SPORT I TURYSTYKA
Środkowoeuropejskie Czasopismo Naukowe

UNIWERSYTET JANA DŁUGOSZA
W CZĘSTOCHOWIE

2025
t. 8, nr 3

Received: 16.02.2024
Accepted: 23.10.2024

http://dx.doi.org/10.16926/sit.2025.03.06

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ARMY COMBAT FITNESS TEST EVALUATION FOR AIR FORCES LIAISON SERVICEMEN

How to cite [jak cytować]: Korchagin, M., Olkhovyi, O., Indyka, S., Zonov, O., Bolshakov, O., & Melnykov, A. (2025). Army Combat Fitness Test evaluation for Air Forces Liaison Servicemen. *Sport i Turystyka. Środkowoeuropejskie Czasopismo Naukowe*, *8*(3), 103–120.

Ocena wojskowego testu sprawności bojowej dla żołnierzy Łącznikowych Sił Powietrznych

Streszczenie

Siły Zbrojne Ukrainy nadal korzystają z testów z byłego radzieckiego systemu wojskowego treningu fizycznego, opracowanego w ubiegłym stuleciu. Artykuł poświęcony jest rozwiązaniu aktualnego problemu wykorzystania Army Combat Fitness Test do oceny gotowości fizycznej żołnierzy Sił Zbrojnych Ukrainy. Badania miały na celu poznanie przez żołnierzy ćwiczeń ACFT, ocenę sprawności fizycznej, ocenę wykonywania przez żołnierzy zadań bojowych oraz zbadanie związku wyników ACFT z realizacją zadań bojowych. W badaniu wzięło udział 78 żołnierzy (sami mężczyźni, średni wiek – 27,7 lat) z jednostek łączności Sił Powietrznych. 8-tygodniowe badanie wykazało

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poprawę wyników ACFT personelu łączności Łącznikowych Sił Powietrznych. Wyniki ćwiczenia podwinięcia nogi wykazały wzrost o 36,6%, pompek – 26,4%, trzykrotnego maksymalnego martwego ciągu – 12,7% wzrostu, rzutu siłowego w pozycji stojącej – wzrost o 7,3%, a biegu na 2 mile – poprawę o 4,5%. Po opanowaniu ćwiczeń w jednostce odsetek żołnierzy, którzy zdali egzamin ACFT, wzrósł o 55,1%. Prawie wszystkie przypadki wykonywania ACFT (z wyjątkiem podwinięcia nogi) wykazują obecność statystycznie wiarygodnej umiarkowanej (od 0,31 do 0,7) korelacji z wynikami zadań wojskowych realizowanych przez personel Jednostki Łącznikowej Sił Powietrznych. Ogólnie rzecz biorąc, całkowita punktacja ACFT wykazywała istotnie umiarkowaną (od 0,31 do 0,7) korelację z realizacją zadań wojskowych. Wyniki przeprowadzonego eksperymentu potwierdziły możliwość wykorzystania kompleksu ćwiczeń ACFT do oceny fizycznej gotowości bojowej żołnierzy Sił Zbrojnych Ukrainy.

Słowa kluczowe: ACFT, ocena fizycznej gotowości bojowej.

Abstract

The Armed Forces of Ukraine still use Physical Fitness tests from the former Soviet system of military physical training, developed in the last century. The article is assigned to solve an actual issue of Army Combat Fitness Test application for Physical Military Readiness evaluation in Armed Forces of Ukraine. The study was directed on ACFT mastering by servicemen, physical fitness evaluation and assessment of Military Tasks Performance and investigation of relationships between ACFT results and Military Tasks Performance. 78 servicemen (male, the average age – 27.7 years) from Air Forces Liaison units were engaged. An 8-week study demonstrated improvement in ACFT performance by Air Forces Liaison personnel. Leg tuck results demonstrated 36.6 % increase, Push-ups – 26.4 % increase, 3-Repetition maximum deadlift – 12,7 % increase, Standing Power Throw – 7.3 % increase and 2-mile Run demonstrated 4.5 % improvement. ACFT events (except of Leg tuck) demonstrated correlation (from 0.31 to 0.7) with the results of Military Tasks. In general, total ACFT scoring showed significantly moderate correlation with Military Tasks Performance. The results of the conducted experiment proved the possibility of using the ACFT to assess the Physical Military Readiness of servicemen in Armed Forces of Ukraine.

Keywords: ACFT, Physical Military Readiness evaluation.

Introduction

Modern combat operations require a higher level of psychical standards and physical fitness of a soldier. To determine the degree of readiness of a serviceman or military unit to perform combat tasks, the commander needs to assess the level of motor skills development (Foulis et al., 2017; Szivak & Kraemer, 2015). According to Withrow et al. (2023), physical fitness evaluation of military personnel is vital because it can gauge the readiness of soldiers to perform military tasks in a combat environment. Proverbially, military personnel have some of the most physically demanding jobs within our society. Combat tasks vary, but may require maximal or near maximal physical exertions over extended periods of time.

Oderov et al. (2022) contended that the Armed Forces of Ukraine faced the lack of a process for Physical Military Readiness evaluating of personnel. According to Oderov et al. (2013, 2021), the system of physical fitness assessment in the Armed Forces of Ukraine is designed to solve the problem of determining the degree of formation of physical abilities such as speed, strength and endurance levels. But all the tests used to assess soldiers' physical abilities come from the former Soviet system of military physical training: 100 m run (speed assessment), pull-ups (strength assessment) and 3000 m run (endurance level assessment). This may lead to a discrepancy between the physical abilities level of the military personnel and the requirements for physical readiness, training and coherence of units which is necessary for the implementation of combat capabilities.

In the U. S. Army, research aimed on the development of modern exercise complexes for Physical Military Readiness evaluation has been going on since the end of the last century. Finally, several variants of fitness tests were developed: in 1980, 2002 and 2010 (Knapik et al., 2014; Hauschild et al., 2014; Jones et al., 2015). The last variant, named the Army Physical Fitness Test (APFT), consisted of 2-min push-ups, 2-min sit-ups, and a 2-mile run. It was known as one that was created when the U.S. Army was shifting away from combat readiness to health-related fitness outcomes which focused on cardiorespiratory health and fitness. East (2012) contended that the APFT requires minimal equipment and set up, which essentially limited its range of assessment from inception. According to East (2012), the APFT had a detrimental effect on the U.S. Army's physical military readiness culture due to soldiers training for the test, which, as stated, did not relate to combat readiness. Therefore, the APFT and other old tests were not recognized as reliable and have been criticized for lack of evidence to support their link to military fitness for every soldier (Palevych, 2018). For example, the APFT measured muscular and aerobic endurance, but, according to Inman et al. (2020) and Withrow et al. (2023) disregarded other important special physical abilities, critical for military personnel, including strength, power, and anaerobic endurance. To help evaluate the APFT and ensure a future test is associated with soldiers' performance of common physical job requirements, the U.S. Army Public Health Command has applied a Systematic Review (SR) methodology to identify and synthesize published correlations between military task performance and physical fitness tests (USAPHC, 2014; USAPHC, 2015). This fact proves that US Army administration was constantly focused on improving the physical fitness assessment for military personnel. Therefore, the U.S. Army began developing a new fitness test which had the following goals aiming to improve overall physical military readiness of the force: improve soldier and unit readiness, transform the Army's fitness culture, reduce preventable injuries and attrition, and enhance mental toughness and stamina (US Army Headquarters, 2019). Finally, in 2020, the Army Combat Fitness Test was ap-

proved and found to meet the validity requirements (Palevych et al., 2021). The US Army has replaced the old physical fitness test (Army Physical Fitness Test; APFT) with a new test that should better evaluate the physical fitness necessitated by combat – the Army Combat Fitness Test (ACFT). The ACFT is purported to be an accurate measure of the Functional Motor Competence components required to be performed on the modern battlefield, and investigating the relationships between the ACFT and Military Tasks Performance can potentially shed light on Physical Military Readiness (Withrow et al., 2023). The topicality of our study is predetermined by the necessity of resolution of the issue concerning the expediency of foreign fitness tests used in Physical Military Readiness evaluation in the Armed Forces of Ukraine.

Based on the foregoing, **the aim of this study** was to answer the question about the Army Combat Fitness Test application for Physical Military Readiness evaluation in the Armed Forces of Ukraine.

Material and methodology

Study participants. 78 servicemen (only male) from Air Forces Liaison units were engaged in the study. The average age of servicemen at the beginning of the experiment was 27.7 years. All of the military personnel were individually evaluated for the physical fitness verification procedure in accordance with the requirements of the Army Combat Fitness Test. All participants were informed about participating in an experiment and gave their consent.

Study design. The research was conducted from June till August 2020 (8 weeks) on the Air Force military base (Liaison Battalion) located in Lviv region. It was focused on the ACFT mastering by servicemen, physical fitness evaluation and assessment of Military Tasks Performance (military applied physical tests and professional level skills). The ACFT was used for physical fitness evaluation. Pre-test – post-test design was used to determine the ACFT mastering progress by Liaison units' servicemen.

For physical fitness evaluation the participants performed the exercises in the following order:

1. 3 Repetition maximum deadlift;
2. Standing power throw;
3. Hand release push-up;
4. Sprint-drag-carry;
5. Leg tuck;
6. Two-mile running.

Military applied physical tests evaluation was made according to Special Physical Training Standards (SPTS), adopted by General Staff of the Armed

Forces of Ukraine in June 2019 – ВП 7-00(01).01 (VKDP 7-00, 2020). For military applied physical tests evaluation the participants performed the following exercises: 3 km obstacle course, Complex strength, speed and agility test, Agility test, Special power endurance test, Casualty transportation, Ammunition delivery to the firing position.

3 km obstacle course. The distance is measured in segments of 500 m and is equipped with two obstacles (fences) height 110 cm, thickness 30 cm, length at least 4 m. Obstacles are installed at a distance of 150 m from the start – the first, 150 m from the turn – the second. During the distance run, 10 obstacles are overcome. Equipment: an assault rifle, four magazines, a gas mask. Perform the task in no more than 15 minutes 40 seconds.

Complex strength, speed and agility test (for Half-Squad – 4 servicemen). The distance is 60 m long; 50 m equipped for carrying or dragging a 100 kg box, 50 m for crawling in the Plastun style, 50 m for unwinding and winding a 50 m long field cable using a reel, an area for inventory loading and pulling out four earthing stakes at least 80 cm long. At the command unload: a box, a field cable with a reel, a sledgehammer and four grounding stakes from the car. Move or drag the 100 kg box for 50 m, take a lying position and crawl 50 m in the opposite direction. For the first pair, take a sledgehammer, earthing stakes and drive 4 stakes so that 80 percent of the stake is in the ground, and the distance between the stakes is 1 m, pull the stakes out of the ground, put the sledgehammer and stakes in the car. For the second pair, unwind the cable for 50 m to the box simulating the connection, then in the reverse direction wind the cable on a reel. Put the cable with the reel in the car. Equipment: helmet, body armor, an assault rifle, four magazines, a gas mask. Perform the task in no more than 11 minutes.

Agility test. The distance is 70 m, equipped with seven sections of 10 m each for running, crawling in the Plastun style, running on a beam with a height no less than 70 cm. At the command run 10 m, crawl in the Plastun style 10 m, run 10 m, crawl on the knees and hands 10 m, run 10 m, run on the beam 10 m, run 10 m to the finish line. Perform the task in no more than 45 seconds.

Special power endurance test. The distance is a 50-meter section of terrain, equipped with two 25-meter sections for running with a 24 kg box and place to perform squats. The task is: run 25 meters to the flag with a box weighing 24 kg (carrying the box in any way), perform 10 squats near the flag and then run 25 meters with the box in the opposite direction. Perform the task in no more than 35 seconds.

Casualty transportation. Carrying the wounded soldier on the shoulders. The distance is: 125 m section of terrain for a 100 m run, crawling for 25 m and carrying the casualty for 125 m. Start position – standing in an entrenchment 125 m away from the wounded soldier. The wounded soldier is lying on his back with a weapon. At the command get out from the entrenchment, run 100 m to the

crawling start line, crawl in a plastun style to the wounded soldier 25 m, lift him on the shoulders and carry him out at a fast pace in the reverse direction for a distance 125 meters to the entrenchment. Time to complete the test is no more than 1 minute 30 seconds.

Ammunition delivery to the firing position (for standard squad – 8 servicemen). The distance is determined by the start and turn lines, which are 30 m apart. The total distance for the exercise is 600 m. The boxes are located on both sides on the starting and turning lines, 2 boxes on each side weighing 40 kg each (the weight of the boxes may vary depending on the weight of the type of ammunition used in this unit). After the command at the same time, 4 pairs of servicemen take boxes, (2 people per 1 box), and start synchronous movement to meet each other, at an average pace. After covering 30 m, stop behind the turning line, leave the boxes and, making sure that opposite the military personnel have also left boxes on the turning line, start moving, at a fast pace, in the opposite direction (without boxes), to the starting line, take the next box (which was left by servicemen who were moving to the meeting), and repeat the transfer of boxes in the same way 9 more times. Time to complete the entire distance (20 segments) is no more than 3 minutes.

Professional Level skills assessment of military personnel was made according to the Standards for the Latest Means of Communication (Liaison Units) by the Test № 10 and Test № 69 (collective and individual).

Test № 10. Deployment of the R-414MU radio relay station (for Liaison Section). Before deployment, the station is in the initial state at a distance of 200 m from the deployment site. The task is:

— deploy hardware A1M1 and A2M1 at a distance of 100 m from each other;
— deploy each hardware unit on a telescopic antenna with one set of P-425c3 15-range;
— deploy the grounding and measure the grounding resistance;
— deploy power cables and provide power from KDE-7000 units and check supply voltages;
— establish a service connection between hardware using Grandstream IR phones;
— with the help of TK-1 sets, organize telephone communication with the deployment of an open subscriber network for 4 subscribers;
— report on implementation.

Test № 69. Radio relay station electricity providing (individual test).

— deploy grounding, install two distribution boards, lay power cables to them, accept six cables from consumers;
— check the density and level of electrolyte in two battery banks;
— check the filling of the engine with fuel, oil, water, and start it;
— connect the phone and check the service connection with the hardware.

The standards are presented in Table 1.

Table 1
Professional level skills Standards for Liaison Units

Rating	Test № 10, s	Test № 69, min
Perfect	80	14
Good	85	16
Satisfactorily	90	18

Statistical analysis. Statistical processing of the data was carried out on a computer using standard STATISTICA 7.0 programs. The data were presented as means (X) and standard deviation (SD). The normality check of the data was made in STATISTICA 7.0 programs using Distribution Fitting Module and Lilliefors test for normality. Homogeneity of variances of pre-post data was tested. The data were independent and normal. Therefore, a paired *t*-test was used for pre-post data analysis. During the study, the authenticity of the difference between pre-post data of ACTF results was determined by means of Student's criterion. The significance for all statistical tests was set at $p < 0.05$. The dynamics of ACTF results of servicemen was also estimated. Percentage change (Pre-Post Δ%) was calculated using the equation: [(Meanpost-Meanpre)/Meanpre] × 100.

For the second part of the analysis, correlation was calculated to investigate the relationships between post data results in each of the six ACFT events, the ACFT total score and Military Tasks Performance. The correlation strength was designated as follows: from 0 to 0.3 weak positive correlation, from 0.31 to 0.7 moderate positive correlation, from 0.71 to 1 strong positive correlation, from 0 to –0.3 weak negative correlation, from –0.31 to – 0.7 moderate negative correlation, from – 0.71 to – 1 strong negative correlation.

Results

According to the schedule of the experiment, military personnel were trained to perform the ACFT tasks. The progress in the mastering of the ACFT control tasks by military personnel was investigated in Pre-test – Post-test Design study. The data of the six ACFT events are shown in Table 2.

Most ACFT events showed statistically improved Post-test results except Sprint-Drag-Carry. Leg tuck results demonstrated 36.6 % increase, Push-ups – 26.4 % increase, 3-Repetition maximum deadlift – 12.7 % increase, Standing Power Throw – 7.3 % increase and 2-mile Run demonstrated 4.5 % improvement. Sprint-Drag-Carry results also improved (1.6 %) but these changes are not statistically reliable ($p>0.05$). After the unit mastered the ACFT exercises, the

proportion of servicemen who performed a score of at least 60 points on each test event or fulfilled the threshold level (passed the ACFT with a minimum total score of 360) increased by 55.1%, which is demontrated in Table 3.

Table 2
ACFT results of servicemen during the experiment (*n = 78*)

№	Test		X	SD	Pre-Post Δ%	Level of meaningfulness	
						t	p
1	3-Repetition maximum deadlift, kg	Pre	102.9	15.59	12.7	4.44	p<0.001
		Post	115.9	14.97			
2	Standing power throw, m	Pre	9.6	1.17	7.3	3.13	p<0.01
		Post	10.3	1.30			
3	Push-ups, repetitions	Pre	29.5	6.61	26.4	4.40	p<0.001
		Post	37.3	6.28			
4	Sprint-Drag-Carry, s	Pre	123	13.2	1.6	0.53	p>0.05
		Post	121	11.92			
5	Leg tuck, repetitions	Pre	8.2	5.1	36.6	3.43	p<0.01
		Post	11.2	4.8			
6	2-mile run, s	Pre	1044	88	4.5	2.33	p<0.05
		Post	1012	78			

Table 3
ACFT passing during the experiment (*n = 78*)

	Minimum total score of 360, minimum of 60 points on each event	
	Fulfill	Did not fulfill
Pre	27 (34.6 %)	51 (65.4 %)
Post	70 (89.7 %)	8 (10.3 %)

The results of the conducted experiment demonstrated the possibility of using the ACFT complex to assess the Physical Military Readiness of servicemen after its prior mastering. The results evaluation of ACFT events performance by Liaison unit's personnel is presented in Table 4.

According to the ACFT rating scale, servicemen showed better results in 3-Repetition maximum deadlift (84.89 conventional units), Standing Power Throw (83.58 conventional units) and Push-ups (83.13 conventional units) events, worse results in Leg tuck (72.28 conventional units) and Sprint-Drag-carry (74.50 conventional units) events. This fact may indicate a short term for mastering new exercises and the need for additional study of them or the expediency of improving the relevant physical abilities.

Table 4
Post-experiment evaluation of the Army Combat Fitness Test results (*n = 78*)

ACFT Task assessment	X	SD
3-Repetition maximum deadlift, kg	115.92	16.97
3-Repetition maximum deadlift, conventional units	84.89	12.43
Standing power throw, m	10.31	1.30
Standing power throw, conventional units	83.58	10.55
Push-ups, repetitions	37.30	6.28
Push-ups, conventional units	83.13	12.66
Sprint-Drag-carry, s	121.04	11.92
Sprint-Drag-carry, conventional units	74.50	7.34
Leg tuck, repetitions	11.2	4.80
Leg tuck, conventional units	72.28	30.71
2-mile Run, s	1012.12	78.03
2-mile Run, conventional units	82.54	1.46
Total ACFT scoring	481.78	40.56

The results of control Military Tasks Performance tests are presented in Table 5.

Table 5
Military Tasks Performance results (*n = 78*)

Military Tasks Performance assessment	X	SD
3 km obstacle course, s	988.91	12.69
Complex strength, speed and agility test, s	654.84	8.24
Agility test, s	42.37	3.31
Special power endurance test, s	33.58	4.52
Casualty transportation, s	87.33	7.62
Ammunition delivery to the firing position, s	173.43	8.70
Test № 10. Deployment of the R-414MU radio relay station, s	86.72	5.93
Test № 69. Radio relay station electricity providing, s	1047.45	17.84

The average means of all control exercises are within the limits of the standards for Air Force Liaison unit's personnel, which indicates a sufficient level of military and professional training of the experiment participants.

Based on the results of Post experiment ACFT evaluation, we calculated correlation to investigate the relationships between Post data results in each of the six ACFT events, ACFT total score and Military Tasks Performance – Table 6.

Table 6
Correlation between Military Tasks Performance results and Army Combat Fitness Test events (*n = 78*)

Military Tasks Performance	Army Combat Fitness Test events						
	3-Repetition maximum dead-lift	Standing power throw	Push-ups	Sprint-Drag-carry	Leg tuck	2-mile Run	Total ACFT scoring
3 km obstacle course	-0.11	**0.29***	**0.24***	0.11	0.20	0.21	**0.36***
Complex strength, speed and agility test	0.10	0.17	0.11	0.07	-0.17	0.06	0.06
Agility test	0.03	0.06	**0.33***	0.15	0.10	**0.27***	**0.29***
Special power endurance test	0.02	-0.01	**0.26***	0.18	0.09	0.17	0.22
Casualty transportation	0.03	0.13	0.20	0.20	-0.03	0.16	0.19
Ammunition delivery to the firing position	0.16	**0.34***	-0.06	**0.96***	-0.18	0.23	**0.51***
Test № 10.	0.17	0.14	**0.29***	**0.35***	0.19	0.23	**0.30***
Test № 69.	**0.34***	**0.23***	**0.38***	**0.52***	0.08	**0.31***	**0.58***

* Significantly ($p < 0.05$) correlated

The results of the study demonstrate the existence of a statistically reliable weak correlation between the following:

— Standing power throw event with 3 km obstacle course and Test № 69 Radio relay station electricity providing;
— Push-ups event with 3 km obstacle course, Special power endurance test and Test № 10 Deployment of the R-414MU radio relay station;
— 2-mile Run event with Agility test;
— Total ACFT scoring with Agility test.

The presence of a statistically reliable moderate (from 0.31 to 0.7) correlation is noted between:

— 3-Repetition maximum deadlift, Push-ups, Sprint-Drag-carry, 2-mile Run events with Test № 69 Radio relay station electricity providing;
— Standing power throw event with Ammunition delivery to the firing position;
— Push-ups event with Agility test;
— Sprint-Drag-carry event with Test № 10 Deployment of the R-414MU radio relay station;

— Total ACFT scoring with 3 km obstacle course, Ammunition delivery to the firing position, Test № 10 Deployment of the R-414MU radio relay station and Test № 69 Radio relay station electricity providing.

Sprint-Drag-carry event has a significantly strong (0.96) correlation with Ammunition delivery to the firing position test.

Discussion

This study examined the ACFT mastering progress and the relationship between ACFT events and performance of Military Tasks by Air Forces Liaison Servicemen. The ACFT has six scored events worth 100 points each that are summed to create a total score out of 600, with a minimum passing score of 60 points for each event: the 3-repetition maximum deadlift (deadlift), standing power throw, hand-release push-ups (push-ups), sprint-drag-carry, leg tuck, and 2-mile (3.22 km) run (ATP 7-22.01, 2020). According to Silvay (2020), the ACFT assesses strength, power, agility, anaerobic and aerobic capacity, which demonstrate similar neuromuscular demands that are linked to Functional Motor Competence. Stodden & Brooks (2013) contended that Functional Motor Competence means coordination and control required to perform a wide range of motor skills. It is directly linked to aspects of multiple fitness constructs through similar neuromuscular demands required in the development of various locomotor and object control skills (Stodden et al., 2009).

Taking into account the changes in the concept of the use of armed forces fighting wars in urban centers, each army requires high intensity sprints and agility-based movements in order to navigate from room to room, which demands a high level of anaerobic endurance, defined as the ability to repeatedly perform high intensity, low duration activities (Clemente-Suárez & Robles-Pérez, 2013). Additionally, in modern combat, soldiers have to carry heavier and heavier loads (Fish & Scharre, 2018), that is why the first ACFT event is deadlift (Silvey, 2020). With regard to the ACFT and Military Tasks Performance correlation analyses, it was hypothesized that the ACFT total score, the deadlift and leg tuck events would be significantly related to the Military Applied Physical Tests of the Armed Forces of Ukraine. The study did not show significant relationship between 3-Repetition maximum deadlift and leg tuck events and any of Military Applied Physical Tests. But we find significant moderate correlation between 3-Repetition maximum deadlift and individual Professional Test № 69 Radio relay station electricity providing. Total ACFT score showed statistically reliable moderate (from 0.31 to 0.7) correlation with 3 km obstacle course, Ammunition delivery to the firing position and both Professional Level tests. These results support previous research in military personnel fitness.

To assess another strength ability, the ACFT includes a measure of explosive power with the standing medicine ball throw, defined as “the amount of force a muscle can exert as quickly as possible” (Nindl et al., 2015). Power, as measured by the standing power throw, may be important for combat tasks that involve actions such as jumping, sprinting, or throwing. The study showed a week significant correlation between Standing power throw event, Ammunition delivery to the firing position and Test № 69 Radio relay station electricity providing (Table 6).

To measure the muscular endurance of a soldier, the ACFT uses Hand release push-up (Push-ups), defined as “the capacity of a muscle to repeatedly exert a submaximal force through a given range of motion or at a single point over a given time” (Knapik & East, 2014). Push-ups are a previously well-learned and familiar exercise for military personnel. A given Push-ups event result can indirectly indicate the general level of fitness of a serviceman (Knapik et al., 2009). Therefore, in our opinion, it is natural to find a weak correlation between the Push-ups event, Agility test and Test № 69 Radio relay station electricity providing. Our study confirms the opinion of scientists Withrow et al. (2023), who averred that soldiers are much more experienced with the push-up exercise, which also contributed to their performance. It is likely that servicemen averaged higher on this event over all others because push-ups have traditionally been an often-utilized exercise in the Army (Thelen & Koppenhaver, 2015). Push-ups involve upper body muscles which are not required for loading carriage and the type of movements performed in other combat tasks. That is why the study did not show any significant correlation between Push-ups and, for example, Casualty transportation or Ammunition delivery to the firing position, where lower body strength and lower body muscular endurance are critical.

According to Silvey (2020), another specific ACFT event, i.e. Sprint-Drag-Carry assesses agility (the ability to rapidly and accurately change the direction of the whole body in space) and anaerobic endurance (the ability to repeatedly perform high intensity movement for short durations). This complexly coordinated exercise is new to the majority of military personnel, so its scores are the worst among all the ACFT events. Nevertheless, Sprint-Drag-Carry showed significantly strong correlation with Ammunition delivery to the firing position test, moderate correlation with Test № 69 Radio relay station electricity providing and week correlation with Test № 10 Deployment of the R-414MU radio relay station. We have to testify the presence of Sprint-Drag-Carry event relationship to Professional skills performance.

It must be noted that in our study Leg tuck event did not show any correlation with both Military Applied Physical Tests. The present study also confirmed the opinion of Withrow at al. (2023) that the leg tuck exercises did not accurately measure trunk strength because it also required upper body strength.

According to Knapik et al. (2012) and Boffey et al. (2019), Military Tasks Performance is highly dependent on aerobic endurance. According to them, a 2-mile run provides a valid measure of aerobic capacity. We assumed to find strong correlation between the 2-mile Run event and Military Applied Physical Tests. In their study, Withrow et al. (2023) allowed military cadets not to perform well in Tactical Foot Match if they were not successful in a 2-mile Run. They noted cadets performing a 2-mile Run with a mean of approximately 17 min 35 seconds or 74 out of 100 points by the ACFT scoring standards. We achieved better results: a mean of approximately 16 min 52 seconds or nearly 82 – 83 out of 100 points by the ACFT scoring standards. Probably it is connected with the fact that we examined older and more skilled personnel. Nevertheless, in our study the 2-mile Run event showed only week correlation with Agility test and significantly moderate correlation with Test № 69 Radio relay station electricity providing (Professional level skills Standard for Liaison Units).

In general, the total ACFT scoring displayed the following: significantly week correlation with Agility test; significantly moderate correlation with 3 km obstacle course, Ammunition delivery to the firing position, Test № 10 Deployment of the R-414MU Radio relay station and Test № 69 Radio relay station electricity providing. The data obtained for the total ACFT scoring association to Military Tasks Performance confirmed the results of Palevych et al. (2021) and Withrow et al. (2023) about the validity of ACTF battery and its relationship to Military Task Performance.

Ukrainian Army facilities continue to assess the implementation of different fitness tests to ensure they are valid, fair and achieve the goal of strengthening the military personnel fitness. The previous domestic research by Oderov el al. (2020, 2022) discussed the problem of improving the Physical Military Readiness evaluating system of military personnel. According to Oderov, Romanchyk, Klymovich et al. (2017, 2022), the opinion of the majority of domestic and foreign experts on the formation of tests of physical fitness in the Armed Forces of Ukraine does not differ significantly from some provisions of the guidance documents on physical training and testing complexes of foreign armed forces. However, the main advantage of modern foreign professional armies is the ability to select the best representatives of the nation for military service (Otkydach et al. 2023). But, in Ukraine, concerning the long war period and the large number of mobilized personnel, it is impossible to ensure high quality health and fitness selection of servicemen. We believe that the formation of the Physical Military Readiness test is one of the possible ways of physical training system developed in the Armed Forces of Ukraine. Physical Military Readiness is defined as the ability to meet the physical demands of any combat or duty position, accomplish the mission, and continue to win (Gary et al., 2020). Physical Military Readiness development also indirectly promotes cardiovascular and muscular

endurance based on the activities in which these skills are consistently performed and practiced (Oderov et al., 2022). So, the ACFT is one of the most modern fitness tests for military personnel and can be implemented in the Armed Forces of Ukraine after minor modifications. Based on the results of the study and taking into account the presence of correlation, we can assert the possibility of the ACFT application to evaluate the Physical Military Readiness of servicemen.

Conclusion

The results of the conducted experiment demonstrated the possibility of the ACFT application to evaluate the Physical Military Readiness of servicemen. However, the use of the ACFT requires its prior mastering by military personnel. Almost all the ACFT events (with the exception of Leg tuck) demonstrate the presence of varying degrees of relationship with the results of Military Tasks performed by Air Forces Liaison unit's personnel. In general, the total ACFT scoring showed significantly moderate (from 0.31 to 0.7) correlation with the Performance of Military Tasks by servicemen, including Professional Standard Tests.

The prospects of further research should focus on optimizing the Physical Military Readiness evaluating process in the Armed Forces of Ukraine.

Statement of Ethics

This study was conducted in accordance with the World Medical Association Declaration of Helsinki. The study protocol was reviewed and approved by the Research Ethics Committee of General Staff of Armed Forces of Ukraine (April, 2020, Kyiv, Ukraine). All participants provided written informed consent to participate in this study

Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the research, authorship, and/or publication of the article *Army Combat Fitness Test evaluation for Air Forces Liaison Servicemen.*

Funding

The authors received no financial support for the research, authorship, and/or publication of the article *Army Combat Fitness Test evaluation for Air Forces Liaison Servicemen*.

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Viiskova kerivna detalizovana publikatsiia VKDP 7-00 (72).11.01 Nastanova z fizychnoi pidhotovky u Sukhoputnykh viiskakh Zbroinykh Syl Ukrainy, 2020 rik. [in Ukrainian]

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