

STUDY OF AUTHOR'S APPLIED PHYSICAL TRAINING PROGRAM FOR MILITARY OFFICERS-GRADUATES OF RESERVE OFFICERS' DEPARTMENTS

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Abstract. *Purpose:* to test effectiveness of applied physical training program for military officers, called up to military service after graduation from reserve officers' departments. *Material:* the research was conducted on the base of Educational center 184 from June 2014 to December 2015. In the research 80 military officers participated (n=30 – graduates of military higher educational establishments; n=26, n=24 – graduates of reserve officers' departments) of 22-27 years' age. *Results:* we fulfilled analysis of military officers' physical fitness by exercises, which characterize general physical fitness and military applied skills (100 meters' run, chin ups, 3000 meters' run, passing obstacles course, grenade throws for distance and for accuracy, 5 km march-rush). We worked out the program, the essence of which implies ensuring of physical fitness and acceleration of reserve officers-graduates' adaptation to professional (combat) functioning. *Conclusions:* it was proved that implementation of the author's program influenced positively on perfection of general physical qualities and military applied skills of military officers-graduated of reserve officers' departments ($p < 0.05-0.001$).

Key words: author's program, reserve military officers, military service, physical loads.

Introduction

The process of reformation and development of Military Forces of Ukraine (MFU) requires from military administrations to concentrate efforts on perfection of work with young military officers. Military officers' staff is replenished by graduates of military higher educational establishments (MHEE) and civil higher educational establishments (HEE) [2, 7]. Effectiveness of mastering of most of professions depends on quality and formation level of motor skills and abilities. That is why the problem of objective content of physical training forms of military officers (called up from reserve) is one of the most important in theory and practice of physical training [9, 10].

Our previous researches proved that physical fitness level of military officers (graduated of reserve officers' departments ROD) does not meet requirements of Instructions on physical training of Military Forces of Ukraine. Besides, it was found that physical training tests were passed only by 54% of officers ($p < 0.01$). From them 83% did not fulfill exercises for endurance. It witnesses about absence of organism systems' readiness for professional tasks' execution [5, 9].

Results of researches [8-12] proved that 65.6% of officers (called from reserve) are not able to fulfill applied exercises: grenade throws for distance and accuracy; passing of obstacle course; martial arts techniques; 5 km march-rush [8, 11, and 12]. That is why seeking of new methodic, programs and exercises, which would permit for this contingent of military officers to quicker adapt to military service and be ready for fulfillment of their duties, is rather urgent.

Basing on analysis of many scientific works [3, 4, and 6] and on our own researches we worked out program of applied physical training of military officers- ROD graduates. It implies ensuring of physical fitness and acceleration of military officers-graduates' adaptation to professional (combat) functioning.

Purpose, tasks of the works, material and methods

The purpose of the research is to test effectiveness of applied physical training program for military officers, called up to military service after graduation from reserve officers' departments.

The research was conducted on the base of Educational center 184 from June 2014 to December 2015. In the research 80 military officers participated (n=30 – graduates of military higher educational establishments; n=26, n=24 – graduates of reserve officers' departments) of 22-27 years' age with statistically uniform indicators of physical condition and physical fitness ($p > 0.05$).

Results of the researches

For testing the author's program effectiveness we tested military officers, servicing by contract after graduation from ROD (EG and CG1) and military officers, who graduated from MHEEs (CG2). Physical fitness level was tested

with the help of exercises from Instructions on physical training in Military Forces of Ukraine, which characterize general physical fitness and military applied skills: 100 meters' run, chin ups, 3000 meters' run, passing obstacles course, grenade throws for distance and for accuracy, 5 km march-rush.

100 meters' test showed that at the beginning of experiment CG2 military officers had confidently better indicators than EG and CG1 ($p < 0.05-0.01$). Between officers of EG and CG1 there was no confident difference ($t=0.36$; $p > 0.05$). After implementation of the author's program EG indicators confidently improved in respect to initial data by 0.4 sec. ($t=2.51$; $p < 0.05$). Indicators of officers, who were trained by traditional program, confidently did not change during formation experiment. For example, in CG2 mean time of 100 meters' run did not change. This indicator was 14.1 sec. ($p > 0.05$). Mean time of this exercise's fulfillment by CG1 officers even worsened by 0.2 sec. ($p > 0.05$).

Officers' testing in 100 meters' run at the end of experiment showed confident difference between CG1 and CG2 military officers ($t=4.07$; $p < 0.001$) and between indicators of CG2 and EG ($t=2.85$; $p < 0.01$). So, confident difference between CG2 and EG indicators ($t=0.88$; $p > 0.05$) was absent. At the beginning of experiment such difference was present: $t=2.95$; $p < 0.01$.

Strength was tested with exercise "chin ups". Initial results in EG and CG1 (ROD graduates) had no confident differences ($t=0.34$; $p > 0.05$). But they were confidently worse than indicators in CG2 (graduates of MHEEs) ($t=6.21$; $p < 0.001$). Thus, we confidently determined that strength level of officers-ROD graduated did not correspond to required level.

During formation experiment CG2 indicators reduced 0.6 times ($p > 0.05$), and CG1 – 0.3 times ($p > 0.05$). Indicators of military officers, who were trained by author's program, improved 0.8 times ($t=3.39$; $p < 0.01$). At the end of experiment indicators in EG and CG1 became confidently different 1.0 times ($t=3.86$; $p < 0.001$). At the beginning of experiment EG chin ups indicators were worse than in CG2 2.1 times ($t=6.41$; $p < 0.01$). At the end of formation experiment difference between officers of these groups was 0.7 times ($t=2.11$; $p < 0.05$). It was proved that implementation of the author's program permitted to confidently improve indicators of military officers' strength ($p < 0.01$).

Endurance was assessed by results of 3 km run test. This exercise was fulfilled by military officers in field uniform, without ammunition. Initial testing showed that there was no confident difference between indicators of EG and CG1 ($t=0.84$; $p > 0.05$). Their results were confidently worse than the results of MHEEs graduated by 68.5 sec. ($t=5.60$; $p < 0.001$) and by 80.8 sec. ($t=6.58$; $p < 0.001$). It proves that general endurance of civil HEEs and ROD graduates is low and does not meet the required level. Among the tested officers only 21% fulfilled this exercise "satisfactory" for their age group.

The received data are given in table 1.

Table 1. 3 km run indicators (EG, n=24; CG₁, n=26; CG₂, n=30), sec.

Stage	CG2			CG1			EG			p (CG 2- CG 1)	p (CG 1- EG)	p (CG 2- EG)
	\bar{x}	σ	m	\bar{x}	σ	m	\bar{x}	σ	m			
Beginning	738.7	28.79	6.44	807.2	53.03	10.40	819.5	51.30	10.47	$t=5.60$ < 0.001	$t=0.84$ > 0.05	$t=6.58$ < 0.001
End	749.0	22.00	4.92	815.1	22.72	4.46	782.5 *	62.43	12.74	$t=9.90$ < 0.001	$t=2.41$ < 0.05	$t=2.43$ < 0.05

Notes: * < 0.05 .

At the end of formation experiment it was found that implementation of the author's program of applied physical training influenced positively on general endurance of military officers. At the end of experiment testing showed that in EG 3 km run indicators significantly improved by 37 sec. ($t=2.24$; $p < 0.05$). In other groups there was insignificant worsening of results by 10.7 sec. ($p > 0.05$) in CG2 and by 7.9 sec. ($p > 0.05$) in CG1.

Comparative analysis of indicators showed that after finishing of the author's program implementation EG results became much better than CG1 indicators (officers, called up after graduation from MHEEs) ($t=2.41$; $p < 0.05$).

With it, indicators of EG officers were confidently worse than indicators of CG2 officers ($t=2.43$; $p<0.05$). At the beginning of testing difference between indicators was 80.8 sec. ($t=6.58$; $p<0.001$). At the end of experiment such difference was 33.1 sec. ($t=2.43$; $p<0.05$). Results of CG1 officers also were confidently lower than EG results. At the beginning of experiment it was 68.5 sec. ($t=5.60$; $p<0.001$). At the end of formation experiment the difference was 65.7 sec. ($t=9.90$; $p<0.001$): no changes in mean time of 3 km run were found in this group.

Thus, T testing of military officers' general endurance showed that existing program of physical training, its content and training methodic do not permit to achieve required level of physical fitness (of officers, who already have formed physical skills). The program also does not permit to form or perfect physical qualities of officers, who, before military service, did not receive proper physical fitness.

Results of EG officers' testing (who were trained by author's program of applied physical training) proved that applied trainings by their structure approach to military officers' professional functioning. It permits to confidently perfect officers' physical qualities ($p<0.05-0.001$) and approach their level to the required for fulfillment combat tasks. For determination of effectiveness of the author's program of officers' applied skills' formation and development we tested military officers with exercises. It permitted to find the level of skills, required by military officers, independent on their specialty.

One of such exercises is the obstacle course, which characterizes dexterity and special endurance; coordination, courage and decisiveness. Analysis of initial obstacle course indicators showed that results of CG2 were confidently better than in EG ($\Delta X=36.9$ sec.; $t=8.51$; $p<0.001$) and in CG1 ($\Delta X=41.8$ sec.; $t=9.78$; $p<0.001$). Though, no confidence difference was found between EG and CG1 (graduated from RODs) ($t=0.90$; $p>0.05$).

After formation experiment indicators of all groups changed in the following way: in EG results confidently improved by 19.7 sec. ($t=4.29$; $p<0.001$); in CG1 results also improved, but without confident difference in respect to initial data ($\Delta X=10.4$ sec; $p>0.05$).

Comparative analysis of obstacle course results at the end of formation experiment showed that CG2 indicators remained confidently better than indicators of CG1 by 22.8 sec. ($t=4.36$; $p<0.001$) and, comparing with EG officers, by 8.6 sec. ($t=2.23$; $p<0.05$). With it, mean result of CG1 officers was worse than in EG (trained by the author's program) by 14.1 sec. ($t=2.92$; $p<0.01$). Thus, it was proved that implementation of the author's program confidently positively influenced on perfection of applied physical skills ($p<0.01$).

The next applied skill is grenade throws for distance. It is a complexly coordinated exercise. For its fulfillment it is necessary to have certain physical qualities and trained technique of throw. The exercise was fulfilled with standard grenade F-1, of 700 g. weight.

Testing results showed that at the beginning of experiment there was no confident difference between officers-ROD graduates ($t-t_1$ 0.90; $p>0.05$). But they were confidently worse than in CG2 (graduates from MHEEs) by 2,1 m ($t=2.58$; $p<0.05$) in CG₁ and by 2.9 m ($t=3.46$; $p<0.01$) in EG.

After formation experiment dynamic of grenade throws' for distance results was as follows: CG2 results reduced by 0.4 m ($p>0.05$); CG1 results improved by 0.2 m ($p>0.05$) and EG results confidently improved by 2.2 m ($t=2.53$; $p<0.05$) in respect to initial data.

So, let us pay attention to comparative analysis of grenade throws at the end of experiment. Indicators of CG1 and CG2 confidently differ ($t=2.12$; $p<0.05$) at the beginning and at the end of experiment. Results of EG and CG1 do not confidently differ at the end of experiment ($t=1.80$; $p>0.05$). At the beginning of experiment difference of mean indicators of grenade throw for distance was 0.8 m ($p>0.05$) and at the end of experiment it became 1.6 m ($p>0.05$). Besides, it is interesting that we did not find any confident difference between CG2 and EG results at the end of experiment. Difference between results was only 2.9 m ($t=3.46$; $p<0.01$).

Next exercise was grenade throw for accuracy. Result of the exercise implies hitting in circle from three attempts. Initial testing showed that only 37.1% of officers (ROD graduates) can fulfill this exercise. Most of them even were not able to throw grenade to control circle. Accordingly initial data of CG2 officers were confidently better than in CG1 ($t=6.47$; $p<0.001$) and EG ($t=6.11$; $p<0.001$). With it, between groups of ROD graduates there was no confident difference ($t=0.10$; $p>0.05$).

Implementation of the author's program permitted to confidently improve EG results of this exercise: quantity of hits in control circle increased 0.6 times ($t=3.44$; $p<0.01$). In CG1 this indicator increased only 0.1 times ($p>0.05$).

Comparing of EG and CG1 results of grenade throws for accuracy showed confident difference at the end of experiment – 0.5 hits ($t=245$; $p<0.05$). But results of RODs graduates (both in EG and CG1) were confidently lower than results of MHEEs graduates. For example, indicators of CG2 officers were better than in EG 0.6 times ($t=2.60$; $p<0.01$) and 1.1 times better than in CG1 ($t=4.31$; $p<0.001$).

Analysis of 5 km march-rush results showed that from ROD graduates only 7% could fulfill this test. That is why formation experiment included this exercise as compulsory element. At the beginning of experiment time of march-rush fulfillment by MHEEs graduates was confidently better than the same of RODs graduates. For example, CG2 result was better than in CG1 by 140.2 sec. ($t=7.37$; $p<0.001$) and better than in EG by 163.2 sec. ($t=9.97$; $p<0.001$). With it, difference between EG and CG1 indicators was 23 sec. and it was not confident difference ($t=1.08$; $p>0.05$).

By results of formation experiment, conducted as per the author's program, we found that officers' indicators reduced in respect to initial data. In CG2 mean time of this exercise's fulfillment worsened by 16.6 sec. ($p>0.05$) and in CG1 results of march-rush fulfillment reduced by 36.6 sec. ($p>0.05$). EG results (trained by the author's program) improved, in respect to initial data, by 73.1 sec. ($t=3.55$; $p<0.001$).

Comparative analysis of final 5 km march-rush indicators showed that mean time in EG was confidently better than in CG1 by 86.7 sec. ($t=2.79$; $p<0.01$). That is, we determined positive influence of the author's program on perfection of military officers' applied skills.

One and half year of experiment is not sufficient period for improvement of physical qualities of officers, who did not graduate from MHEEs. CG2 results were confidently better than CG1 indicators by 160.2 sec. ($t=6.40$; $p<0.001$) and better than in EG by 73.5 sec. ($t=3.70$; $p<0.001$).

Thus, by results of formation experiment we proved that implementation of the author's program positively influenced on perfection of general physical qualities and military applied skills of military officers ($p<0.05-0.001$). Applied content of the author's program permits to form required for fulfillment of professional duties officers' skills. Such approach permits to maintain or even to improve general physical qualities of military officers.

Discussion

Analysis of scientific works showed that in present conditions professional functioning has certain peculiar features and put forward high requirements to physical and psychological fitness of military officers [1, 12]. Our previous researches proved that level of RODs graduates' fitness was insufficient for fulfillment of professional and combat tasks [9, 10]. Our present research supplemented results of scientists V.V. Vandenko [1] and I.L. Shliamar [12] about positive influence of physical exercises on physical fitness and health of military officers.

We worked out program of applied physical training for military officers – RODs graduates. Its essence implies ensuring of physical fitness and acceleration of reserve officers-graduates' adaptation to professional (combat) functioning. Applied content of this program permits to form required for effective professional functioning officers' qualities. Besides, it was found that this program permits to maintain and improve physical qualities in process of physical trainings.

Conclusions:

The fulfilled research found that physical fitness level of reserve officers' departments' graduates (CG1) by results of exercises for general physical fitness and for military applied skills was confidently lower than in graduates of military higher educational establishments (CG2) ($p<0.05-0.001$). It witnesses about insufficient effectiveness of acting physical training program.

The fulfilled analysis of physical fitness in experimental group (EG), comparing with control group (CG1) showed confident differences practically by all indicators: 100 meters' run ($t=2.85$; $p<0.01$), chin ups ($t=3.86$; $p<0.001$), 3000 meters' run ($t=2.41$; $p<0.05$), obstacle course ($t=2.92$; $p<0.01$), grenade throws for distance ($t=1.80$; $p>0.05$) and for accuracy ($t=2.45$; $p<0.05$), 5 km march-rush ($t=2.79$; $p<0.01$). It witnesses about effectiveness of applied physical training author's program of officers, called up after graduation of reserve officers' departments.

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Conflict of interests

The author declares that there is no conflict of interests.

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