

Dynamics of Cadets' Physical Fitness in the Process of Arm Wrestling

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Received October 17, 2021; Revised December 23, 2021; Accepted April 15, 2022

Cite This Paper in the following Citation Styles

(a): [1] Anatolii Rebryna, Vitalii Kytrar, Anna Koshel, Oleksii Petrovych, Tetiana Bondar, Pavlo Bosniuk, Roman Stasiuk, Volodymyr Serhiienko, Ivan Tkachenko, Oleksandr Kisiliuk, Illya Khibovych, "Dynamics of Cadets' Physical Fitness in the Process of Arm Wrestling," *International Journal of Human Movement and Sports Sciences*, Vol. 10, No. 3, pp. 361 - 370, 2022. DOI: 10.13189/saj.2022.100301.

(b): Anatolii Rebryna, Vitalii Kytrar, Anna Koshel, Oleksii Petrovych, Tetiana Bondar, Pavlo Bosniuk, Roman Stasiuk, Volodymyr Serhiienko, Ivan Tkachenko, Oleksandr Kisiliuk, Illya Khibovych (2022). *Dynamics of Cadets' Physical Fitness in the Process of Arm Wrestling*. *International Journal of Human Movement and Sports Sciences*, 10(3), 361 - 370. DOI: 10.13189/saj.2022.100301.

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Abstract The article examines the impact of arm wrestling on the level of cadets' physical fitness during their training. The research involved male cadets of the Odessa Military Academy. We formed two groups of cadets to achieve the aim of the research: the experimental (EG) and the control (CG) groups. The EG included cadets who were engaged in arm wrestling during their sporting and mass participation events at the academy (n = 36), and the CG included cadets who were engaged in sporting and mass participation events in compliance with the traditional training methods (n = 36). The level of development of strength qualities was studied according to the following tests: pull-ups on the horizontal bar, hip pull-overs on the horizontal bar, breast-ups on the horizontal bar, kettlebell jerks weighing 24 kg, dip-ups on the parallel bars, push-ups. The speed was studied

according to the results of the 100 m run, agility and coordination skills – according to the test on the obstacle course (400 m); endurance – according to the results of the 3 km run. A significantly ($p \leq 0.001$) better level of strength development in the EG cadets was revealed at the end of the experiment, compared to the CG cadets, according to the results of all strength exercises. The EG cadets also showed better indicators than the CG cadets according to the tests that characterize other motor qualities (100 m run, overcoming the obstacle course, 3 km run), but the difference was insignificant ($p > 0.05$).

Keywords Arm Wrestling, Cadets, Physical Training, Physical Fitness, Motor Skills

1. Introduction

Within the system of military specialists' training, physical training is an important pedagogical tool of training and education that accompanies officers throughout their military service [1-4]. The foundations of physical education are laid during the cadets' training in higher military educational institutions (HMEI). A large number of scientific works are devoted to the improvement of the educational process of cadets' physical education [5-9]. At the same time, the constant participation of HMEI graduates in combat operations and international peacekeeping and security activities (peacekeeping operations and missions) emphasizes the urgency of further research on the introduction of modern and effective means of physical training of cadets for future professional and combat activities.

Arm wrestling is one of the modern power sports, which has significantly developed around the world in recent years. Arm wrestling or arm wrestling is a one-handed table wrestling where participants place their elbows on the table, clasp their hands, and try to overpower each other and place the opponent's hand on the surface of the table [10-14]. Modern arm wrestling, on the one hand, is a dynamic and emotional sport, on the other is an interesting and affordable means of physical training, and its versatility allows people of all ages and genders to do it [15, 16]. Arm wrestling competitions can be effectively used to improve the moral environment of the unit, relieve stress in cadets, and organize meaningful and useful leisure time. In addition, arm wrestling is widely used as a means of sports rehabilitation, prevention of comorbidities and diseases in people with disabilities, recovery of participants in military operations [17, 18].

The relevance of our research is exacerbated by a sharp decline in the level of physical development and physical fitness of Ukrainian school graduates i. e. enrollees to HMEI, whose health is becoming critical [19-22]. Arm wrestling, which differs from other sports in its novelty, simplicity and convenience attracts young people and allows to increase the level of development of motor skills (first and foremost strength qualities) in cadets, improve physical development and strengthen their health [23, 24]. In the psychological context, arm wrestling places high demands on fostering personal qualities, development of the emotional and volitional sphere, and desire for self-actualization [25, 26]. However, the problem of developing the physical qualities of HMEI cadets by means of arm wrestling is insufficiently disclosed, which led to the choice of the research topic.

1.1. The Aim

The aim of the research is to study the impact of arm wrestling on the level of physical fitness of cadets during their training in HMEI.

2. Materials and Methods

2.1. Participants

The research, which was organized in 2017-2021, involved male cadets of the Odessa Military Academy, Faculty of Military Intelligence and Special Purpose Training, aged 18 to 23. We formed two groups of cadets to achieve the aim of the research: the experimental (EG) and the control (CG) groups. The EG included cadets who were engaged in arm wrestling during their sporting and mass participation events at the academy ($n = 36$), and the CG included cadets who were engaged in sporting and mass participation events in compliance with the traditional training methods ($n = 36$). Training sessions during sporting and mass participation events were held 3 times a week in the afternoon. The duration of each training session was 1 hour.

The experimental group was formed by questioning the 1st year cadets in the 1st semester of their training at the academy during the 1st training session on physical education, taking into account their interests and wishes. The questionnaire was developed by the author's team of this article and contained 4 questions in addition to the cadets' personal data: 1) What kind of sport and how many years did you do it before entering the academy? 2) What sports category or title do you have? 3) What are your achievements in competitions? 4) Which of the proposed sports in the academy do you want to do during sporting and mass participation events? Training sessions in the EG were conducted under the guidance of an arm wrestling coach according to the developed author's method.

The traditional method of conducting training sessions during sporting and mass participation events provided 3 training sessions per week on various topics of physical training: 1st topic – short-distance running, strength exercises; 2nd topic – long-distance running, strength exercises; 3rd topic – inspection and testing session (testing exercises that characterize speed, strength and endurance). The CG training sessions during sporting and mass participation events were conducted under the guidance of the head of the training course (unit commander).

All other forms of physical education (training sessions, morning exercise, physical training in the process of training and combat activities, self-training) of the EG and the CG cadets, as well as the method of their conduct did not differ. In general, the total number of hours for cadets' physical training in both groups was the same. The initial level of physical fitness of the EG and the CG cadets did not differ significantly ($p > 0.05$) during the first year of their training.

2.2. Methods

Research methods: theoretical analysis and generalization of literature sources, testing, pedagogical

experiment, methods of mathematical statistics.

Theoretical analysis and generalization of literature sources made it possible to clarify the current state of the research problem, to systematize and generalize information on the research topic.

Testing, as a method of scientific research, contributed to the study of the level and dynamics of cadets' physical fitness in different physical qualities. The level of development of strength qualities was studied based on the results of performing the following tests by the cadets: pull-ups on the horizontal bar, hip pull-overs on the horizontal bar, breast-ups on the horizontal bar, kettlebell jerks weighing 24 kg, dip-ups on the parallel bars, push-ups. The speed of the cadets was studied according to the results of the 100 m run, agility and coordination skills – according to the results of the general muscular endurance test on the obstacle course (400 m); endurance – according to the results of the 3 km run.

The pedagogical experiment was conducted to study the influence of arm wrestling training sessions on the level of physical fitness of cadets i. e. future officers according to the author's developed method during sporting and mass participation events. The duration of the pedagogical experiment was 4 years.

The authenticity of difference between the indicators of the cadets by means of Student's t-test was determined during the research. The dynamics of indicators in each of groups was also estimated. The significance for all statistical tests was set at $p < 0.05$. All statistical analyses were performed with the SPSS software, version 21, adapted to medical and biological researches.

2.3. Ethical Approval

This research complies with the ethical standards of the Order of the Minister of Defense of Ukraine "On Approval of the Regulation on the Organization of Scientific and Technical Activity in the Armed Forces of Ukraine" No. 385 of July 27, 2016. The procedure for organizing the research, the stages, the venue, and the permission for the involvement of cadets in the research were previously agreed with the Committee on Compliance with Academic Integrity and Ethics of the Odesa Military Academy (Protocol No. 8 of August 18, 2017). The prior consent to participate in the experiment was obtained from all the participants.

3. Results

We have developed and substantiated the author's method of developing the cadets' physical qualities during sporting and mass participation events in the process of arm wrestling. The content of the method, which was implemented mainly during the first years of training (the 1st and the 2nd years of training), included: exercises with weight of one's own body (pull-ups, breast-ups on the

horizontal bar, hip pull-overs on the horizontal bar, dip-ups on the parallel bars and push-ups, squats, jumps, multi-jumps, lifting the torso to the sitting position, maintaining static body positions, etc.). The following stages (the 3rd and the 4th years of training) of the research provided for the gradual load increase, including exercises with additional weight of objects or complicating performance conditions (e. g. pull-ups or dip-ups on the parallel bars with a disk from the barbell or dumbbell on the belt, pull-ups on the fingers, hanging on one bent arm, etc.) due to the rather rapid cadets' adaptation to exercises with the weight of their own body as a stable value of load.

The cadets used exercises with the weight of objects, overcoming the resistance of elastic objects and exercises on fitness machines in order to develop maximum strength by means of increasing muscle mass. The duration of the exercises was 20-55 s, the number of repetitions in the set was from 6-8 to 10-12 times (depending on the amount of weight), the number of sets for the development of a particular muscle group was from 2-3 to 5-6. In such a case, the duration of the concentric phase of the movement was faster than the eccentric phase. The nature of rest between sets was active (walking, exercises to restore breathing), heart rate was restored to 100-120 beats / min. We used exercises with the weight of objects, exercises on press machines and exercises to overcome the resistance of the cadets' own body weight with additional weight in order to develop their maximum strength by means of improving intermuscular coordination. The value of the load was from 30-50 % to 60-80 % of the maximum in a particular movement. The number of repetitions in one set was from 3-4 to 5-6 times, the number of sets was from 2 to 6. The nature of rest between sets was active with the duration of 1-3 minutes. We used exercises with the weight of objects, exercises on press machines and isometric (static) exercises in order to develop the cadets' maximum strength by means of improving the intramuscular coordination. The value of the load was from 85-90% to 100% of the maximum in a particular exercise. The number of repetitions in one set was from 1 to 3-4 times, the number of sets was from 2-3 to 4-5. The duration of rest between sets was planned for 2-6 minutes, the nature of rest was active. Exercises with the weight of objects, speed and strength as well as isometric exercises, exercises with combined load (one's own body weight and additional load) were used during the development of explosive strength. The value of the load was from 20-30% to 70-80% of the maximum in a particular exercise. The number of repetitions in one set was from 3-4 to 8-10 times, the number of sets was from 2-3 to 5-6. The speed of movement was from 70 to 100%, and the emphasis was on the rapid implementation of the concentric phase of the movement. The duration of rest between sets was from 1-3 to 8-10 minutes or until the restoration of heart rate to 100-120 beats / min., the nature of rest was active (walking, stretching, breathing exercises, etc.). When using isometric exercises for the development of explosive strength, it was

necessary to carry out a short-term (2-3 s) explosive effort with the affirmation to quickly reach the strain value up to 80-100% of the maximum; from 2-3 to 5-6 repetitions after 6-10 s of rest were performed in one set. The number of sets for one muscle group was 2-4. Rest interval between sets was 1.5-3 minutes, between series – 3-6 minutes; the nature of rest was active. The rest of the cadets' motor skills needed to achieve high results in daily, service and future professional activities (endurance, speed, agility, flexibility) were developed and improved during other forms of physical training at the academy (academic training sessions, morning exercise, training in the process of educational and combat activities, self-training).

The pedagogical conditions that ensure the effectiveness of the method implementation include the following: motivational and value attitude of cadets to arm wrestling training sessions during sporting and mass participation events; the level of cadets' physical fitness; the level of the teaching staff's professional skill in conducting training sessions in arm wrestling; logistical support of arm wrestling training sessions. To form the motivational and value attitude of cadets to arm wrestling training sessions during sporting and mass participation events, we conducted an introductory lesson during the 1st year of their training, which covered the basics of arm wrestling, presented the benefits of arm wrestling, its impact on the development of strength and physical development of cadets. We presented the training and sports base for arm wrestling engagement and highlighted the achievements of senior cadets and graduates in arm wrestling competitions. The material and technical support of the training sessions included tables for arm wrestling, special fitness machines for arm wrestling, exercise machines for the development of strength qualities, barbells, dumbbells, kettlebells, and other sports equipment.

We tested cadets for exercises that characterize the level of development of various physical qualities in order to check the effectiveness of arm wrestling in terms of increasing the cadets' level of physical fitness. Thus, the analysis of the results of the EG and the CG cadets in pull-ups on the horizontal bar showed that no significant

difference was detected in the results of the EG and the CG cadets during the 1st and the 2nd years of their training ($p > 0.05$). The 3rd and the 4th year EG cadets showed significantly higher results, compared to the CG cadets, by 2.6 and 3.9 times, respectively ($p \leq 0.05$; $p \leq 0.01$) (Table 1). During the experiment, the average results in both study groups significantly improved, but the difference between the indicators of the 4th and the 1st year cadets in the EG was 7.6 times ($p \leq 0.001$), and in the CG it was 3.5 times ($p \leq 0.01$). The comparative analysis of the results of the EG and the CG cadets in breast-ups on the horizontal bar showed that the indicators of the 1st and 2nd year cadets of both study groups were significantly the same ($p > 0.05$). The 3rd and the 4th year cadets who were engaged in arm wrestling during their sporting and mass participation events showed significantly better indicators than the CG cadets, by 2.1 and 2.3 times, respectively ($p \leq 0.05$) (Table 1). During the experiment, the cadets of both study groups recorded a significant ($p \leq 0.001$) improvement in the results of breast-ups on the horizontal bar: in the EG by 7.4 times, in the CG by 5.2 times. But the EG cadets showed greater rate of growth in terms of the results of this exercise performance than the CG cadets by 2.2 times, which confirms the effectiveness of arm wrestling engagement. The study of the dynamics of the cadets' results of the study groups in terms of the hip pull-overs on the horizontal bar shows that, as in the breast-ups, the average results of the EG and the CG 1st and 2nd year cadets did not differ significantly ($p > 0.05$). The senior years EG cadets showed significantly ($p \leq 0.05$) better results than the CG cadets by 2.3 times during the 3rd year of their training and by 2.8 times during the 4th year of their training (Table 1). The results of the cadets of both study groups in this strength exercise significantly improved ($p \leq 0.001$) during the pedagogical experiment, but the EG cadets of the 4th year of training showed better results compared with the results of the 1st year cadets by 7.2 times, and by 5.2 times in the CG cadets. The obtained results allow asserting the effectiveness of arm wrestling training sessions according to the developed method in terms of developing strength qualities of HMEI cadets.

Table 1. Dynamics of strength qualities development in the EG (n = 36) and the CG (n = 36) cadets in the process of the pedagogical experiment

Year of training at the academy	EG (n = 36)	CG (n = 36)	Significance of the difference	
	Mean ± SD	Mean ± SD	t	p
Pull-ups on the horizontal bar, times				
1st	12.6 ± 0.90	12.7 ± 0.88	0.08	p > 0.05
2nd	15.3 ± 0.85	13.9 ± 0.86	1.16	p > 0.05
3rd	17.9 ± 0.82	15.3 ± 0.83	2.23	p ≤ 0.05
4th	20.1 ± 0.79	16.2 ± 0.80	3.47	p ≤ 0.01
Breast-ups on the horizontal bar, times				
1st	4.8 ± 0.76	4.7 ± 0.72	0.10	p > 0.05
2nd	8.1 ± 0.79	6.8 ± 0.70	1.23	p > 0.05
3rd	10.5 ± 0.77	8.4 ± 0.68	2.04	p ≤ 0.05
4th	12.2 ± 0.72	9.9 ± 0.70	2.29	p ≤ 0.05
Hip pull-overs on the horizontal bar, times				
1st	7.2 ± 0.81	7.1 ± 0.78	0.09	p > 0.05
2nd	9.8 ± 0.79	8.7 ± 0.80	0.98	p > 0.05
3rd	12.7 ± 0.77	10.4 ± 0.79	2.08	p ≤ 0.05
4th	15.1 ± 0.75	12.3 ± 0.77	2.60	p ≤ 0.05
Kettlebell jerks weighing 24 kg, times				
1st	26.6 ± 2.21	26.4 ± 2.17	0.06	p > 0.05
2nd	32.7 ± 2.18	30.8 ± 2.20	0.61	p > 0.05
3rd	38.9 ± 2.16	34.9 ± 2.19	1.30	p > 0.05
4th	44.1 ± 2.19	37.7 ± 2.15	2.09	p ≤ 0.05
Dip-ups on the parallel bars, times				
1st	17.5 ± 1.03	17.9 ± 0.96	0.28	p > 0.05
2nd	23.2 ± 1.01	21.2 ± 0.92	1.46	p > 0.05
3rd	27.6 ± 0.98	24.5 ± 0.89	2.34	p ≤ 0.05
4th	31.9 ± 0.93	27.1 ± 0.85	3.81	p ≤ 0.01
Push-ups, times				
1st	26.7 ± 1.19	26.3 ± 1.06	0.25	p > 0.05
2nd	35.2 ± 1.17	32.9 ± 1.02	1.48	p > 0.05
3rd	43.4 ± 1.12	36.1 ± 0.97	4.93	p ≤ 0.001
4th	52.1 ± 1.10	41.5 ± 0.95	7.29	p ≤ 0.001

Note: N: number of subjects; Mean: arithmetical average; SD: standard deviation; t: t-test value, p: the significance of the difference between the indicators of the EG and the CG

The comparative analysis of the results of the EG and the CG cadets in a kettlebell jerks weighing 24 kg showed that there was no significant difference between the indicators of the 1st, the 2nd and the 3rd year cadets in both study groups (p > 0.05). The 4th year cadets who were engaged in arm wrestling according to the method developed by us showed significantly better average result in the kettlebell jerks in comparison with the CG cadets by 6.4 times (p ≤ 0.05) (Table 1). The lack of a significant difference between the indicators of the EG and the CG cadets during the 1st - 3rd years of their training is explained by the fact that exercises with kettlebells require a high level of cadets' technical training in addition to the development of their strength qualities

(including strength endurance). During the pedagogical experiment, the average results of the EG and the CG cadets in a kettlebell jerks weighing 24 kg significantly improved (p ≤ 0.001), but the EG cadets showed a greater rate of growth of results in this exercise than the CG cadets by 6.2 times. The study of the dynamics of the results of the EG and the CG cadets in dip-ups on the parallel bars allows us to note that no significant difference between the average results of the cadets was detected during the 1st and the 2nd years of their training (p > 0.05). The 3rd and the 4th year cadets of the EG revealed significantly better indicators than the CG cadets by 3.1 times (p ≤ 0.05) and 4.8 times (p ≤ 0.01), respectively (Table 1). The cadets of both groups showed

significant improvement in the results of dip-ups on the parallel bars ($p \leq 0.001$) during the pedagogical experiment: in the EG – by 14.4 times, in the CG – by 9.2 times. However, the rate of growth in the results of the EG cadets was greater than in the CG cadets by 5.2 times. This allows us to arrive at conclusions about the advantage of training sessions in arm wrestling according to the developed method during sporting and mass participation events, compared with the training sessions according to the traditional method of sporting and mass participation events at the academy. The comparative analysis of the results of the EG and the CG cadets in push-ups showed no significant difference, like in most previous strength exercises, between the average results of the EG and the CG cadets during the 1st and the 2nd years of their training ($p > 0.05$). The results of 3rd and the 4th year cadets in the EG were significantly ($p \leq 0.001$) higher than in the CG cadets by 7.3 and 10.6 times, respectively (Table 1). The cadets of both study groups significantly improved their results in this exercise ($p \leq 0.001$) during the pedagogical experiment, but a significantly higher rate of growth was found in the EG cadets, which confirms the positive effect of the training according to the developed method. Thus, the studies of the dynamics of the strength qualities development in the EG and the CG cadets showed a positive impact of arm wrestling on the cadets' strength capabilities according to

the developed method during sporting and mass participation events.

The comparative analysis of the dynamics of speed development in the EG and the CG cadets showed that, starting from the 3rd year of training, the EG cadets revealed better results in the 100 m run than the CG cadets, but no significant difference was detected between the average results of the EG and the CG cadets during all their training years ($p > 0.05$) (Table 2). The results of the 100 m run significantly improved in both study groups during the experiment: in the EG – by 0.8 s ($p \leq 0.001$), and in the CG – by 0.6 s; however, a larger rate of growth was found in the EG cadets. The analysis of the results of the EG and the CG cadets in overcoming the obstacle course showed that, despite the fact that the EG cadets have better average results during the 2nd, the 3rd and the 4th years of their training than the CG cadets, but the indicators of military applied skills during all training years did not differ significantly ($p > 0.05$) (Table 2). The cadets of both study groups had a significant ($p \leq 0.001$) improvement in the average results in overcoming the obstacle course during the pedagogical experiment: in the EG – by 14.7 s, in the CG – by 11.6 s. At the same time, a greater rate of growth in the results was found in the EG cadets, which allows us to say that arm wrestling training sessions according to the developed method contribute to the cadets' mastery of military-applied motor skills.

Table 2. Dynamics of speed, endurance and military-applied motor skills development in the EG (n = 36) and CG (n = 36) cadets in the process of the pedagogical experiment

Year of training at the academy	EG (n = 36)	CG (n = 36)	Significance of the difference	
	Mean ± SD	Mean ± SD	t	p
100 m run, s				
1st	14.3 ± 0.16	14.2 ± 0.15	0.46	p > 0.05
2nd	14.1 ± 0.15	14.1 ± 0.14	0.00	p > 0.05
3rd	13.7 ± 0.14	13.8 ± 0.14	0.51	p > 0.05
4th	13.5 ± 0.12	13.6 ± 0.13	0.57	p > 0.05
General muscular endurance test on the obstacle course, s				
1st	134.9 ± 1.67	135.1 ± 1.58	0.09	p > 0.05
2nd	130.2 ± 1.64	132.3 ± 1.55	0.93	p > 0.05
3rd	126.1 ± 1.61	127.6 ± 1.53	0.68	p > 0.05
4th	120.2 ± 1.60	123.5 ± 1.49	1.51	p > 0.05
3 km run, s				
1st	769.5 ± 9.91	770.1 ± 9.55	0.04	p > 0.05
2nd	755.3 ± 9.85	756.4 ± 9.52	0.08	p > 0.05
3rd	740.8 ± 9.80	743.2 ± 9.48	0.18	p > 0.05
4th	722.5 ± 9.76	725.6 ± 9.45	0.23	p > 0.05

Note: N: number of subjects; Mean: arithmetical average; SD: standard deviation; t: t-test value, p: the significance of the difference between the indicators of the EG and the CG

The comparative analysis of the results of the 3 km run in the EG and the CG cadets showed that the EG cadets of the 2nd, the 3rd and the 4th years of training have a better level of endurance development than the CG cadets, but no significant difference was found between them ($p > 0.05$). A significant improvement in the results of the 3 km run took place in the process of the cadets' training period in both groups ($p \leq 0.01$), but the EG cadets showed a greater rate of growth in the level of endurance development than the CG cadets by 2.5 s (Table 2).

Thus, the comparative analysis of the dynamics of speed, agility and endurance development in the EG and the CG cadets showed that the EG cadets revealed better results in terms of all these motor qualities at the end of the pedagogical experiment, but the difference between the EG and the CG cadets was insignificant. This suggests that arm wrestling training sessions according to the developed method contribute to the development and maintenance of a high level of cadets' physical fitness. This, in turn, will ensure high efficiency of the tasks of their future professional and combat activities.

4. Discussion

Physical training in HMEI promotes formation of physical fitness of future officers for acquiring weapons and military equipment handling as well as their effective use, for overcoming physical loads, nervous and mental stresses in extreme situations; solving problems of training and education of cadets and uniting military teams; accumulating experience in the application of acquired values throughout life in personal, educational, and daily service activities, everyday family and vital activities; increasing the importance of exercise in activities of daily living [27-29]. Sporting and mass participation events are one of the main forms of physical training of cadets, which successfully combines the developmental function, in particular, helps to increase the level of cadets' physical fitness, and educational – provides an opportunity to organize leisure time of the personnel [30, 31]. A more prepared personality of a cadet in matters of a healthy lifestyle and sports training is formed due to their participation in sporting and mass participation events. The participation of cadets in sporting and mass participation events provides them with a positive experience that they can successfully use in their future professional activities and share it with their subordinates in the future. Sporting and mass participation events are an effective means of educating cadets desire to victory and resilience in conditions of increased physical activities and mental stress [32, 33]. It was found that arm wrestling as a means of developing cadets' physical qualities (and strength qualities in particular) is the least studied among a large number of modern military-applied sports and physical exercises, which are highly popular among cadets of HMEI.

Arm wrestling attracts the possibility of a multifaceted impact on the functional capabilities of the body of those involved. Thus, according to the scientists [34-36], the activity of the cardiovascular and respiratory systems is activated, muscles are strengthened, physical performance is increased, and physical fitness is improved in the process of muscle-strengthening exercises. Our research confirms the findings of many scientists [37-43] on the positive impact of strength sports, including arm wrestling on the level and dynamics of cadets' physical fitness during their sporting and mass participation events.

5. Conclusions

- (1) The author's method of cadets' physical qualities development during arm wrestling was developed and substantiated. The developed method was implemented during such form of physical education as training sessions in the course of sporting and mass participation events, which were conducted in accordance with the daily routine of the academy 3 times a week. The means were represented in the form of strength orientation exercises for development of the maximum strength, speed strength, explosive strength and strength endurance. Each stage of the method realization offered their rational balance. The content of the method, which was implemented mainly during the first years of training, included: exercises with weight of one's own body. The load was gradually increased during the senior years of training and included exercises with additional weight of objects or complicating the conditions of performance.
- (2) The positive influence of arm wrestling, compared to the traditional training methods in terms of increase of the level of cadets' physical fitness was revealed. A significantly ($p \leq 0.001$) better level of strength development in the EG cadets was revealed at the end of the pedagogical experiment, compared to the CG cadets, according to the results of pull-ups, breast-ups, hip pull-overs, dip-ups on the parallel bars and push-ups. The EG cadets also showed better indicators than the CG cadets according to the tests that characterize other motor qualities (100 m run, overcoming the obstacle course, 3 km run), but the difference was insignificant ($p > 0.05$).
- (3) A high level of cadets' physical fitness will help improve the effectiveness of their future professional and combat activities.

Disclosure Statement

No author has any financial interest or received any financial benefit from this research.

Conflict of Interest

The authors state no conflict of interest.

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