COMPARISON OF MOTOR ABILITIES WITH FEMALE STUDENTS, DEALING WITH ATHLETES AND NON ATHLETES

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Abstract

The research was conducted on a sample of 170 female students at the age of 14-16 years, from the elementary school. According to the research criteria, answering the question of the requirement for engaging in sports, the sample was divided on two subsamples, and with this research 170 girls were tested, from which 70 were defined as female students who regularly attend classes of physical education and are dealing with volleyball and 100 were defined as female students who regularly attend classes of physical education but are not dealing with any sport. The main goal of this research is partially establishing the quantitative and structural differences in basic-motor abilities of female students at the age of 14-16 years dealing with sports (volleyball) and non athletes. For the determination of the partial quantitate differences on uni variant level between the two subsamples t-test for small independent samples was applied. Based on the results of Wilk's Lambda, and in association with Rao's approximation, are giving a significant difference Q = .00 (p- level = 0.00) of the analyzed space. From the analysis of the results it can be concluded that there are differences between groups in the examined space. By applying the uni variant analysis of variance (ANOVA), can be seen statistically significant difference between respondents in the two groups of respondents in the variables: From the results of the t-test, it can be concluded that the analyzed group of respondents statistically significant differs in the variables.

Key words: *volleyball, female students, differences, non athletes*

INTRODUCTION

Not knowing the movement that needs to be performed within the motor program results with irrationality in the exercises. Such irrationality necessarily is defined by physiological responses to high load. According to Metikoš et. al (2003), all motor movements can be regarded as motor information that are successfully perform better when "algorithms commands" or motor programs are being better established. According to Coh & et. al (2004), the movement can be performed when there is adequate motor program.

The moving process begins by defining the desired result and consists of three interrelated phases: basic movement coordination, precise coordination movement and stabilization phase of the movement in variables and difficult circumstances. Prerequisite for effective motor learning is precisely performed movement, which is based on the visual, and thus the kinesthetic processing information. The motor program is established in the central nervous system and contains prepared muscle commands with all the details required for execution of that movement (Horga, 1993). Such programs allow direct connection of the exact movements with a certain signal, without the intermediate stages. In the initial phase of implementation of the motor program the cognitive function strongly includes (Adams, 1971; Gentile, 1972; Mikić, 1999.) and motor factors of higher order (Metikoš et. al, 2003.), and especially the general factor of coordination.

During the development of the structure of motor programs the influence of the mentioned factors gradually decreases, and the dimensions of the bottom row of different segments in the anthropological space in a greater extent directly affect the success of the acquired motor skills. Programmed content that are used in sports such as volleyball, strongly influence on the development of the anthropological features and quality of the technical and tactical knowledge of volleyball, and often are decisive factor in achieving the final result in this sport. It can be assumed that these significant impacts can be seen with primary school female students who are not involved in sports, which will have a theoretical and practical values of physical education, because you can get scientific information's about the anthropological dimensions of the space, that has greatest impact on the outcome and the effectiveness of programs of teaching physical education for elementary school in volleyball.

METHODS

With the design of this type of research we had intended to establish the possible differences in the space of basic-motor abilities with female primary school students, from VII to IX grade, at the age of ± 14 to ± 16 - volleyball athletes and female students at the same age who are not involved in sport. For the realization of this project, the research was conducted on a sample of 170 female students at the age of 14-16 years, from the elementary school "Tefik Čanga" and elementary school"Ibn Sereči" from Ferizaj, or girls from VII to IX grade of these schools, as well as members of OK "Kastrioti" from the school of Ferizaj and schools OK "Drita" from Gjilan. According to the research criteria, answering the question of the requirement for engaging in sports, the sample was divided on two subsamples, and with this research 170 girls were tested, from which 70 were defined as female students who regularly attend classes of physical education and are dealing with volleyball and 100 were defined as female students who regularly attend classes of physical education but are not dealing with any sport.

In this research the following measuring instruments will be applied for assessment of the basic-motor abilities (16 variables). *Variables for assessment the mechanism for synergic regulation and regulation of the tonus:* Tap with hand (MBFTAP), Tap with foot (MBFTAN), Bend – roll up – touch (MBFPZD), Bend on a bench (MBFPRK), Flamingo balance test (MFLFLA), Turn in the air with stick (MFLISK). *Variables for assessment the mechanism that regulates the intensity of the excitation:* Long jump from place (MFESDM), Jump height of place (MFESLM), Throwing the ball out of place (MFEBML), Running 20 m (MFE20B). *Variables for assessment the mechanism for structuring the movement:* Envelope test (running in rectangle) (MAGTUP), Side steps (MAGKUS), Hand slalom with three balls (MKTRSL). *Variables for assessment of the mechanism that regulates the duration of the excitation:* Raising the trunk in 30 seconds (MRCDTS), Pushups from the knees (MSASKL), Lock the trunk from lying (MRCZTL).

The data in this study were processed using the software system for multivariate and uni variant analysis of the data. Analyses were treated in programs: Excel for Windows, Statistic 12.0 for Windows and the program IBM SPSS 20.0 for Windows. The variables that were used in this study were processed using standard descriptive methods, the basic central and dispersion parameters were calculated in order to determine their distribution functions and the basic parameters of the function for all areas investigated, and the difference between the received and expected relative cumulative frequencies. In this way it was possible to test the hypothesis that the distribution of results is normal as was tested with the Kolmogorov-Smirnof method. For the obtained results have been calculated the following parameters: the arithmetic mean (Mean), standard deviation (St.dev), minimum value (min), maximum value (max). The hypothesis that some variables are normally distributed will be tested on the basis of these measures: Coefficient of curvature - Skewness and coefficient of elongation - Kurtosis. For the determination of the partial quantitative differences on uni variant level between the two subsamples t-test for small independent samples was applied. In order to be established the differences between the tested groups, the method for variance analysis and multi variant analysis of the variance (MANOVA and ANOVA) were applied.

RESULTS AND DISCUSSION

Table 1 refers to the two groups of respondents analyzed using multi variant analysis of variance (MANOVA). Based on the results of Wilk's Lambda which is ,27 and in association with Rao's R = 25,56 approximation and degrees of freedom df1 = 16 and df2 = 153, are giving a significant difference Q = .00 (p- level = 0.00) of the analyzed space. From the analysis of the results it can be concluded that there are differences between groups in the examined space.

A statistically significant difference could be detected between the two groups of respondents using uni variant analysis (ANOVA) in the both groups of fourteen variables: Tap with hand (MBFTAP p <0,00), Tap with foot (MBFTAN p <0,00), Bend – roll up – touch (MBFPZD p <0,00), Flamingo balance test (MFLFLA p <0,00), Long jump from place (MFESDM p <0,00), Jump height of place (MFESLM p <0,00), Throwing the ball out of place (MFEBML p <0,00), Running 20 meters (MFE20V p <0,00), Envelope test (running in rectangle) (MAGTUP p <0,00), Side steps (MAGKUS p <0,00), Hand slalom with three balls (MKTSRL p <0.00), Raising the trunk in 30 seconds (MRCDTS p <0,00), Push-ups from the knee (MSASKL p <0,00) and Lock the trunk from lying (MRCZTL p <0,00).

In Table 2 can be seen the differences in the arithmetic means among the both groups of respondents (volleyball athletes and non

athletes), using a t-test for independent samples. From the results of the t-test, it can be concluded that the analyzed group of respondents statistically significant differs in the variables: Tap with hand (MBFTAP p <0,00), Tap with foot (MBFTAN p <0,00), Bend – roll up – touch (MBFPZD p <0,00), Flamingo balance test (MFLFLA p <0,00), Long jump from place (MFESDM p <0,00), Jump height of place (MFESLM p <0,00), Throwing the ball out of place (MFEBML p <0.00), Running 20 meters (MFE20V p <0,00), Envelope test (running in rectangle) (MAGTUP p <0,00), Side steps (MAGKUS p <0,00), Hand slalom with three balls (MKTSRL p <0,00) , Raising the trunk in 30 seconds (MRCDTS p <0,00), Push-ups from knees (MSASKL p <0,00) and Lock the trunk from lying (MRCZTL p <0,00).

Table 1. ANOVA-uni variant analysis of variance and MANOVA- multi variant analysis of variance between the two groups of respondents in the motor features.

Wilks' Lambda	Rao's R	df 1	df 2	p-level
,27	25,56	16	153	0,00

Variables	Mean sqr Effect	Mean sqr Error	F(df1,2) 1,168	p-level
MBFTAP	7725,35	62,47	123,66	,00
MBFTAN	54,73	8,10	6,08	,01
MBFPZD	42,48	4,15	10,22	,00
MBFPRK	93,27	39,29	2,37	,12
MFLFLA	142,45	8,02	17,75	,00
MFLISK	446,86	172,47	2,59	,11
MFESDM	11107,65	327,11	33,96	,00
MFESLM	462,50	87,13	5,31	,02
MFEBML	21,42	1,17	18,33	,00
MFE20V	8,37	,12	70,53	,00
MAGTUP	112,48	2,81	39,96	,00
MAGKUS	222,76	2,82	79,05	,00
MKTSRL	222,71	3,99	55,74	,00
MRCDTS	741,25	11,91	62,22	,00
MSASKL	255,59	47,43	5,39	,02
MRCZTL	5232,60	62,33	83,95	,00

Comparing the results from both analyzes it can be concluded that according to the two analyzes that were conducted (ANOVA and t-test), identical results were obtained, i.e. the differences between volleyball athletes and non athletes in twelve of the fourteen applied variables were established.

Table 2. T-test, Differences in the arithmetic means between the two groups of respondents (volleyball athletes and non athletes)

Group 1: G_1:1 Group 2: G_2:2											
Mean G_1:1	Mean G_2:2	t-value	df	p	Valid N G_1:1	Valid N G_2:2	Std.Dev. G_1:1	Std.Dev. G_2:2	F-ratio variances	p variances
MBFTAP	22,083	35,780	-11,120	168	0,000	70	100	9,785	6,268	2,437	0,000
MBFTAN	25,143	23,990	2,466	168	0,015	70	100	2,720	3,180	1,366	0,169
MBFPZD	9,086	8,070	3,198	168	0,002	70	100	2,244	1,882	1,422	0,107
MBFPRK	26,200	24,695	1,541	168	0,125	70	100	5,520	6,741	1,491	0,079
MFLFLA	3,000	4,860	-4,213	168	0,000	70	100	2,438	3,078	1,595	0,041
MFLISK	72,436	75,730	-1,610	168	0,109	70	100	11,895	13,930	1,372	0,164
MFESDM	157,214	140,790	5,827	168	0,000	70	100	18,489	17,800	1,079	0,723
MFESLM	240,771	237,420	2,304	168	0,022	70	100	10,480	8,445	1,540	0,049
MFEBML	7,893	7,171	4,282	168	0,000	70	100	1,089	1,076	1,025	0,903
MFE20V	4,030	4,481	-8,398	168	0,000	70	100	0,299	0,373	1,549	0,055
MAGTUP	16,158	17,811	-6,321	168	0,000	70	100	1,535	1,771	1,331	0,208
MAGKUS	17,781	20,107	-8,891	168	0,000	70	100	1,595	1,735	1,183	0,459
MKTSRL	18,886	21,212	-7,466	168	0,000	70	100	1,858	2,091	1,267	0,297
MRCDTS	20,843	16,600	7,888	168	0,000	70	100	3,049	3,706	1,478	0,086
MSASKL	22,371	19,880	2,321	168	0,021	70	100	7,782	6,188	1,582	0,036
MRCZTL	34,243	22,970	9,162	168	0,000	70	100	9,040	6,987	1,674	0,019

CONCLUSION

According to the research criteria, answering the question of the requirement for engaging in sports, the sample was divided on two subsamples. In this research 170 girls were tested, from which 70 were defined as female students who regularly attend classes of physical education and are dealing with volleyball and 100 were defined as female students who regularly attend classes of physical education but are not dealing with any sport. The research was conducted with the main goal to partially establish the quantitative and qualitive differences in basic-motor abilities of female students at the age of 14-16 years dealing with sports (volleyball) and non athletes.

Based on the results of Wilk's Lambda which is ,27 and in association with Rao's R = 25,56 approximation and degrees of freedom df1 = 16 and df2 = 153, are giving a significant difference Q = .00 (p- level = 0.00) of the analyzed space, and it can be concluded that from the analyzed results between the groups there are qualitative differences in the examined space.

For determining the partial quantitative differences on univariate level between the two subsamples the t-test for small independent samples was used. The differences in the arithmetic means of the two groups of respondents (volleyball athletes and non athletes) were determined in the motor space. From the obtained results of the t-test it can be concluded that the analyzed groups of respondents statistically significantly differ in twelve variables.

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