

Original scientific paper**ORIGINAL SCIENTIFIC PAPER****Ekrem Hadžić¹, Bojan Gužina²**¹Armed Forces of Bosnia and Herzegovina²Faculty of Physical Education and Sports, University in Banja Luka, Bosnia and Herzegovina**UDK: 796.012.1:341.462.1****DOI: 10.7251/SHT1302034H****EFFICIENCY OF THE PHYSICAL TRAINING PROGRAM IN PROFESSIONAL MILITARY PERSONNEL IN THE ANNUAL EVALUATION OF PHYSICAL FITNESS****Summary**

The aim of this study was to determine the quantitative differences in morphological characteristics, motor and functional abilities under the influence of physical training in the annual evaluation of PMP. Tests were performed at baseline (entry test of physical fitness) and after six months (output test of physical fitness). The study was conducted on a sample of 88 PMP (professional military personnel) members AF and AD (Air Force and Defense) OS BiH. In our research, measuring instruments for the assessment of morphological characteristics, motor and functional abilities consisted of: body weight, push-ups, sit-- sit-ups and running at 3.2 km.

For an analysis of the difference between the initial and final measurements and t-test. Our results showed a statistically significant value in the final measurement in relation to the initial in all the variables and increase repetitive power arm, collar bone and body, aerobic endurance and reduce body weight.

Based on these results we can conclude that proper and regular physical training to successfully overcome the test of physical fitness in the annual assessment.

Key words: *physical fitness test PMP, motor abilities, T-test, physical training program.*

1.INTRODUCTION

Level of physical fitness of soldiers has a direct impact on his combat ability. Many battles underline a very important role that physical fitness plays on the battlefield. Physical education (physical training) is the foundation of combat readiness and should be an integral part of every soldier, petty officers and officers who lead them. Physical training is an integral part of combat training. It is a planned, systematic and continuous process of education of soldiers and elders (hereinafter referred to as soldiers). There are organized creative activities that contributes to physical development, developing psychological and physical capabilities and shaping the moral character of members of the Armed Forces.

The goal of weight training is to raise psychological and physical abilities of all members of the Armed to the level necessary for the successful execution of the most complex tasks in peace and war. The goals and tasks of physical training exercise is the realization of plans and programs for all forms of physical training: sports day and free sports activities.

Changes of the "state of trainees" are most often manifested in the area of some capabilities and features, especially in the field of motor skills. All these anthropological characteristics can be changed in quantitative and qualitative terms. By the quantitative changes refers to changes that are expressed on the rise or fall of the effectiveness of skills, abilities and / or motor information, while the qualitative changes imply changes in the relationship between these characteristics.

In the hypothetical equation specifications physical fitness of military units, the first place almost reserved for durability. The durability is one of aerobic and muscular endurance. Aerobic endurance occupies the first place, and was shown to be associated with the ability to run at a power factor (Males et al., 2001). Muscular endurance is the combination of strength and endurance, it is the ability to perform a large number of repetitions of exercises with some resistance over time (Bompa and Carrera, 2005). There is no doubt that with aerobic endurance training, strength training is the foundation on which to build further training in troops. Also, muscular endurance has a positive transfer on cardiorespiratory (aerobic) endurance (Bompa and Carrera, 2005). When soldiers, given the tasks, specific power leg muscles - running, walking, arms and shoulders - climbing, carrying cargo back - climbing; troops - stabilizers in all activities (hiking and climbing as part of a special combat training and hill mountain units of the police and armed forces, Hadzic and Mujanović, 2009). Motor skills and a high degree and in different ways influence: long-term exploitation of fundamental movement skills, effectively mastering complex biomechanical and biomechanical simple motor tasks (efficiency mastering military training ground infantry obstacles Metikoš et al., 1988). It is extremely important leg strength, shoulder belt and extensors of the body in a very important activity of soldiers - long walk from carrying cargo. Structure of basic motor abilities and anthropometric characteristics during military training is determined mainly specific military tasks (Bajrić and Mikic, 2002). In many foreign units this activity is considered most important for soldiers (Deuster, 1997). All programs of physical training in the initial entry training must do the following : gradually improving fitness and strengthen soldiers for military duty, self- development, rules and team spirit soldiers, developing a healthy lifestyle through teaching, improvement of physical fitness to the highest possible level (Heberlein et al. 2005). Linkage polygons infantry obstacles with some physical abilities to not selected sample of respondents and showed significant correlation with the latent dimensions of coordination and aerobic - anaerobic endurance, and somewhat explosive strength (Rodic, 1988). With regard to the specific activities of special units there is a need for different forms of strength training (Šopar, 2008). Studying a result of the process of exercise on the human body is one of the most significant concerns of science kinesiology (Mraković, 1994). Efficiency of physical education and the development of motor abilities of students of military academies in the course of a four-year education at a military academy in the case study (Maric, 2008).

The main problem of the research is the analysis of qualitative (structural) and quantitative changes in the morphological characteristics, motor and functional abilities under the influence of physical training.

The main objective of this study is to determine the efficacy of the program of fitness training followed by two time points on the qualitative and quantitative changes in the morphological characteristics, motor and functional abilities.

2. METHODS

2.1. The sample of the examinee

The research was conducted on a sample of 88 PMP (professional military personnel) members AF and AD (Air Force and Air Defense) OS BiH.

2.2. The sample of the variables

The process of testing and measurement, that is the evaluation of morphological characteristics, motor and functional abilities was conducted through four variables:

- | | |
|--------------------------------|-----------------|
| 1. Body weight | (ATLMAS) |
| 2. Push ups | (MRESKL) |
| 3. Raising troops - abs | (MREDTT) |
| 4. Running at 3.200 m | (FAET32) |

Initial measurement (input test of physical fitness) is made at the end of April and the final measurement (output test) in the beginning of October 2010th Year. All tests were carried out in the morning at the football stadium with a running track.

These tests provide a measure of cardio-respiratory muscle and physical endurance. It is a test that allows the expression of faculty soldiers. Standards are adapted to age. The intent of this test to check the body's ability is to give assessment of the physical training program. PVL have this test at least twice a year every year with minimal gap of four months if given only two test of records. All soldiers must achieve at least 60 points in each of exercises (push-ups, lifting the hull - sit-ups and running at 3.2 miles) and a total of not less than 180 points.

For evaluation of body weight was used portable scales at a feather, the accuracy of measurement of the scale that provides a 0.5 kg, the scale was set on solid ground (concrete), and its accuracy is verified weights weighing 10 kg.

For the assessment of repetitive muscle strength chest, shoulders and triceps is used a push ups test. Measured by the number of correctly performed push-ups in the course of 2 minutes.

To assess repetirivne abdominal muscle strength and hips muscle is used a test of lifting hull - abs. Measured by the number of correctly performed sit-ups in the course of 2 minutes.

To assess aerobic endurance and muscular endurance leg is used the test of running at 3.2 km. You have to run the trail of 3.2 km as fast as possible.

2.3. Methods of data process

To determine the quantitative difference between the initial and final measurement of morphological characteristics, motor and functional abilities is used T-test.

3.RESULTS WITH DISCUSSION

Analysis of the difference between the initial and final states of morphological characteristics, motor and functional abilities of the PVL was performed using T-test.

The analysis of the obtained results it can be concluded that during the experimental period, in the final compared to the initial measurement, significant differences were found in tests of morphological characteristics (body mass FATLMAS .000), repetitive strength (pushups FMRESKL .000 and lifting HULL - abs FMREDTT .000) and cardiovascular endurance (FFAET32 .000).

Chart 1. Descriptive parameters: arithmetic mean (Mean), the sample of respondents (N), standard deviation (Std.Deviation), standard error of the mean (Std.Error Mean).

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	ATLMAS	85.89	88	10.340	1.102
	FATLMAS	85.09	88	9.634	1.027
Pair 2	MRESKL	46.50	88	9.839	1.049
	FMRESKL	48.55	88	9.897	1.055
Pair 3	MREDTT	49.72	88	9.869	1.052
	FMREDTT	51.24	88	9.845	1.049
Pair 4	FAET32	16.27489	88	1.418370	.151199
	FFAET32	16.10364	88	1.341349	.142988
Pair 5	BODSKL	71.10	88	8.210	.875
	FBODSKL	73.23	88	8.045	.858
Pair 6	BODDTT	69.45	88	7.652	.816
	FBODDTT	71.13	88	7.247	.773
Pair 7	BODT32	72.17	88	10.929	1.165
	FBODT32	73.70	88	10.069	1.073

The variables of body weight (ATLMAS) has undergone significant changes. Under the influence of physical exercise decreased body fat as can be seen in the difference of the final measurement compared to the initial one. That's certainly contributed to the proper dosage distribution and control of the applied load, methodical shaping of training in which they were particularly important methods of exercise in accordance with individual abilities and characteristics of respondents. Variable pushups (MRESKL), which is estimated to be capable of isometric work and

work on the basis of alternating contraction and relaxation (isotonic) muscle groups arms and shoulders, showed in the final measurements the greatest improvement over the remaining variables. Also, the variable of lifting hull – sit ups is confirmed a statistically significant difference compared to the initial measurement. The variables running at 3.2 km, which is estimated aerobic endurance and muscular endurance leg, it can be concluded that during the period of physical training in the final compared to the initial measurement of a statistically significant difference (FAET32 16.27489 - 16.10364 FFAET32). All of these improvements can be attributed to the effects of programmed curriculum of physical training.

Chart 2. *Correlations between variables of the initial and final measurement (Correlation), the level of significance (sig.)*

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	ATLMAS & FATLMAS	88	.997	.000
Pair 2	MRESKL & FMRESKL	88	.976	.000
Pair 3	MREDTT & FMREDTT	88	.987	.000
Pair 4	FAET32 & FFAET32	88	.986	.000
Pair 5	BODSKL & FBODSKL	88	.960	.000
Pair 6	BODDTT & FBODDTT	88	.965	.000
Pair 7	BODT32 & FBODT32	88	.976	.000

Chart 3. *Multivariate Hottelingov T-test: differences of the arithmetic means of final and initial measurements (Mean), standard deviation of the difference (Std.Deviation), difference in standard error of means (Std.Error Mean), the confidence interval for the mean (95% Confidence Interval of the Difference), the value of the lower quartile (Lower), the value of the upper quartile (Upper), t-test (t), degrees of freedom (df), significance level (sig.).*

aired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	ATLMA S – FATLMAS	.795	1.019	.109	.580	1.011	7.324	87	.000
Pair 2	MRESKL – FMRESKL	-2.045	2.144	.229	-2.500	-1.591	-8.951	87	.000
Pair 3	MREDTT – FMREDTT	-1.523	1.619	.173	-1.866	-1.180	-8.825	87	.000
Pair 4	FAET32 - FFAET32	.171250	.246053	.026229	.119116	.223384	6.529	87	.000
Pair 5	BODSKL – FBODSKL	-2.125	2.298	.245	-2.612	-1.638	-8.673	87	.000
Pair 6	BODDTT – FBODDTT	-1.670	2.021	.215	-2.099	-1.242	-7.753	87	.000
Pair 7	BODT32 - FBODT32	-1.534	2.473	.264	-2.058	-1.010	-5.820	87	.000

Insight in Chart nr. 3 can be concluded that the obtained statistically significant differences in all variables. Greatest statistical significance achieved variable (MRESKL -2045), the variable lifting fuselage-abs (MREDTT -1523), the variable body weight (ATKMAS 795) and variable running at 3.2 km (FAET32 .171250). These results were expected due to the structure and purpose of programmed six-month training process of physical training.

4. CONCLUSION

Results obtained values of T-test showed that at the end of the experimental treatment using the program of physical exercise on the development of motor and functional abilities of the patients there was a statistically significant change. Individual contribution significant difference was achieved in all tests of motor and functional abilities, and the anthropometric measure body weight.

Based on the results of the entrance test (initial measurement), we know that a physical fitness did not satisfy the 13 members of the 88 PVL, while the output test (final measurement) did not meet the two members of the 88 PVL. Statistically significant differences can be attributed to implementation of their programs of physical training that was saturated content of repetitive power arm, collar bone and body, as well as facilities for the development of aerobic fitness. Thus, continuous and programmed process of physical training contributes to the necessary development of PVL in the motor, functional and health terms, and allows to successfully overcome the test of physical fitness in the annual assessment.

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