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**DIFFERENCES IN EXPLOSIVE POWER OF THE LOWER LIMB BETWEEN YOUNG PEOPLE OF DIFFERENT AGES VOLLEYBALL***Abstract*

*Plyometrics is modern methods of work allowing individuals greater force than the development of what is possible, using a simple strength training. The explosive power is expressed through explosive jumping ability of the neuromuscular system, respondents to express muscle strain in the minimum time interval. The aim of the research is to examine whether there are statistically significant differences in work exercise for the explosive force of lower limbs among young volleyball players of different ages Cause respondents consisted of 20 young volleyball Volleyball Club "Klenak" 12 girls urzasta 10-12 years and 8 girls aged 12-14 godina. Za research was used battery of tests of 6 valid and reliable tests with evaluation of motor characteristics of explosive leg strength: Maximum reach with both hands from the city (DOH2RM); Maximum boom and the spike (DOHSM); The maximum reach of the block center (DOHBLM); The maximum reach of the block from the run-up (DOHBLZ); Standing long jump seats (MDM); Long jump with a running start (MDZ). The results suggest an association between two groups of girls different ages, where there are significant differences in the assessment of locomotor tests explosive strength of the lower extremities. Based on the obtained values it can be concluded that in this age group in these athletes differentiated differences in terms of explosive power lower ekstremiteta*

**Key words:** *plyometric training, eksperimentalna group, the control group, jump on the block, jump in the trash, motor tests.*

**1. INTRODUCTION**

Thinking about volleyball sports as a way of life in the entire system of sports, can be defined as an extremely complex phenomenon. In particular, it shapes human life and movement. It was created from the need to solve practical problems of people's behavior, which are the result of modern lifestyles. Interest in volleyball is shown for several reasons. One is the nature of volleyball movement that brings together a large number of children and youth. Through previous research has shown that volleyball can solve the problems of physical development of certain forms of behavior, and problems of spiritual and moral values. Today, kids at an early age involved in different schools and volleyball clubs, actively participate in competitions and to participation becomes an integral part of their lives. Therefore, it is increasingly present trend of increasing children's sports competitions both at national and international level. As a natural sequence of these phenomena, it is necessary to select the optimum selection as health,

constitutional and other characteristics of young people adapted to the game of volleyball. This is a precondition for the future direction and development potential volleyball / ice. Therefore, these children need to enable the development path from childhood to a successful adult athlete - volleyball, taking care not to endanger their health.

Stojanović and Kostic (2002) in their study examined the plyometric training model for developing explosive power (vertical jump). An experimental research on a sample of 33 volleyball players at the cadet level. Guided by the general principles of plyometric training, individual training plans were. To assess the effects of sports training to develop the vertical jump were administered three variables. For the purposes of this study were validated two tests for assessing the volleyball vertical jump on the block and jump in the trash. The experiment was carried out in the second part of the preparatory period, which lasted eight weeks, with two to three training sessions. The control group was trained by applying technical and tactical content. Based on the results of research and discussion reliably conclude that the model used to develop the vertical jump exercises, as the main factor in the experimental group, contributed to a statistically significant difference in increasing vertical jump compared to the control group for the development of the vertical jump benefit from the technical and tactical content.

The aim of the research is to examine whether there are statistically significant differences in work exercise for the explosive force of lower limbs among young volleyball players of different ages (10-12 years and 12-14 years) who did not undergo programmed work other than work in training.

## 2. METHOD

Cause of respondents consisted of 20 young volleyball Volleyball Club "Klenak" 12 girls urzasta 10-12 years and 8 girls aged 12-14 years. Respondents were in the training process.

For the study was used battery of tests of 6 valid and reliable tests with evaluation of motor characteristics of explosive leg strength, which are used in primary and secondary schools, as well as fakultetma. Motorički tests for assessing the explosive strength of the lower extremities: Maximum reach with both hands from the city (DOH2RM); Maximum boom and the spike (DOHSM); The maximum reach of the block center (DOHBLM); The maximum reach of the block from the run-up (DOHBLZ); Standing long jump seats (MDM); Long jump with a running start (MDZ).

## 3. RESULTS AND DISCUSSION

Table no. 1 provides a descriptive overview of the sample of respondents.

*Table 1. sample of respondents*

<b>sample of respondents</b>	<b>N</b>
Group I - girls aged 10-12 years	12
Group II - girls aged 12-14 years	8

Table 1. group SPSS statistics program we wrote the mean value (mean) and standard deviation (std. Deviation) for each group and each test for assessing the explosive strength of the lower extremities. In our case, the group 1 consists of 12 girls aged 10-12 years old, and Group 2 consists of girls aged 12-14 years.

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		
							Std. Error Difference	Upper	
<b>DOHZ RM</b>	8,581	,009	-5,072	18	,000	-20,750	4,091	-29,346	
			-4,365	8,669	,002	-20,750	4,753	-31,566	
<b>DOHS M</b>	6,811	,018	-4,312	18	,000	-22,375	5,189	-33,276	
			-3,611	7,909	,007	-22,375	6,196	-36,692	
<b>DOBL M</b>	7,940	,011	-4,636	18	,000	-18,125	3,910	-26,340	
			-3,900	8,026	,005	-18,125	4,648	-28,837	
<b>DOHB LZ</b>	8,046	,011	-4,846	18	,000	-20,375	4,204	-29,208	
			-4,004	7,576	,004	-20,375	5,088	-32,224	
<b>MDM</b>	,070	,794	-5,265	18	,000	-21,33333	4,05177	29,84579	
			-5,246	14,966	,000	-21,33333	4,06683	-30,00332	
<b>MDZ</b>	,453	,510	-5,168	18	,000	-21,58333	4,17626	30,35733	
			-5,033	13,785	,000	-21,58333	4,28798	-30,79364	

Legend: *The first two columns Leven's test for equality of variances -Levenov test of equality of variances; t -value of t-test; df - degrees of freedom; sig. (2-tailed) - significance of a two-way testing the arithmetic mean of the differences; meand difference-difference arithmetic means; stad. error difference - standard error of the difference; 95% confidece interval of the differnce - upper and lower limits of the interval differences with the confidence of 95%*

Table no. 2 Table no. 2 is given descriptive statistics show group among respondents, medium of values of variables tested.

**Tabela 2.** Group statistic

<b>Var.</b>	<b>Grupa</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
<b>DOHZR</b>	1	115,75	5,345	1,543
<b>M</b>	2	136,50	12,717	4,496
<b>DOHSM</b>	1	121,25	5,276	1,523
	2	143,63	16,987	6,006
<b>DOBLM</b>	1	111,50	4,189	1,209
	2	129,63	12,694	4,488
<b>DOHBLZ</b>	1	116,75	3,494	1,008
	2	137,13	14,106	4,987
	1	24,416 7	8,81588	2,54492
<b>MDM</b>	2	45,750 0	8,97218	3,17214
	1	29,916 7	8,68079	2,50593
<b>MDZ</b>	2	51,500 0	9,84160	3,47953

Legend: Mean - mean; Stad. deviation - the standard deviation; Std. mean error - error in the arithmetic mean.

The results suggest an association between two groups of girls different ages, where there are significant differences in the assessment of locomotor tests explosive strength of the lower extremities. Since the t value is negative, the difference is in favor of other groups, and girls 12-14 years old. Based on the column Sig. 2-tailed see significant differences between the 2 groups of subjects. All values are below the threshold  $p = 0.5$ .

Based on the obtained values it can be concluded that in this age in these groups of athletes differentiated differences in terms of explosive power lower ekstremiteta, and that the women's volleyball stronger leg muscles, with the assumption that older age category has a greater cross section of the muscle that provides more force in the exercise of work as well as under the influence of major effects of androgen hormones, but to take as assumption that needs to be tested in the next few research.

It is interesting to examine the relationship between the morphology of certain motor skills volleyball in relation to age. It is also necessary to assess other motor skills such as repetitive strength of trunk, arms and shoulders. Given the small sample size, these results can not be generalized, and therefore the necessary studies on larger samples of subjects, as well as longitudinal tracking the same group in the future in order to identify changes in expression of power after a certain training process.

#### 4. CONCLUSIONS

On the cause of the 20 patients, divided into two groups. The first group consisted of girls 10-12 years old, a second group of girls from 12-14 years of age. Applied motor tests with assessment of explosive leg strength. The aim of this study was to determine

the difference in explosive power of lower limbs between young volleyball players of different ages. The results showed that there are significant differences between the two groups of girls of different age categories.

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