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To the issue of standards substantiation for assessing sports and technical readiness of students of the main department of overall physical condition-athleticism training groups

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Abstract: RThe article examines the following: the objectivity of students' sports and technical readiness assessment at the 1st-2nd courses of the main department of overall physical condition training groups with sports orientation (athleticism), age-related and gender characteristics of the special motor readiness indices tempos increase in a semester. ***Research methods and material.*** For sports-technical readiness assessment among the students of the main department of overall physical condition training groups with sports orientation (athleticism) we used the following exercises: benchpress and back squat. Sports-technical readiness testing among the students of the 1st-2nd course was held at the beginning and the end of a spring term. In general 32 boys and 41 girls of the 1st course and 25 boys and 56 girls from the 2nd course were examined. ***Results.*** The same results were received during students' sports-technical readiness estimation and the results of validity estimation of the differences according to Student's t-test. It was stated that the boys of the 2nd course of the main department of overall physical condition-athleticism training groups have the advantage over the 1st course students in power of legs and hands extensor muscles. At the same time the girls of the 1st and the 2nd course didn't have valid differences in these indices. The power of legs and hands extensor muscles among the boys of the 1st and the 2nd courses and the girls of the 1st and the 2nd courses have the same tempo of development during the term. The power of legs extensor muscles among the girls of the 2nd course has higher development tempo, than the development tempo of the 1st course female students. The power of legs extensor muscles has the same development tempo during the term among the boys and girls of the 1st course. The power of hands extensor muscles has higher development tempo among boys, both at the 1st and the 2nd courses, in comparison with the coevals. Among the girls of the 2nd course these tempos are validly higher in comparison with the coevals. The increase of benchpress indices during spring term, both among boys and girls of the 1st and the 2nd courses is estimated as three points. The increase of back squat indices among the boys of the 1st and the 2nd courses is estimated as 3 points, among the girls of the 1st course – as 3 points, among the girls of the 2nd course –as 4 points. ***Conclusion***. The created standards for sports and technical readiness assessment among the students of the main department of overall physical condition training groups with sports orientation (athleticism) estimate the effectiveness of practical lessons in a term. We revealed age-related and gender characteristics of the strength-oriented abilities development tempos among the boys and girls of the 1st-2nd course of the main department of overall physical condition training groups with sports orientation (athleticism).
Keywords: sports and technical readiness, testing, effectiveness of practical lessons, students, athleticism.

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Introduction

In the Model program of "Physical culture" discipline one of the practical lessons effectiveness indicators for students of the main department is sports-technical readiness (STR) [1]. It is connected with the process of teaching and the technique of movements improvement in kinds of sport. They are taught at a higher educational establishment. As the practice shows, in terms of this process the interest of students in practical lessons increases. At the same time there are no tests and standards in the Model program. They can help to estimate STR of students of the main department. It also concerns the training groups of overall physical condition (OPC) with different sports orientation, including the overall physical condition-athleticism training groups.

The students of this department fulfill physical exercises with dumbbells, shock-absorbers, weight, using different training simulators in a fitness room [2]. The main objective of these lessons is strength-oriented abilities of body muscles development.

We determined effective methodologies of organism functional abilities development, general physical and strength-oriented readiness improvement among students. They are involved into body-building [2, 3].

In order to estimate strength-oriented abilities we use well-known tests, such as benchpress and back squat and others [4, 5, 6 and others].

The results of the research [7] prove the absence of valid differences in changes (shifts) within the term of benchpress and back squat indices, both among boys and girls of the main department of different weight categories. It was stated that benchpress indices among the boys and girls don't have valid differences, but the shifts of the indices of the second test (back squat) differ validly. These results formed the base of the standards of STR estimation among students of the main department of overall physical condition-athleticism training groups [7, 8]. Improvement of the STR estimation standards among the students of the main department of overall physical condition-athleticism training groups is an urgent objective.

Special literature sources analysis also showed the absence of practical lessons effectiveness results estimation of "Physical culture" discipline among the students of main department of overall physical condition-athleticism training groups on the basis of STR standards.

It means that the problem of sports-technical readiness estimation standards improvement among the students of the main department of overall physical condition-athleticism training groups on the basis of its dynamics peculiarities during the term and practical lessons of "Physical culture" discipline effectiveness estimation using the substantiated STR standards is an urgent problem of the research.

The objectives of the research:

1. To estimate the effectiveness of educational-training lessons of "Physical culture" discipline according to STR standards among the students of the 1st-2nd course of the main department of overall physical condition-athleticism training groups.
2. To compare the results of STR testing with the results of differences validity according to Student's t-test.
3. To reveal age-related and gender characteristics of strength-oriented abilities development tempos among the boys and girls of the 1st-2nd courses during a spring term.

Materials and methods

In order to estimate sports-technical readiness of students of the main department of overall physical condition training groups with sports orientation (athleticism) we used well-known and used during practical lessons tests [8]:

1. Benchpress. Initial position – prone position on a horizontal bench, barbell is on the stand over the head. At the command grasp the grip and hold it with the straight hands. Then lower the barbell to the middle of the chest and lift it up, return to the initial position. We define maximal weight of the lifted barbell. During the test it is necessary to stand by if the weight of the barbell is 90% of the maximal result and higher.
2. Back squat. Initial position – stand under the desk with the barbell, legs shoulder-width apart and knees are slightly bent, back is straight; grasp the grip, the barbell is on shoulders. At the command unbend the knees, holding the barbell on shoulders, make a step backward. Fulfill a squat till 900 angle in the knees and return into the initial position. We define maximal weight of the barbell. During the test it is necessary to stand by if the weight of the barbell is 90% of the maximal result and higher.

The results of testing were handled with the help of mathematical statistics methods: we defined mean values (M), quadratic deviation (σ). Normality of the research results distribution was estimated according to asymmetry (As) and excess (Ex) coefficients. In cases of normal distribution of STR indices among the students the validity of differences was defined according to Student's t-test for pairwise-connected variants. In case of normal distribution absence we used nonparametric Wilcoxon-Mann-Whitney test.

The base of practical lessons methodology of overall physical condition-athleticism training groups of students from the main department formed the recommendations by O.Yu. Davydov [3] and modern notions of strength-oriented abilities development [5, 10, 11, and others]. Educational-

methodical manual presents planning the content of lessons among the students of the main department of overall physical condition-athleticism training groups [9].

STR testing among the 1st-2nd course students was held at the beginning and the end of spring term. In general 32 boys and 41 girls of the 1st course and 25 boys and 56 girls of the 2nd course were examined. The students joined training groups at the beginning of each term. The students of the 1st and the 2nd courses had the same amount of practical lessons during spring term – 24 lessons each course. The students had 3 lessons in two weeks.

Results and discussion

We stated that the studied STR indices among the 1st-2nd course students corresponded with the law of normal distribution. On the basis of this fact the validity of differences was defined with the help of Student's t-test.

First of all we estimated the tempos of STR results increase among the boys and girls within the term on the basis of the created standards [6]. The increase of benchpress indices during the term, both among the boys and girls of the 1st and the 2nd courses, received 3 points (the average level). The increase of back squat indices among the boys of the 1st and the 2nd courses received 3 points. Among the girls of the 1st course – 3 points, the girls of the 2nd course – 4 points (above the average).

The results of STR testing among the students prove mainly the average effectiveness of practical lessons. Not high marks in tempos of the studied indices increase are apparently connected with insufficient amount of practical lessons during spring term (three tempo).

We studied the dynamics peculiarities of STR indices with the help of Student's t-test. We revealed valid differences ($p<0,01$) in the results of benchpress and back squat, both among boys and girls of the 1st and the 2nd courses since the beginning till the end of the term. It also proves the effectiveness of practical lessons.

Thus, the created standards of STR estimation among the students of the main department of overall physical condition- athleticism training groups can objectively estimate the effectiveness of practical lessons in a term.

We examined age-related and gender characteristics of the legs and hands extensor muscles power development tempos among boys and girls of the 1st and the 2nd courses during the term.

Benchpress and back squat indices were validly higher among the boys of the 2nd course in comparison with the 1st year students, both at the beginning and the end of the term. Among the girls these differences were invalid. It means that the boys of the 2nd course of the main department of overall physical condition- athleticism training groups have the advantage over the first-year students in power of legs and hands extensor muscles. Girls of the 1st and the 2nd courses don't have valid differences in these indices.

The boys, both of the 1st and the 2nd courses have validly higher ($p<0,01$) results in comparison with the girls in benchpress and back squat at the beginning and the end of the term.

The tempos of back squat indices increase within the term among the boys of the 1st and the 2nd courses don't have valid differences. Among the girls of the 1st and the 2nd courses the shifts of benchpress indices also don't have valid differences, but back squat indices changes were validly higher among the 2nd course girls ($p<0,01$). It means that legs and hands extensor muscles power among the boys of the 1st and the 2nd courses and the power of hands extensor muscles among the girls of the 1st and the 2nd courses increase during the term almost at the same level. The power of legs extensor muscles among the girls of the 2nd course develops quicker than among the 1st-year female students.

Benchpress indices changes within the term are validly higher among the boys in comparison with the girls, both at the 1st and the 2nd courses ($p<0,05$ and $p<0,01$). The shifts of back squat indices among the boys and girls of the 1st course don't have valid differences and among the girls of the 2nd course they are validly higher in comparison with the coevals ($p<0,01$). Thus hands extensor muscles power develops quicker among the boys, both of the 1st and the 2nd courses in comparison with the female coevals. Legs extensor muscles power has the same development tempos during the term among the boys and girls of the 1st course. Among the girls of the 2nd course these tempos are validly higher in comparison with the coevals.

The novelty of the research is in an additional way use of STR standards estimation substantiation among the students of overall physical condition-athleticism training groups: comparative analysis of the marks of STR indices increase tempos and the results of their differences validity according to Student's. We estimated the effectiveness of practical lessons according to the improved STR standards. We revealed age-related and gender characteristics of the power oriented abilities development tempos among the boys and girls of the 1st and the 2nd courses of overall physical condition-athleticism training groups in terms of 24 lessons during spring semester.

Conclusion

1. The created standards of STR estimation among the students of the main department of

overall physical condition-athleticism training groups objectively estimate the effectiveness of practical lessons in a term. We revealed the average level of practical lessons effectiveness among the students of the 1st and the 2nd courses of overall physical condition-athleticism training groups in terms of 24 lessons in a semester.

2. The boys of the 2nd course of the main department of overall physical condition-athleticism training groups have significant advantage over the 1st course students in legs and hands extensor muscles power. The girls of the 1st and the 2nd course don't have valid differences in these indices.

3. The boys, both of the 1st and the 2nd courses, have significantly higher ($p<0,01$) indices in benchpress and back squat in comparison with the girls at the beginning and the end of the term.

4. Legs and hands extensor muscles power among the boys of the 1st and the 2nd courses and hands extensor muscles power among the girls of the 1st and the 2nd courses have the same tempos of increase during the term. Legs extensor muscles power among the girls of the 2nd course have higher development tempos than the 1st course female students.

5. Hands extensor muscles power develops quicker among the boys, both of the 1st and the 2nd courses, in comparison with the female coevals. Legs extensor muscles power has the same development tempos during the term among the boys and girls of the 1st course. Among the girls of the 2nd course these tempos are validly higher in comparison with the coevals.

6. Benchpress indices increase within spring term, both among boys and girls of the examined courses receive three points. Back squat indices increase among the boys of the 1st and the 2nd courses receives 3 points, among the girls of the 1st course – 3 points, among the girls of the 2nd course – 4 points.

7. As a result of educational-training lessons the boys and the girls of the 1st and the 2nd courses have valid legs and hands extensor muscles power increase. It in general proves the effectiveness of the held during spring term practical lessons.

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