

DOI 10.31392/UDU-nc.series15.2023.11(171).01  
УДК:796.015.1

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#### THE EFFICIENCY OF APPLICATION OF THE "TABATA" SYSTEM IN THE PROCESS OF STRENGTH TRAINING OF CADETS OF HIGHER EDUCATION INSTITUTIONS WITH SPECIFIC LEARNING CONDITIONS

Тьорло О.І., Шутка Г.І., Червоношапка М.О., Кмицяк М.В., Голубева О.Т., Сопіла Ю.М., Мазур Т.Р. Ефективність застосування системи "Табата" у процесі силової підготовки курсантів закладів вищої освіти зі специфічними умовами навчання. Важливим завданням підготовки здобувачів у ЗВО зі специфічними умовами навчання в умовах воєнного стану є формування готовності до застосування заходів фізичного впливу як за звичних умов службової діяльності, так і в умовах ускладнення оперативної обстановки. Важливим компонентом у структурі фізичної підготовленості курсантів є високий рівень силових здібностей, які значною мірою впливають на ефективність діяльності правоохоронців у екстремальних ситуаціях. У процесі підготовки здобувачів у ЗВО зі специфічними умовами навчання актуальним є вибір та застосування найбільш ефективних засобів та методів силової підготовки. Метою роботи була перевірка ефективності тренувань за системою Табата у процесі вдосконалення силових здібностей курсантів ЗВО зі специфічними умовами навчання.

**Ключові слова:** заклади вищої освіти, курсанти, правоохоронна діяльність, фізична підготовка, силові здібності, "Табата".

**Torlo Olena, Shutka Halyna, Chervonoshapka Maryna, Kmytsiak Mykola, Golubeva Olena, Sopila Yulia, Mazur Taras.** *The efficiency of application of the Tabata system in the process of force training of cadets of higher education institutions with specific learning conditions. An important component in the structure of the overall physical fitness of cadets is a high level of strength abilities, which greatly affect the effectiveness of activities in extreme situations. The choice and application of the most effective means and methods of force training is relevant in the process of training applicants in institutions of higher education with specific learning conditions. The purpose of the work was to study the indicators of the development of strength abilities of cadets under the influence of classes on the traditional program of "Special Physical Training" and under the influence of training on the Tabata system. In the process of work, a pedagogical experiment was conducted. The control and experimental groups included cadets (men) of the second year of study, applicants for the educational degree "bachelor" in the specialty "Law enforcement activity". Indicators of the development of strength abilities were researched by tests: complex strength exercise, pull-ups on the crossbar, squats in 20 s, jump up from the place, flexion and extension of the arms in the stop lying in 20 s. The results of the pedagogical experiment showed, that the use of the traditional method of motor abilities development, as well as the use of training according to the Tabat system, allows achieving reliable positive changes in the indicators of power preparedness of applicants for higher education. At the same time, the implementation of exercise complexes according to the Tabata protocol allows achieving a more pronounced improvement.*

**Key words:** higher education institutions, cadets, law enforcement activity, physical training, power abilities, "Tabata".

**Formulation of the problem.** One of the important tasks of the process of training future law enforcement officers in higher education institutions with specific learning conditions under martial law is the formation of a high level of readiness for the use of measures of physical influence and special means both under the usual conditions of law enforcement activity and in conditions of complication of the operational situation (various phenomena of social, natural, technogenic nature) [13, 14].

An important component in the structure of the overall physical fitness of cadets is a high level of strength abilities that significantly affect the effectiveness of law enforcement officers activity, in particular, the effectiveness of the application of measures of physical influence in extreme situations of official activity [15, 16].

The results of our preliminary studies [12] showed that the most pronounced increase in the level of strength training of cadets is observed during the first year of study. In the future, there is a slowdown in the rate of improvement and stabilization of the level of force preparedness. An obvious reserve for optimizing the process of force training of cadets is the search and application of the most effective means and methods of force training, which would ensure the proper dynamics of the level of development of force abilities of applicants at all stages of the training process.

The analysis of scientific and methodological sources has shown that the attention of scientists has recently been caused by the use of high-intensity interval training in the Tabata system in the process of developing the motor abilities of applicants for higher education. The high efficiency of this system is due to the fact that it creates a significant load on both aerobic and anaerobic mechanisms of energy supply, and therefore contributes to increasing their productivity [10, 11].

**Analysis of literary sources.** A number of scientific studies have been conducted aimed at testing the effectiveness of Tabata system training in the field of physical education and sports.

The analysis of scientific and methodological works showed that high-intensity interval training, proposed by Izumi Tabata, allows for a short period of time to increase both aerobic and anaerobic abilities of the body and purposefully develop endurance in the process of practical training with students [6]. The authors recommend using this method in training sessions for trained students 2-4 times a week, for students with a low level of preparedness 1-2 times a week, alternating with other types of classes to increase interest in physical education and sports activities.

The effectiveness of the Tabata technique in physical education classes with low intensity and exercises selected in accordance with the preparedness of future design specialists has been proved [3].

In addition to the positive impact on the development of motor skills, experts note that the use of the Tabata technique during physical education classes with students has a positive effect on improving the attitude of students to physical culture and recreational activities; formation of sustained interest in physical education; increasing the level of confidence in one's abilities; improving the state of attending classes by applicants for higher education; activation of physical culture and recreational work with students [2].

Research has established that the implementation of the method of interval training according to the "Tabata" system as part of the physical education of students of non-physical education institutions of higher education has a positive effect on the training of endurance, strength, speed-power qualities, speed and dexterity [8]. It also has a positive effect on the physical performance of students (according to the indicators of the Harvard Step Test) [7].

The application of the "Tabata" system is also relevant for the process of sports training. The results of the pedagogical experiment showed that the use of training according to the "Tabata" system allows to achieve a more pronounced increase in the level of general physical fitness of cadets of higher education institutions of the Ministry of Internal Affairs of Ukraine in the process of sectional judo classes, compared to traditional methods [5]. Also, in the course of the pedagogical experiment, a significant increase in the results of the physical fitness indicators of student athletes aged 17–20 years engaged in mini-football was established, namely, a significant improvement in the technique of performing exercises directly related to the effectiveness of technical and tactical actions in football [4].

We consider it relevant to continue scientific research in this direction and to study the effectiveness of the application of the "Tabata" system in the educational process of "Special physical training" for the development of strength abilities of cadets.

**The purpose of the work** was to research indicators of strength development of cadets under the influence of classes under the traditional program of "Special physical training" and under the influence of training under the "Tabata" system.

To achieve the set goal, the following research methods were applied: theoretical analysis and generalization of data from scientific and methodological literature and empirical materials of scientific research; pedagogical experiment; pedagogical examination (testing); methods of mathematical statistics. The following indicators were calculated in the study: mean values ( $\bar{X}$ ), standard deviations  $\sigma$ , Student's t- criterion.

The contingent of the researched consisted of two groups of cadets (men) of the second year of study, applicants for the educational degree "bachelor" in the specialty "Law enforcement activity". In the control group of the researched (19 people), the improvement of readiness indicators took place according to the traditional program of the educational discipline "Special physical training". An experimental group of 20 people was engaged in increasing the level of strength abilities using the "Tabata" training program developed by us. In the course of the research, indicators of the development of strength abilities were studied according to the tests [1, 9]: complex strength exercise, pull-ups on the crossbar, squats in 20 s, jump up from from a place, flexion and extension of the arms in the stop lying in 20 s. At the beginning of the pedagogical experiment, the level of physical fitness of the cadets of the control and experimental groups did not differ significantly ( $p < 0,05$ ).

**Presentation of the main material of the research.** The analysis of the obtained results shows that in the second year of training, the cadets have a high and above average level of strength development. As a result of the pedagogical experiment, a significant improvement ( $p < 0,05$ ) of the researched indicators of strength training was noted both in the control group (as a result of using traditional training methods) and in the experimental group (as a result of training according to the "Tabata" protocol (Table 1). However, in the experimental group, the increase in the level of strength training of the cadets was more pronounced.

Table 1.

Results of testing the physical fitness of cadets in the specialty "Law enforcement activity"

| Test                                                           | Group | The beginning of the pedagogical experiment |          | The end of the pedagogical experiment |          | p        |
|----------------------------------------------------------------|-------|---------------------------------------------|----------|---------------------------------------|----------|----------|
|                                                                |       | X                                           | $\sigma$ | X                                     | $\sigma$ |          |
| Pull-ups on the crossbar, times                                | K     | 13,3                                        | 1,5      | 14,2                                  | 1,3      | p < 0,05 |
|                                                                | E     | 13,2                                        | 1,5      | 14,6                                  | 1,3      | p < 0,05 |
| Squats in 20 seconds, times                                    | K     | 29,4                                        | 1,7      | 31,9                                  | 1,4      | p < 0,05 |
|                                                                | E     | 30,0                                        | 2,2      | 33,8                                  | 1,8      | p < 0,05 |
| Flexion-extension of the arms in the stop lying in 20 s, times | K     | 27,7                                        | 3,1      | 30,4                                  | 2,3      | p < 0,05 |
|                                                                | E     | 27,9                                        | 2,6      | 33,9                                  | 2,4      | p < 0,05 |
| Complex strength exercise, times                               | K     | 48,3                                        | 2,5      | 50,4                                  | 2,8      | p < 0,05 |
|                                                                | E     | 48,8                                        | 2,5      | 54,3                                  | 2,3      | p < 0,05 |
| Jump up from a place, cm                                       | K     | 41,0                                        | 2,4      | 41,9                                  | 2,0      | p < 0,05 |
|                                                                | E     | 41,4                                        | 2,8      | 43,1                                  | 2,1      | p < 0,05 |

Also, during the pedagogical experiment with the use of training according to the "Tabata" system, an increase in the emotional saturation of the physical training process and an increase in the efficiency of the process of mastering the technique of applying physical impact measures (detention techniques, throwing techniques, etc.) were noted.

**Conclusions.** The results we obtained showed that the use of the traditional method of developing motor skills in the educational process of the "Special Physical Training" discipline, as well as the use of training according to the Tabata system, allows us to achieve positive changes in the indicators of strength training of applicants for higher education. At the same time, according to our results, performing complexes of exercises according to the Tabata protocol allows to achieve a more pronounced improvement. This determines the relevance of its application in the process of conducting practical classes and independent work of cadets. The methodology, which is based on performing complexes of exercises according to the Tabata system, will allow to effectively supplement and expand the range of traditional means and methods of physical training of cadets of higher education institutions of the Ministry of Internal Affairs of Ukraine.

**Prospects for further research** in this area are to study a wider range of indicators of physical fitness of male and female students in higher education institutions with specific learning conditions under the influence of Tabata training and in the development of scientifically based recommendations for their improvement.

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DOI 10.31392/UDU-nc.series15.2023.11(171).02  
УДК: 796.332.015.14'06

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## **РОЛЬ ТА ЗНАЧЕННЯ РУХЛИВИХ ІГОР В ПРОЦЕСІ ПСИХОЛОГІЧНОГО ТА ПСИХОФІЗІОЛОГІЧНОГО РОЗВИТКУ ЮНИХ ФУТБОЛІСТІВ НА ЕТАПІ ПОЧАТКОВОЇ ПІДГОТОВКИ**

Організований футбол все частіше йде в розріз із можливостями та потребами дитини. Особливо критично дана тенденція виглядає на етапі початкової підготовки. Окрім негативних впливів на фізичний розвиток юних футболістів форсування підготовки та ігнорування їх вікових особливостей вкрай деструктивно позначається на психічному розвитку дітей. В статті проаналізовано можливості та переваги педагогічних засобів регуляції мотиваційних чинників та процесу формування цілого ряду психологічних якостей і здібностей юних футболістів у віці від 6 до 9 років. Запропоновані способи формування особистості юних футболістів. Формування спортивного характеру юних футболістів мають складати як командні дії так і індивідуальні особливості.

Зосередження на виховуванні дітей починається у середовищі яке формує їх. Найважливішим компонентом формування юної особистості є психологічний аспект. За рахунок різноманітних рухів з м'ячем і без нього діти можуть набувати ігрового досвіду. Адаптація вправ до потреб дитини є базовою умовою для профілактики травмуючих впливів та сприяння її гармонійного розвитку, створення передумов для стимуляції самостійного мислення, використовуючи принцип «намагайся знайти рішення». В роботі узагальнено дані спеціальних літературних джерел та вітчизняний практичний досвід, а також зроблено аналіз ключових факторів, що детермінують динаміку навчання і фізичний та психологічний розвиток юних футболістів. Показані механізми впливу використання педагогічних засобів ігрового характеру на процес формування мотиваційної, когнітивної та психо-емоційної сфери дитини молодшого шкільного віку, яка займається футболом.

**Ключові слова:** юні футболісти, розвиток, рухливі ігри, психологічні характеристики, вікові особливості.

**Bairachnyi O.V., Deineko I.V. The role and significance of mobile games in the process of psychological and psychophysiological development of young football players at the stage of initial training.** Organized football increasingly goes against the capabilities and needs of the child. This trend is especially critical at the stage of initial preparation. In addition to the negative effects on the physical development of young football players, forcing training and ignoring their age characteristics has an extremely destructive effect on the mental development of children. The article analyzes the possibilities and advantages of pedagogical means of regulating motivational factors and the process of forming a number of psychological qualities and abilities of young football players aged 6 to 9 years. Suggested methods of personality formation of young football players. The formation of the sports character of young football players should consist of both team actions and individual characteristics.

Focusing on raising children begins in the environment that shapes them. The most important component of the formation