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EFFECTS OF PROGRAM OF SPORT GYMNASTICS TO MOTORIC ABILITIES OF STUDENTS AT FACULTY OF PHYSICAL EDUCATION AND SPORT IN EAST SARAJEVO***Summary***

Aim of this research is establishing effects of program of sport gymnastics to motoric abilities (of students at Faculty of Physical Education in East Sarajevo). On the basis of quantitative differences between initial and final state at multi-variant level it was established that the students who realized the program of sport gymnastics had statistically significant improvements in motoric skills at the level of $Q=.000$. Quantitative differences at univariant level in some tests of motoric abilities show significant difference between initial and final state in all variables at the level of $.00$ ($Q<.00$). From the obtained results we may draw a conclusion that the program of sport gymnastics yielded significant results in changes in all the measured motoric abilities.

Key words: *effect, sport gymnastics, students, motoric abilities.*

1. INTRODUCTION

By definition, gymnastics are a form of rational, strictly defined, controlled and aesthetically shaped motoric ability whose final aim is: uniform body development, perfecting the control and guidance of movement, development of coordination, muscle strength and agility. In exercises with apparatus and floor exercises it is being insisted on correct and adequate posture and finely shaped movement which is in the domain of aesthetic education as part of teaching tasks in pedagogical practice (Kyselovlcová & Tibenská, 2007; Broomfied, 2011).

Gymnastic sports fulfill all the above mentioned criteria. There is almost no sport or any other motoric activity which is more versatile in movement and positions as gymnastics. It is based on understanding the fact that in the vastness of positions and movement as well as the wide choice of newly designed equipment used as apparatus there is always a possibility to recommend adequate exercise regardless of their age, gender, body shape or level of motoric development (Madić, 2000; Madić, Popović, & Tumin, 2009.).

In today's modern world, gymnastics and especially acrobatics exist in education, sport competitions, other branches in sport, other areas of sport activities and physical activities, kinesiotherapy programs and recreational exercising (Živčić & Krističević, 2008). As one of the most important roles of gymnastics is development of motoric abilities, first of all coordination, strength, flexibility and balance, it should definitely be put in practice and understood as constitutional, everyday manner of exercising (Badić, Živčić Marković, Sporiš, Milanović & Trajković, 2012; Bučar-Pajek, Čuk, Kovač & Jakše, 2010).

Krsmanović (Krsmanović, 1985, 1996), Babin, Zrnzević (Zrnzević, 2003, 2007) and others established in their research that efficiency of realization of program content is not at satisfactory level and that positive effects can be achieved with versatile content from natural

forms of movement: athletics, sport gymnastics and sport games and the application of additional exercises.

Therefore, aim of this research was to establish effects of program of sport gymnastics to motoric abilities (explosive strength, coordination and flexibility) in students of Faculty of Physical Education and Sport in East Sarajevo.

2. RESEARCH METHODS

Sample

Research was conducted on the sample of 20 regular students, all male, aged 20-22 \pm 6 months who attended and successfully realized classes in program for sport gymnastics at the second year at Faculty of Physical Education and Sport at University in East Sarajevo.

2.2. Sample of Variables

Sample of motoric tests

A) Tests for assessment of Explosive Strength

1. Squat jump (MSKDA)
2. Lying medicine ball throw (MBMUD)
3. Standing triple jump (MTRIM)

B) Tests for assessment of Coordination

4. Air agility (MOKVZ)
5. Floor agility (MOKTL)
6. Stick coordination (MKPAL)

C) Tests for assessment of Flexibility

7. Forward bend on the bench (MDPRK)
8. Front hip (MČŠPA)
9. flexibility in the shoulders (MISKP)

Description of program realization and measuring

Program consisted of realization of gymnastic elements from sport gymnastics realized from October 1st 2016 when the school year started at the Faculty of Physical Education and Sport at University of East Sarajevo and it lasted continuously until January 13th 2017, one full semester or 30 classes. This period was assessed as the most convenient to perform research about changes in the desired values in qualitative sense, considering the fact that there was summer break and the initial state of the participants. At the start initial measuring for the tests used in the research was performed and in the end final measuring was performed as well with the aim to establish variability of the results obtained for the motoric abilities of the students. In the course of realization and for the purpose of adaptation of the organism to motoric abilities and their improvement values were occasionally checked as well as the dynamics of heart rate. Using the registered changes while the realization was in progress further progressive increase in the intensity of the activities was further influenced.

3. RESULTS AND DISCUSSION

Table 1. Quantitative differences at multi-variant level between students' initial and final measuring

Wilks' Lambda	F	df ₁	df ₂	Q
.657	5.92	9	56	.000

Legend: Wilks lambda – value of the coefficient of the Wilks' test for equality of centrioles for the groups; F – coefficient value of the F test for testing the significance of Wilks' Lambda; df₁, df₂ – degrees of freedom; Q – coefficient of significance for differences in arithmetic means

Analysis results of the quantitative differences between initial and final state at multi-variant level (Table 1) validate that the students who realized program of sport gymnastics had significant improvement of motoric abilities at statistical level of $Q=.000$.

Table 2. Quantitative differences at univariant level between students' initial and final measuring

Variables	Mean (I)	Mean (F)	F-relation	Q
MSKDA	227.36	235.68	4.86	.000
MBMUD	10.85	12.96	5.78	.000
MTRIM	568.50	693.55	5.75	.000
MOKVZ	15.24	12.13	6.67	.000
MOKTL	26.52	23.27	3.56	.000
MKPAL	17.32	14.50	6.31	.000
MDPRK	29.45	36.56	4.47	.000
MŠPAG	128.93	137.26	5.68	.000
MISKP	88.52	77.58	9.88	.000

Legend: Mean – arithmetic means; F – value of F coefficient for testing the significance of differences; Q – Coefficient of significance of differences in arithmetic means;

In Table 2 are presented qualitative differences at univariant level in certain tests of motoric abilities between initial and final state and significant difference was evident in all the variables at the level of .00 ($Q<.00$).

It can be concluded from the obtained results that the program of sport gymnastics yielded extraordinary results in changes in all the measured motoric abilities. We have to keep in mind that students practice other sport activities on daily basis (trainings, recreational exercising and practical classes in other subjects in the curriculum of the Faculty) which significantly improve their motoric abilities. However, that is insufficient without well practiced technique of the elements of sport gymnastics because motoric memory (motoric information, motoric habits) is a set of well - trained elements of technique of various moves and movement, connections and composition at gymnastic apparatus. Such level of training is being led to the level of automatization of gymnastic operations, such automatization that eventual disruption of a connected element can lead to easy re-organization of the acquired stereotype or one can immediately react with some other connection, move or position (Petrović, Buđa, Radojević, Sedić, Petković & Grbović, 1995; Veličković, Petković, & Ilić, 2010; Fulurija, & Jovanović, 2013).

We consider that after the obtained results presented in Table 1 and table 2 it can be concluded that the motoric abilities were significantly improved after program of sport gymnastics.

4. CONCLUSION

According to the performed analysis of the research results, where we concluded that the program of sport gymnastics significantly increased the level of motoric abilities of students, it was also perceived as a manner of pursuing quality in continuous professional work in the educational process in teaching sport gymnastics, as well as a contribution to gymnastics and gymnastic community in general.

Majority of motoric abilities and habits is acquired and developed exclusively in childhood. They can be highly influenced in pre-school and early school age. Structure of motoric area on the basis of endogenous and exogenous factors is being developed in that period (Bala, Kiš & Popović 1996). Generally speaking, we may say that motoric abilities are

steadily improving during pre-school and early school period, but not always in a linear manner which positively manifests itself afterwards (Popović, Cvetković & Grujičić, 2006.; Kalajdžić, Obradović & Cvetković, 2007).

Ability of sport gymnastics to answer the aims of pedagogical work is practically without limitations. All the changes in abilities acquired using the gymnastic program are a healthy foundation, a concrete experience with great possibilities for realization in life activities as well as other sports (Fulurija, Perović, Gojković, Bjelica & Majstorović, 2016).

Specific trait of sport gymnastics is that absence of exercise can not be bridged by inspiration, stimulants or better tactics because sport gymnastics are dominated by bio-mechanical complexity of performing motoric structures where only the quality of performance is being scored and high scores are achieved only through previous preparation, i.e. quality and quantity of work done. Anything that was previously not exercised, trained or learnt can not be covered by other means. (Tibenská, Kyselovičová & Medeková, 2010).

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