

Factors that determine the necessity for developing skills required by cadets in higher education institutions of the Aerospace Forces to organize their kettlebell self-training

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Abstract:

This article substantiates the factors that determine the necessity to develop skills required by cadets of higher education institutions of the Aerospace Forces to organize and conduct their self-training with kettlebells. They include a considerable limitation of opportunities for regular physical training of graduates during combat tasks fulfillment, and also frequent missions against international terrorism. The important factors are limited opportunities for regular physical training during combat tasks fulfillment; low level of cadets' skills of organizing self-training with kettlebells; lack of knowledge among cadets about its organizing and realization. The authors draw attention to cadets' insufficient skills of choosing means for self-training with kettlebells for maintaining high efficiency, to poor knowledge of self-training with kettlebells techniques, and also to cadets' insufficient skills of correct estimating their individual abilities while planning self-training with kettlebells.

Keywords: factors; cadets of higher education institutions of the Aerospace Forces; methods for skill-developing; self-organized kettlebell training; combat task fulfillment; international terrorism.

Introduction

Modern conditions of conducting warfare against terrorists in Syria and new threats on the part of ISIS (DAESH) and other terrorist organizations towards Russia and other countries require reorganization of PE classes with graduates of higher education institutions of the Aerospace Forces. [14]. Graduates of Aerospace Forces academies are entrusted with serious tasks to liquidate ISIS (DAESH) terrorists on the territory of Syria. In terms of using force, numerous operations to eliminate militants are conducted, which requires considerable mental, physical, and psychological endurance. [1,2,4,5,6,7,9]. The success of combatant operations is in many respects determined by the physical readiness of graduates at higher education institutions of the Aerospace Forces. [12,14]. The physical readiness of graduates at higher education institutions of the Aerospace Forces must satisfy the requirements, determined by modern characteristics of conducting warfare against ISIS (DAESH) militants. [14]. What is very important during such operations is timeliness and reliability of warfare, high efficiency level, stamina and endurance. The above-stated requires special physical training of graduates at higher education institutions of the Aerospace Forces, which is directed to self-maintaining high efficiency and endurance. Under such conditions the main form of physical training of graduates of Aerospace Forces academies is self-training. [14]. In these circumstances, the goal of physical training in Aerospace Forces institutions changes. The goal of physical training in Aerospace Forces higher education institutions is connected with developing skills of self-organized training with kettlebells among cadets. The main direction of physical training in Aerospace Forces higher education institutions must become developing skills of organizing self-training with kettlebells among cadets. [3,5,6,8, 9,11,12,14].

The military efficiency and endurance level of graduates at higher education institutions of the Aerospace Forces must satisfy the requirements, determined by modern characteristics of combat task fulfillment. During combat tasks it is very important to show speed and accuracy of movements, promptitude and reliability of officers' actions, high concentration under fatigue. Under such conditions the main type of physical training for Aerospace Forces officers is training aimed at maintaining high efficiency and endurance level. A number of studies showed that an important role in such a training should be played by kettlebell exercises. [8-13].

The primary guiding line of physical training for cadets of higher education institutions of the Aerospace Forces must be developing skills of self-training with kettlebells to maintain high efficiency and endurance level. Moreover, the military practice study discovered insufficient readiness for the methodologically correct use of kettlebell exercises by graduates of Aerospace Forces higher education institutions. The typical mistakes of graduates' training in Aerospace Forces higher education institutions is their low methodological

preparedness for self-training with kettlebells to maintain high efficiency and endurance level. It adversely affects their efficiency during fulfilling combat tasks.

All the stated above indicates that the search of new better ways of self-training with kettlebells is needed to enhance cadets' methodological preparedness to maintain high efficiency and endurance level during physical training in Aerospace Forces higher education institutions.. The search of new better ways is needed to improve cadets' physical readiness to perform combat tasks. The search must be based on the application of self-training skills. Today educational specialists, studying the problems of physical training for cadets of Aerospace Forces higher education institutions, are not in agreement with each other in respect of forming self-training skills among cadets, and also in respect of choosing goals, means, and techniques of education while developing these skills. [14]. Moreover, training load regulations have not been fully studied. [10,11].

Materials and methods

In modern conditions, requirements for training graduates of Aerospace Forces higher education institutions are toughened. Without high-quality and purposeful cadet training in Aerospace Forces higher education institutions, it is impossible to fulfill such primary tasks. That is why the detection of indices, which indicate high readiness of graduates at higher education institutions of the Aerospace Forces for combat tasks fulfillment, is an important educational problem. Nowadays, modern military equipment of the Aerospace Forces has radically changed the conditions of military specialists' work. It is known, that for graduates of Aerospace Forces academies this work has acquired features of operator's activity, connected with receiving and processing information, making decisions based on it, and eliminating ground and air forces of the enemy. Intellectual, psychological, and emotional stress is inherent in the activity of graduates of Aerospace Forces higher education institutions, but what they virtually miss is muscle activity. This leads to weakening their muscular system and tonus, and also lowering their military efficiency. A big role in estimating combat skills of graduates at higher education institutions of the Aerospace Forces belongs to their military preparedness and efficiency. During combat tasks, many factors which prevent their fulfillment are taken into account. These factors include low efficiency level, low psychological resistance, low stamina and endurance. In addition, certain aspects of cadets' physical training to improve efficiency and endurance need scientific justification. In many respects it concerns contents, organization, and methods of specific physical training with kettlebells among cadets of Aerospace Forces higher education institutions .

Studying at higher education institutions of the Aerospace Forces is the main way to prepare cadets for combat tasks. During the training, they acquire military experience and form attitude towards combat tasks. Cadets' activity during their studies is educational. Therefore, the training efficiency is in many respects determined by professors' ability to organize academic activities according to the basic regularities of education. The training process in higher education institutions of the Aerospace Forces is complex and diversified. Essential here are planning, goals, class organization, their material support, and training of instructors and cadets. Nevertheless, it has long been observed, that successful training depends on methods – an ordered system of techniques and means which are used in a certain logical sequence, connection, and mutual conditionality. Therefore mastering educational methods by professors is one of the main tendency in improving preparedness of graduates at higher education institutions of the Aerospace Forces for combat duty. Educational methods characterize the system of techniques and means with which knowledge is imparted and acquired, and skills needed for the combat duty are developed. Still, the main focus must be on building stable skills for efficient fulfillment of combat tasks by cadets. Thus, a competent and logic structure of education in higher education institutions of the Aerospace Forces is determined by knowledge of indicators which show high readiness of cadets for the combat duty.

Results and their discussion

Analyzing the survey for specialists, and the correlation between combat task fulfillment efficiency and the main indicators of readiness for combat task fulfillment of graduates of Aerospace Forces academies, we defined the rank structure of correlation dependence of warfare efficiency on these indicators (table 1).

Table 1. The analysis of correlation dependence of different indicators of readiness for combat tasks and efficiency of their fulfillment by graduates of Aerospace Forces academies

| Rank | Indicators of readiness for combat tasks | Efficiency of combat task fulfillment |
|------|---|---------------------------------------|
| 1 | High level of expertise and skills of combat task fulfillment | +0.83 |
| 2 | High level of military efficiency during combat task fulfillment | +0.79 |
| 3 | High level of emotional readiness of graduates for combat tasks | +0.67 |
| 4 | Having experience of combat duty and combat task fulfillment | +0.58 |
| 5 | High physical readiness for combat task fulfillment | +0.49 |
| 6 | Solidarity and coordination skills of personnel on duty | +0.42 |
| 7 | High efficiency of personnel-on-duty control during combat task fulfillment | +0.39 |
| 8 | High morale level of graduates of Aerospace Forces academies | +0.27 |

The research showed that the main indicators are high level of expertise, combat task fulfillment skills, and military efficiency. This could also include emotional readiness of graduates for combat tasks and combat duty experience. What also matters is high physical readiness for combat task fulfillment, solidarity, and coordination skills of personnel on duty.

The least important indicators are high efficiency of personnel-on-duty control during the combat task fulfillment and also high morale level of graduates of Aerospace Forces academies. The discovered indicators of readiness of graduates of Aerospace Forces academies for combat tasks give an opportunity to optimize the direction of education.

The specific character of combat task fulfillment is defined by critical emotional stress. This stress depends on combat performance speed, the amount of military work, and efficiency and endurance level.

Military activity during the combat task fulfillment is characterized by uneven distribution of time for military work; physical inactivity and monotony during military work; limited conditions for physical training.

The above-mentioned negatively affects fitness and efficiency of graduates at higher education institutions of the Aerospace Forces. During the combat task fulfillment, graduates of Aerospace Forces institutions must be able to join in the military work at any moment. Moreover, they have to perform at the peak of morale and courage. The practice shows that without high efficiency and endurance level it is impossible to maintain efficient combat task fulfillment. This problem can be solved with kettlebell exercises, because these exercises require no special conditions and they are simple to do. Graduates of Aerospace Forces higher education institutions can do workouts being on their combat duty. In this context, choosing the training technique is determined by training goals, preparedness, and conditions under which the training takes place. However, in the course of research it was discovered that problems of skill-developing for self-training among cadets are not solved in a unified system of physical training. Physical Education professors have no common understanding of the necessity to build such skills. In order to overcome this contradiction, we carried out a survey for Aerospace Forces officers. Overall, 114 respondents took part in the research. In the course of the research we discovered factors, which determine the necessity to develop skills of self-training among cadets at higher education institutions of the Aerospace Forces. The results of this research are shown in table 2.

This research discovered factors, which determine the necessity to develop skills of self-training among cadets at higher education institutions of the Aerospace Forces. The factors include a considerable limitation of opportunities for regular physical training with graduates during the combat task fulfillment and also frequent missions against international terrorism. Important factors are limited opportunities for regular physical training on combat duty; low level of cadets' skills of organizing self-training; insufficient cadets' knowledge of its organization. The respondents draw attention to the lack of cadets' skills in choosing means of self-training to maintain high efficiency and endurance level, to poor knowledge of self-training techniques, and to insufficient cadets' skills of correct estimating their individual abilities while planning self-training.

Table 2. Rank structure of factors that determine the necessity to develop skills of organizing self-training among cadets at higher education institutions of the Aerospace Forces (n=114)

| Significance (rank) | Factors | Rank index % |
|---------------------|--|--------------|
| 1 | A considerable limitation of opportunities for regular physical training with graduates during the combat task fulfillment | 19.9 |
| 2 | Frequent missions against international terrorism | 18.7 |
| 3 | Limited opportunities for regular physical training on combat duty | 15.3 |
| 4 | Low level of cadets' skills of organizing self-training | 13.2 |
| 5 | Insufficient cadets' knowledge of organizing self-training | 11.8 |
| 6 | Lack of cadets' skills in choosing means of self-training to maintain high efficiency and endurance level | 9.7 |
| 7 | Poor knowledge of self-training techniques to maintain high efficiency and endurance level | 6.3 |
| 8 | Insufficient cadets' skills of correct estimating their individual abilities while planning self-training | 5.1 |

The changes in character and content of military activity of graduates at higher education institutions of the Aerospace Forces make high demands on their power of movement, adaptation capabilities, and efficiency level. The above-stated determines the necessity for the purposeful use of kettlebell exercises to eliminate a negative influence of combat duty conditions on soldiers' health and to maintain their efficiency.

In this connection, kettlebell exercises, which can improve functionality and efficiency of graduates of Aerospace Forces higher education institutions, become more important. According to many authors, kettlebell exercises are one of the major means to improve efficiency. Therefore developing methods of kettlebell exercises use for optimizing physical regime and efficiency of graduates at higher education institutions of the Aerospace Forces is an important scientific problem. The fundamental research revealed the main patterns of training with kettlebells. Studying common notions about physical training of cadets of the Aerospace Forces academies using kettlebell exercises, it should be noted that the training goal has its own peculiarities. It is

known that the goal of kettlebell training is to achieve high athletic performance. Meanwhile, the goal of using kettlebell exercises in physical training of cadets is the perfect adaptation of their organism functions to intense academic work. These exercises must be aimed at maintaining mental capacity, taking precautions against negative factors of military work, and improving mental health of cadets of Aerospace Forces higher education institutions. Besides, self-training skills were formed with the help of organizing training with kettlebells.

The research done on the problems of improving physical training of cadets of Aerospace Forces academies shows that much attention was drawn to determining efficient regimes of physical activity. Moreover, we have not found any research works on an optimal approach to physical training with kettlebells among cadets of Aerospace Forces academies. It is known that purposeful training with kettlebells may affect different efficiency indicators of cadets at higher education institutions of the Aerospace Forces. It is one of the major factors, which determines the necessity of using kettlebell exercises to improve cadets' efficiency and endurance.

The practice indicates poor efficiency of using kettlebell exercises in a current physical training system to maintain soldiers' efficiency. According to the majority of specialists, the main reasons lie in the insufficient development of guidelines for using kettlebell exercises to maintain soldiers' efficiency. Preliminary research has shown that developing such guidelines will allow improving the quality of soldiers' physical training.

Many scholars note that combat task fulfillment is connected with the influence of a considerable number of negative factors in the military work. It leads to increasing different diseases among graduates of Aerospace Forces academies. The practice showed that the negative influence could be compensated by using kettlebell exercises, developing skills of organizing self-training with kettlebells, and implementing scientifically grounded training methods into the educational practice of cadets of higher education institutions of the Aerospace Forces.

Nowadays it should be noted that lacking attention is paid to substantiating relevant problems of physical training with kettlebell theory and organization among cadets of Aerospace Forces institutions. It is known that the professional efficiency of graduates of Aerospace Forces higher education institutions is an important aspect of maintaining combat readiness of troops.

A more detailed study of the military work regime of graduates of Aerospace Forces academies showed that opportunities of physical training to maintain efficiency, especially on combat duty, are very limited. The stated reasons complicate physical training, except for kettlebell exercises. Moreover, using kettlebell exercises does not require special conditions. The research showed that regular physical training with kettlebells determines forming the necessity for systematic daily training of cadets at higher education institutions of the Aerospace Forces, cultivates diligence and discipline needed for studying. Functional organism changes of cadets lead to the desire of constant self-improving. Physical training becomes an internally necessary factor in the daily life of cadets of Aerospace Forces academies. Thus, a great attention should be paid to implementing the principle of systematic character in physical training organization for cadets of higher education institutions of the Aerospace Forces.

Military and academic work of cadets of Aerospace Forces higher education institutions is regulated by proper directive documents. Physical training is a part of military training of cadets in Aerospace Forces higher education institutions. Problems of improving the military and academic efficiency of cadets are solved during physical training. Physical training with kettlebell exercises for cadets has the following forms: morning exercises, learning sessions, training sessions, and sporting competitions.

The practice shows that using kettlebell exercises in physical training of cadets ensures high quality of the educational process in higher education institutions of the Aerospace Forces universities, which leads to improving their efficiency. Using kettlebell exercises helps to improve organism functionalities of cadets and facilitates developing major military skills, needed for combat activity. It benefits cadets' efficiency and makes it easier to acquire a military profession.

Solving the above-listed problems is closely connected with discovering factors that determine the necessity of using kettlebell exercises in physical training of cadets of the Aerospace Forces higher education institutions. In order to determine the rank structure of these factors a survey was carried out for 38 weightlifting trainers and for professors of Aerospace Forces higher education institutions who have been working in physical training and sports departments for more than 10 years. The results of this survey are shown in the table 3.

The generalized results in the form of a survey allowed concluding that one of the main factors of successful military work of graduates of Aerospace Forces academies is their high efficiency.

The analysis of cadets' physical activity enables determining the necessary level of self-dependence while doing kettlebell exercises. In addition, the study of cadets' motivation and its pattern, which induce and stipulate their attitude towards self-training with kettlebells, allows determining particular ways of their involvement into regular training, and allows performing the training's optimal individualization based on training load regulation.

Table 3. Rank structure of factors that determine the necessity to use kettlebell exercises if physical training of cadets of higher education institutions of the Aerospace Forces (n=38)

| Factors | Rank index (%) | Rank position (importance) |
|---|----------------|----------------------------|
| The necessity to improve academic efficiency of cadets in the course of studying at university | 19.7 | 1 |
| Simplicity and accessibility of using kettlebell exercises | 17.2 | 2 |
| Low level of cadets' physical preparedness | 15.3 | 3 |
| The necessity to develop speed/strength abilities and endurance of cadets | 13.1 | 4 |
| The necessity to develop skills of organizing self-training with kettlebells among cadets | 11.9 | 5 |
| High effectiveness of using kettlebell exercises to maintain efficiency in the course of combat duty after graduation | 9.7 | 6 |
| The possibility to use an anaerobic mode of supplying energy for muscle activity during kettlebell exercises | 7.8 | 7 |
| The necessity to take into account cadets' sports interests and preferences | 5.3 | 8 |

We engaged 127 cadets of Mozhaysky Military Space Academy in studying physical activity. In order to determine cadets' physical activity, their commitment to training with kettlebells was studied in terms of systematic character and stability of training, range of using different means and forms of physical training, and training duration. As a result, all the sample of subjects was divided into 4 typological groups.

21.3% of the respondents, who showed high level of commitment to training with kettlebells, were put into group "A".

Group "B" was formed by 28.3% of the respondents who showed the average level of commitment to training with kettlebells.

Group "C" included 34.6% of the cadets, characterized by a low level of commitment to training with kettlebells.

Those cadets (15.7%), who, according to the survey, haven't been training with kettlebells for a long time, were put into group "D".

In each typological group, the level of cadets' physical activity for using kettlebell exercises was discovered. Cadets' physical activity is subjectively stipulated by the level of their needs of physical improvement as the main causes of using kettlebell exercises (table 4).

The results of the survey show that the main psycho-pedagogical conditions needed for improving efficiency of cadets of Aerospace Forces academies with the help of kettlebell exercises are their systematic use in all forms of physical training and also forming motivation and interest of cadets in their regular use.

Table 4. The needs of using kettlebell exercises among cadets of different physical activity groups (in %)

| № | Needs | Typological group | | | Position according to importance |
|----|---|-------------------|------|------|----------------------------------|
| | | "A" | "B" | "C" | |
| 1. | Physical improvement | 42.2 | 33.8 | 12.4 | 4 |
| 2. | Health improvement | 94.8 | 81.3 | 59.6 | 2 |
| 3. | Developing strength and endurance | 39.7 | 32.8 | 24.4 | 3 |
| 4. | Improving and maintaining efficiency | 87.3 | 39.5 | 33.3 | 1 |
| 5. | Physical rehabilitation after exams | 62.0 | 28.2 | 12.4 | 7 |
| 6. | Removing emotional stress | 76.1 | 27.9 | 29.0 | 6 |
| 7. | Improving movement skills and abilities | 12.2 | 3.3 | 2.1 | 5 |
| 8. | Psychological comfort | 79.7 | 26.9 | 14.6 | 8 |

According to the data in table 4, it is seen that group "A" representatives have a wide range of needs that reflects the need of physical and mental improvement directed to improving academic efficiency. For groups "B" and "C" representatives the main needs are health improvement, positive emotions, and developing strength and endurance.

A particular interest is aroused by cadets' motivation to self-training with kettlebells immediately after learning sessions. Self-training with kettlebells for cadets of groups "A" and "B" matters most in respect of maintaining proper academic and military efficiency and of securing the optimal mental state; for cadets of group "C" it is in respect of health improvement (fig. 1).

1 – developing strength and strength endurance; 2 – improving and maintaining efficiency; 3 – securing psychological comfort

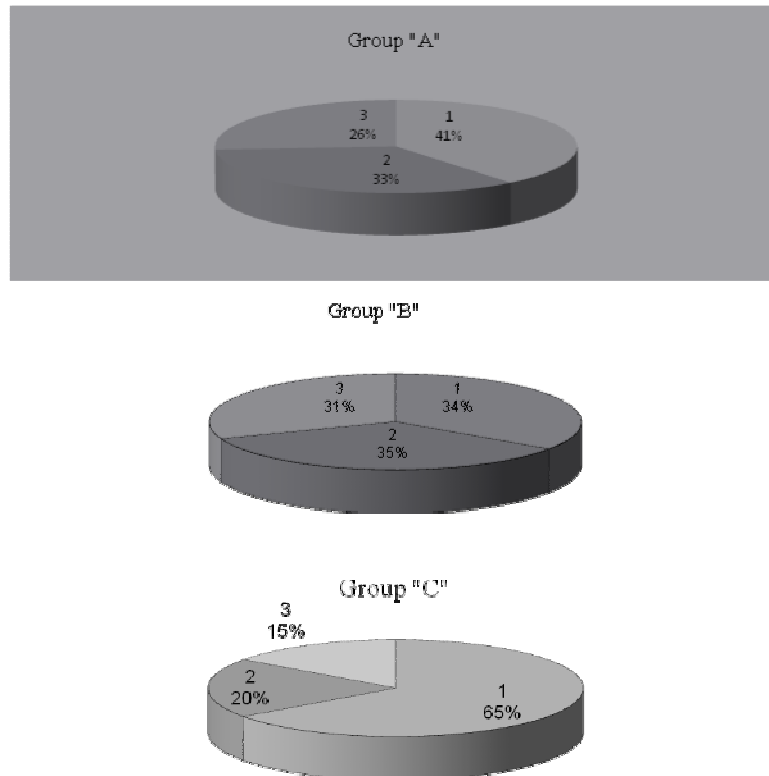


Fig. 1. Value-motivational orientation structure of cadets for organizing self-training with kettlebells

According to this data, the representatives of the first two groups have more mature motives for self-training with kettlebells.

Subjective motives in the cadets from group "C", although ultimately they also give an opportunity to improve cadets' physical preparedness and efficiency.

The cadets who are not physically active in their everyday life found difficulty in choosing and estimating any effects from self-training with kettlebells. We discovered that the basis of passive attitude of a considerable part of the cadets towards self-training with kettlebells is a set of subjective and objective motives.

The former include, as shown above, negative motives to physical-sport activity in general and to kettlebell training in particular and also weakened health (34.5%). The latter include neglect to kettlebell training (33.9%) and also a poor state of sports equipment (31.6%).

We have carried out the analysis of motivational aspects of self-training with kettlebells, which indicates that high profile of physical training with kettlebells to improve and maintain academic efficiency is only realized by 40-45% of the respondents. The level of cadets' commitment to self-training with kettlebells is regulated by a set of their physical needs and interests.

In the course of the research it has been found that the necessary condition is to develop skills of organizing self-training of cadets with kettlebells. Such a skill will let the cadets implement their plans connected with physical improvement and improvement of not only their academic efficiency in university, but also in their further military service after graduation.

Conclusion

The discovered factors indicate the necessity to develop skills of organizing self-training for cadets of higher education institutions of the Aerospace Forces during their studies. This will allow a significant improvement of graduates' physical readiness to combat tasks against international terrorism.

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