ini- fin	20.65±5.04 20.10±4.84	.550	.999	.223	.083	1.017	2.463	19	.024

DISCUSSION

Looking at the results shown in Table 1 it can be concluded that this is a normal distribution and the results were statistically significant differences in the variables ($p \leq 0.05$). The results in Table 2 partially confirm those obtained in studies Aerobic fitness and that included five countries for young people aged 9-17 years (1962 in 1994); aerobic performance and results-youth from 9-17years from 28 countries over the (from 1964 to 2008. whatever). Changes in aerobic performance, but not aerobic fitness, were constant for sexes, age and geographical area, in the direction of achieving a weaker performance, although not clearly defined what has made such an impact on the results (Albon HM 2010, Andersen LB 2010). The biggest difference is measured at half of respondents (N Armstrong & Welsman 1994) which shows a faster increase in VO₂ with male of 8-16 years, while for females, the results obtained in the development of the age of 8-13 years when there is a certain threshold (Armstrong N. & McManus 2008). On average, young people in this area of research showed 15-20% improvement in VO₂max applying different models of training although there are certain differences in terms of features that have high innate predispositions. Results of cross-country studies that included admission of oxygen through the various sports (cycling; swimming and canoeing) has showed that coached youth have better results in taking VO₂ than their untrained counterparts (Rowland TW & Unnithan VB 1994 van Huss 1988). In doing so, the male respondents tended higher VO₂ values than respondents, but the resulting difference should be carefully interpreted through the prism of additional influencing factors in individual studies. Most of the research was based on a program for a period of 12 weeks that contributed to the development of VO₂ by 8-9%, regardless of sex, maturity and age. Higher values are, of course, can get in the programs that have lasted longer. Comparing the results obtained at the initial and final measurement (Table 3) shows that in the majority of treated variables showed a statistically significant difference. It can be concluded that in the test the foot in front of the body a statistically significant difference only when treated right leg, for which better data are obtained in both measurements compared to the left (which is the most dominant leg jumps and pirouettes that respondents working in technical training). These points show us the need to change further attention on the development the same level of flexibility on both sides of the lower extremities. Results of the foot behind the body test show significant difference in performance of the test in both lower extremities. Data obtained in the foot alongside of the body test

revealed statistically significant differences in the case of application number on the left leg, while the results obtained with the same test right leg did not show a statistically significant difference. Test forward bend on the bench did not contribute to the differentiation of the results of students in the two measurements, the flexibility of this segment, while the test reach on the ground differentiated results of the initial and final measurements indicating a statistically significant difference. One can observe a statistically significant difference in the results of BMI body composition of students in the initial and final measurement. Realized positive levels of significance are the variables were significantly lower than the theoretical limit ($p \leq 0.05$). As noted, the authors have chosen to make in order to improve flexibility, in training ballet dancer Jazz apply combined aerobic model, and came to the conclusion that it is applied in 4 of 5 tests for the assessment of these motor skills were significant improvements in results the final measurement compared to the results of the initial measurement.

CONCLUSION

Most authors who have studied the area of development of these components of functional ability is centered around two positions (Armstrong 1994, Baxter-Jones A, 1993) that young people already possess the threshold of development and thus the impact of the difficult training process; puberty and that is specially suited sensitive period in which they can influence the development of aerobic capabilities. Although there is some disagreement about whether the training can influence the development before puberty receipt of VO₂, (Bar-Or 1983, Rowland 1994, Vinet A. 2003), most research suggests that such effects exist (Rowland & J. Welsman, 1995). The results of this study indicate that there is a possibility of developing functional skills using the above aerobic, jazz ballet dancer in which the adolescent period of life. Certain elements themselves symbiosis program (Zumba and Pilates-especially as certain elements of Tae-Bo) and their performance to a higher level, indicating the positive directions of functional capacity and severity of the patients approach the matter. Since the four of five tests conducted for the flexibility shown significant positive changes between the initial and final state of a dancer, it can be said that there was a positive step forward in the development of their flexibility. Based on this, we can conclude that training process Jazz Ballet, where for three months preparation time spent content aerobic training led to greater flexibility of the dancer. Given the complexity of the use of dance as a discipline this or similar models (Jovanovic S. 2010, Viskić Štalec N-2007), in particular improving motor and functional ability is what we should strive to optimize the efficiency of the training process and dancer. Although the results of this study showed positive trends should be interpreted carefully, with special attention to the influence of other cardiovascular mechanisms (van Huss), BMI index, (Albon, TS Olds, Olds TS 2004., 2009, T. Olds, 2007), and the motivation of the program and the testing itself (, Sjödin B, Olds TS, 2004, Zhang, Y.).

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