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## Assessment of physical fitness level among 16-17 year-old boys at the beginning of the academic year during pre-professional physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation

Vladislav A. Nikitin, Gaik D. Aleksanyants\*, Sergey P. Arshinnik, Olesya A. Medvedeva, Mariya V. Gildash

Kuban State University of Physical Education, Sports and Tourism  
Krasnodar, Russia  
alexanyanc@mail.ru

ORCID: 0000-0002-3504-9483, alexanyanc@mail.ru\*

ORCID: 0000-0002-3788-0422, arshinnik\_fk@mail.ru

ORCID: 0000-0002-0361-6666, medvedeva-ol.an@mail.ru

ORCID: 0000-0003-4849-3193, gilgash8@gmasil.ru

**Abstract:** Nowadays the problem of professional orientation of high-school graduates for admission into higher educational institutions of defense and law enforcement agencies of the Russian Federation remains urgent. An essential factor in the pre-professional training of the future cadets is not only their level of motivation, psychological stability strengthening, socialization expansion, but also their physical fitness. In the last decade, decrease in physical fitness indices has been registered among the significant part of senior schoolchildren. The aim. The aim of the research was to assess the level of physical fitness among 16-17-year-old boys studying at secondary schools in Krasnodar in terms of pre-professional physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation. **Research methods:** scientific-methodical information sources analysis, pedagogical testing and methods of mathematical statistics. We took into consideration strength abilities according to the amount of the fulfilled exercise "Flexion and extension of the arms from the hanging position on a high crossbar with over-grasp". Speed-oriented abilities were studied based on the results of 60-meters run. Coordination abilities were determined according to the time of 3x10 meters shuttle run realization. The measurement of general endurance level development was carried out according to the time of 2000 meters running. "Leaning forward from a standing position" exercise helped to judge the level of respondents' flexibility. We also revealed speed-strength oriented abilities of lower extremities muscles (standing long-jump) and body muscles (body lifting from prone position within 1 minute). The observation was carried out on the basis of secondary school No. 32 named after Dzerzhinsky F. E., secondary school No. 35 named after Hero of the Soviet Union Evgeny Kostylev in Krasnodar and the laboratory of Anatomy and Sports Medicine Department of the Kuban State University of Physical Culture, Sports and Tourism. 16-17 year-old boys took part in the research. **Scientific novelty.** We revealed the parameters of physical readiness. They are typical for the male students of the 10-11th grades of general education schools in Krasnodar, who participate in pre-professional physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation. **Research results.** The analysis of the data obtained demonstrated that 37.5% of the examined students had physical fitness indices that did not correspond with the "model" characteristics. The practical significance of the study results allows optimizing the individual composition and content of physical exercises, the realization conditions, the number of repetitions, taking into account the physical fitness of the 10-11th grade boys. **Conclusion.** The current program of the academic discipline "Physical Culture" does not fully create conditions for increasing the level of physical fitness and does not sufficiently ensure the development of physical qualities of the 10-11th grade students. It is reasonable to optimize the program.

**Keywords:** 16-17 year-old students, physical fitness, the beginning of the school year, pre-professional training.

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### **Introduction**

High-school graduates still face the problem of choosing profession, which is based on their notions of social status, notional content, prestigiousness and other conditions of professional regulation [10].

At the same time, secondary school has the aim of pupils' civil responsibility upbringing and formation in terms of state benefit and social interests and also in terms of the professional preferences' aspects [11].

Nowadays the problem of high-school graduates' professional orientation for admission into higher educational institutions of defense and law enforcement agencies of the Russian Federation remains urgent. An essential factor in the pre-professional training of the future cadets is not only their level of motivation, psychological stability strengthening, socialization expansion, but also their physical fitness [2, 12, 14].

In the last decade, a decrease in physical fitness indices has been registered among a significant part of senior schoolchildren.

According to the results received by A.V. Gileva, K.D. Kochnev (2018), N.N. Sizova, Yu. D. Ismagilova (2020) and others, only 14-18,5% of senior schoolchildren are considered almost healthy. The results of scientific research works "Young generation" show that according to the results of physical training norms fulfillment till 70% of the arrived (former high-school graduates) recruits show unsatisfactory results. So called "motor activity deficiency" is formed [3].

It means that the existing real volume of motor activity of high-school graduates doesn't provide physical development and physical readiness improvement. "Physical culture" discipline belongs to the basic level of compulsory subjects according to the Federal State Educational standard.

At the same time, the intensity of physical loads during physical culture lessons decreases, motor activity of high-school graduates during extracurricular activity decreases.

In scientific information sources there are several works connected with studying the conditions of insufficient degree of high-school graduates' physical readiness [3, 5, 14]. Among these conditions are the following: the absence of general criteria of high-school graduates' physical readiness estimation, insufficient studying the values of physical culture, insufficient volume of general theoretical and methodological character knowledge on the process of physical training among senior schoolchildren.

Undoubtedly, physical culture with its great arsenal of the developing and forming means should take one of the leading places in professional

physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation [8].

As the analysis of the information sources shows, in physical culture theory and methodology there is a problem situation. It is reflected, on the one hand, in the need for the level of physical readiness increase among senior schoolchildren, and on the other hand, in the need for an effective scientifically substantiated methodology of pre-professional physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation [7, 9].

The aim of the present stage of the research was to assess the level of physical fitness among 16-17-year-old boys studying at secondary schools in Krasnodar in terms of pre-professional physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation.

### **Materials and methods**

The set aim achievement was realized by means of physical fitness indices revelation among 16-17-year-old senior schoolchildren at the beginning of a school year. During the aim realization we used the following research methods: scientific-methodical information sources analysis, pedagogical testing and methods of mathematical statistics.

After the published data analysis and summarizing we defined reasonable research methods.

We took into consideration strength abilities according to the amount of the fulfilled exercise "Flexion and extension of the arms from the hanging position on a high crossbar with over-grasp". Speed-oriented abilities were studied based on the results of 60-meters run. Coordination abilities were determined according to the time of 3x10 meters shuttle run realization (standing start). The measurement of general endurance level development was carried out according to the time of 2000 meters running (standing start). We used electronic stop-watch for the results registration (accuracy 0,01 s). "Leaning forward from a standing position" exercise helped to judge the level of respondents' flexibility. We also revealed speed-strength oriented abilities of lower extremities muscles (standing long-jump) and body muscles (body lifting from prone position within 1 minute).

It should be noted that mentioned above exercises correspond with the program of tests of All-Russian physical culture and sport "Ready for Labor and Defense" complex [11].

During the research the received results went

through mathematical handling [5]. During the samplings with normal distribution registration we calculated the arithmetic mean, the level of a standard deviation, the mistake of arithmetic mean, the volume of variation coefficient. The validity of differences between the received parameters were calculated according to Student's t-test. 5% validity threshold (low) was accepted. It guaranteed the accuracy of the comparison in such research works.

The observation was carried out on the basis of a municipal autonomous general education establishment secondary school No. 32 named after Dzerzhinsky F. E., secondary school No. 35 named after Hero of the Soviet Union Evgeny Kostylev in Krasnodar and the laboratory of Anatomy and Sports Medicine Department of the federal state budgetary educational establishment of higher education "Kuban State University of Physical Culture, Sports and Tourism". 48 16-17 year-old boys (the 10th-11th grades) took part in the research. They took part

in pre-professional physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation

The pupils participated in the research voluntarily, we got written informed consent.

### **Results and discussion**

At the present stage of the research we realized the stating experiment for physical readiness revelation among the respondents.

As the comparative data we used the parameters of "model" values of schoolchildren's physical readiness at 6 educational establishments in Krasnodar [1]. The table presents the results of the carried out research work.

As the received results showed (the results are presented in the table) physical readiness indices of 62,5% of pupils correspond with "model" values (Fig.).

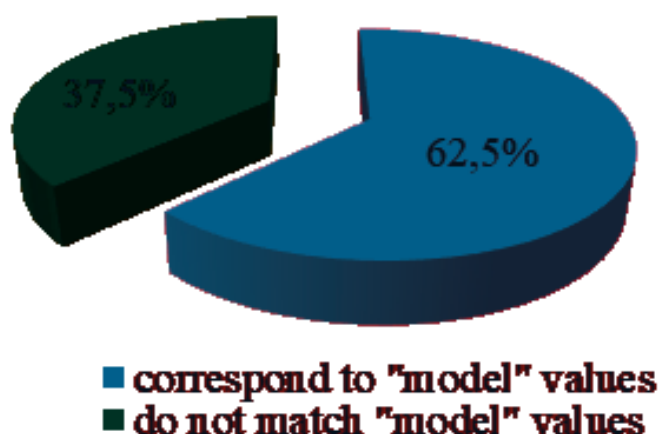


Fig. Pupils' physical readiness indices correspondence with "model" values

Table

Pupils' physical readiness indices (boys of the 10th-11th grades) of educational establishments (secondary schools № 32 and 35) at the beginning of school year

| Physical abilities      | Physical readiness indices  | The examined group<br>n = 48 |      |      | Rank place |
|-------------------------|---|------------------------------|------|------|------------|
|                         |   | X±m                          | σ    | V, % |            |
| Speed-oriented          | 60 meters running (s)   | 9,10±0,05                    | 0,35 | 3,8  | 1          |
| coordination            | Shuttle run 3 x 10 m (s)  | 7,30±0,07                    | 0,49 | 6,65 | 2          |
| Speed-strength oriented | Standing long-jump (cm)   | 208,2±11,6                   | 23,6 | 11,3 | 3          |
| Endurance               | 2000 m running (s)  | 538,4±12,3                   | 85,2 | 15,8 | 4          |
| Speed-strength oriented | Body lifting from prone position within 1 min (amount)  | 40,2±1,4                     | 9,7  | 24,1 | 5          |
| Strength oriented       | Flexion and extension of the arms from the hanging position on a high crossbar with over-grasp (amount) | 8,2±0,5                      | 3,47 | 42,3 | 6          |
| Flexibility             | Leaning forward from a standing position (cm)   | 6,6±0,5                      | 3,46 | 52,5 | 7          |

The results analysis demonstrated that it is reasonable to divide the pupils, whose indices didn't correspond with "model" characteristics, into two categories: the 1st category – pupils, who have insignificant level of physical readiness, for the 2nd category not high level of the separate physical qualities formation is typical. At the same time, we registered variability (diversity) of the received data (from 3,8% to 52,5%). Minimal variability was registered in the following exercises: 60 meters running, shuttle running 3x10 meters, 2000 meters running, standing long-jump. Speaking about other exercises, the received parameters show great data diversity. In comparative aspect in the observed group of the pupils of the 10th-11th grade we registered significant ( $p < 0,05$ ) differences of physical readiness indices from "model values" in the following tests: 60 meters running ( $t - 4,31$ ), shuttle running 3x10 meters ( $t - 5,64$ ), 2000 meters running ( $t - 11,68$ ). Speaking about other exercises, we didn't reveal differences in the compared indices.

### Conclusion

The existing nowadays program of "Physical culture" discipline doesn't fully create the conditions for the level of physical readiness increase among the pupils of the 10th-11th grade at secondary schools.

It is reasonable to organize "Physical culture" program optimization for the pupils of this age group (including the case of pre-professional physical training for studying at higher education institutions of defense and law enforcement agencies of the Russian Federation). It includes the basic objectives realization: physical readiness "increase", physical qualities proliferation, mastering motor and applied

skills, progress in studies improvement and others.

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**Author's information:**

**Vladislav A. Nikitin** – Post-graduate, Kuban State University of Physical Education, Sports and Tourism, 350015, Russia, Krasnodar, Budennogo str., House 161, e-mail: [alexanyanc@mail.ru](mailto:alexanyanc@mail.ru)

**Gaik D. Aleksanyants** – Professor, Kuban State University of Physical Education, Sports and Tourism, 350015, Russia, Krasnodar, Budennogo str., House 161, e-mail: [alexanyanc@mail.ru](mailto:alexanyanc@mail.ru)

**Sergey P. Arshinnik** – Associate Professor, Kuban State University of Physical Education, Sports and Tourism, 350015, Russia, Krasnodar, Budennogo str., House 161, e-mail: [arschinnik\\_fk@mail.ru](mailto:arschinnik_fk@mail.ru)

**Olesya A. Medvedeva** – Associate Professor, Kuban State University of Physical Education, Sports and Tourism, 350015, Russia, Krasnodar, Budennogo str., House 161, e-mail: [medvedeva-ol.an@mail.ru](mailto:medvedeva-ol.an@mail.ru)

**Mariya V. Gildash** – Graduate, Kuban State University of Physical Education, Sports and Tourism, 350015, Russia, Krasnodar, Budennogo str., House 161, e-mail: [gilgash8@gmasil.ru](mailto:gilgash8@gmasil.ru)

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