

UDC 796

DOI: 10.14526/2070-4798-2023-18-1-132-137

The formation level of functional and motor potential among students of special medical groups during physical culture lessons

Larisa Yu. Kotkova^{1*}, Lyutsiya Sh. Shaymardanova²
¹Naberezhnye Chelny branch of "TISBI Management University"
Naberezhnye Chelny, Russia
ORCID: 0000-0001-7383-2850, klumeg@mail.ru*
²Yelabuga Institute of Kazan Federal University,
Yelabuga, Russia
ORCID: 0000-0003-4130-9365, sh.lutsia@mail.ru

Abstract: While studying at a higher educational institution students face with great volume of educational load. It causes nervous-psyche tension, the level of mental and physical working capacity decrease. The increased stress and fatigability influence of students with poor health state. They belong to special medical groups (SMG). The success of education mainly depends on the state of the functional and motor systems of students' organisms. In this connection timely diagnostics of these parameters would help to differentiate the loading regimens during physical culture lessons and achieve positive normalization of students' motor functions. **Material.** The article considers the influence of physical culture lessons of health-improving orientation on the state of the functional and motor development of SMG female students. Research methods: scientific-methodical information sources analysis, testing, pedagogical observation, methods of mathematical statistics. **Scientific novelty** of the research is in new information getting concerning the influence of physical culture lessons of health-improving orientation on the indices of the functional state and motor development of female students from SMG. **Results.** The research results analysis revealed positive influence of health-improving orientation on the dynamics of functional systems indices and motor development of female students from SMG, with the preliminary influence on respiratory system, strength oriented endurance and flexibility development. **Practical significance** of the research is in the opportunity to get additional information concerning the dynamics of the functional and motor development of female students from SMG and physical culture educational process timely correction. **Conclusion.** Physical culture lessons of health-improving orientation have a positive influence on the functional and motor development indices of female students from SMG. However, they have insufficient influence on the level of coordination abilities development. In this connection there appears the necessity to include additional means into physical culture program.

Keywords: functional state, motor development, students of special medical group.

For citation: Larisa Yu. Kotkova*, Lyutsiya Sh. Shaymardanova. The formation level of organism functional and motor potential among students of special medical groups during physical culture lessons. Russian Journal of Physical Education and Sport. 2023; 18(1): 109-113. DOI: 10.14526/2070-4798-2023-18-1-132-137.

Introduction

Higher education is one of the main steps on the way to professional formation of each person. While studying at a higher educational institution students face with great volume of educational load, which causes nervous-psyche tension, the level of mental and physical working capacity decrease. The increased stress and fatigability influence organisms of students with poor health state, who belong to special medical groups (SMG). Several authors revealed that the success in education mainly depends on the state of the functional and motor systems of students' organisms [1]. Regular

physical loads provide organism adaptive abilities to stress increase, it means organism main systems mobilization and steady functioning.

Students with health problems are divided into the groups, taking into account the specificity of diseases. There are "A" and "B" special medical groups. SMG "A" includes the students, who have serious innate health state disorders or chronic diseases at the stage of compensation. Group "B" includes the students with chronic health disorders at the stage of supercompensation [3].

As our own research results show, most students of SMG at Yelabuga Institute of Kazan Federal

University (66,6%) have steady innate health state disorders or chronic diseases, which are mainly connected with sensory and motor systems disorders [2].

Timely diagnostics, functional and motor state of SMG students' organism control would help to differentiate load regimens of physical exercises fulfillment during physical culture lessons, achieve positive normalization of motor functions, evaluate own state of an organism and the ability to bring up the need for sound health.

The aim of the research is to reveal the peculiarities of a functional and motor development of an organism among female students from SMG during health-improving kinds of physical culture mastering.

The objectives of the research:

1. To study the indices of the functional state and motor development of female students from SMG at the beginning of an academic year.
2. Analyze the influence of health-improving kinds of physical culture on the functional and motor state of organism among female students from SMG.

Materials and methods

The research work was held on the basis of Yelabuga Institute of Kazan Federal University in Yelabuga, the Republic of Tatarstan. The female students of the 2nd-3rd courses from SMG took part in the research (40 people) since September, 2022 till March, 2023. For the research results

handling we used the following methods: scientific-methodical information sources analysis, testing, pedagogical observation, methods of mathematical statistics.

Results and Discussion. By the beginning of the research we studied the peculiarities of cardiovascular and respiratory systems functioning, the indices of quickness, flexibility, strength endurance and coordination abilities development among 2nd-3rd course female students from SMG at Yelabuga Institute of Kazan Federal University according to the following tests: Stange's test, Genche test, Martinet test, ruler catching, forward lean, body lifting from prone position within 1 minute, knees push-up, Romberg's test ("heel-forefoot" pose). While studying the level of motor abilities development among female students from SMG we used control norms, presented in Physical culture and sport elective disciplines (modules) working program for a special medical group.

At the beginning of the research the state of respiratory system among female students from SMG was within the normal range, the reaction of cardiovascular system to the load among most students had "satisfactory" mark.

The indices of strength endurance in "Body lifting from prone position" test were within the normal range, in "Knees push-up" test –below the normal range. The indices of coordination and flexibility development among female students from SMG at the beginning of the research were lower than characteristic values (Table 1).

Table 1

Indices dynamics of organism functional state and motor development among the 2nd-3rd course female students from SMG during the period of the research

Indices	2 course		3 course		Norm
	before	after	before	after	
Functional state					
Stange's test, sec.	34,37±2,9	39,89±3,1*	38,72±2,6	41,9±3,1	30-40
Genche test, sec.	29,65±3,8	33,82±2,1*	35,18±2,8	40,9±1,9*	15-30
Martinet test, mark, % of students	good – 10,3% satisf. – 79,3% unsatisf. – 6,8%	good – 13,7% satisf. – 86,2%	good – 36,3% satisf. – 63,6%	good – 36,3% satisf. – 63,6%	<3 min. – good; from 3 till 4 min. – satisf.; > 4 minutes – unsatisf.
Motor development					
Knees push-up, amount of times	5,34±2,8	6,79±3,4*	6,18±2,4	7,72±3,2*	7-8
Body lifting from prone position, amount of times	23,55±3,8	29,06±3,2*	25,09±2,4	30,18±1,6*	20-30
Forward lean sitting, amount of times	-1,27±4,2	3,0±3,6*	-2,09±2,1	4,18±2,8*	12-15
Ruler catching, cm	25,65±2,8	18,82±3,1*	26,0±1,4	22,9±2,5	13-17
Romberg's test ("heel-forefoot" pose), sec.	11,2±1,9	12,72±1,6	11,72±1,6	13,0±2,1	15-17

Note: * - valid differences (tp > tcr in terms of p =0,05).

At the beginning of the research we estimated the level of motor abilities development among the 2nd-3rd course female students from SMG according to normative criteria of Physical culture and sport elective disciplines (modules) working program for

the students from SMG.

We revealed that strength endurance of abdomen muscles among the most part of female students (68,9% - 2 course and 63,6% - 3 course) was within "good" mark, strength endurance of the upper

shoulder girdle got “unsatisfactory” mark (48,2% - 2 course, 36,3% - 3 course).

In flexibility development indices the mark is mainly “satisfactory” 55,1% of students of the 2nd course and 54,5% of students of the 3rd course.

Quickness of reaction got “satisfactory” mark among 72,4% of female students of the 2nd course and 45,4% of female students of the 3rd course.

The ability to keep the balance among most female students from SMG got “unsatisfactory” mark (86,2% - 2 course, 72,7% - 3 course).

As a result of attending physical culture classes of health-improving orientation according to “Track and field athletics-health-improving kinds” and “Remedial gymnastics” units female students of the

2nd-3rd courses from SMG had positive changes in the functional state and motor development indices (Pic.1).

The 2nd course female students from SMG had valid increase in respiratory system state in Stange’s and Genche tests, in strength endurance, flexibility and quickness of reaction development. The students of the 3rd course had valid changes in respiratory system state in Genche test, in strength endurance and flexibility development.

The indices of cardiovascular system rehabilitation after physical load in Martinet test among the 2nd course female students from SMG slightly improved, among the 3rd course students they didn’t change. Insignificant changes were in the indices of balance keeping among the respondents.

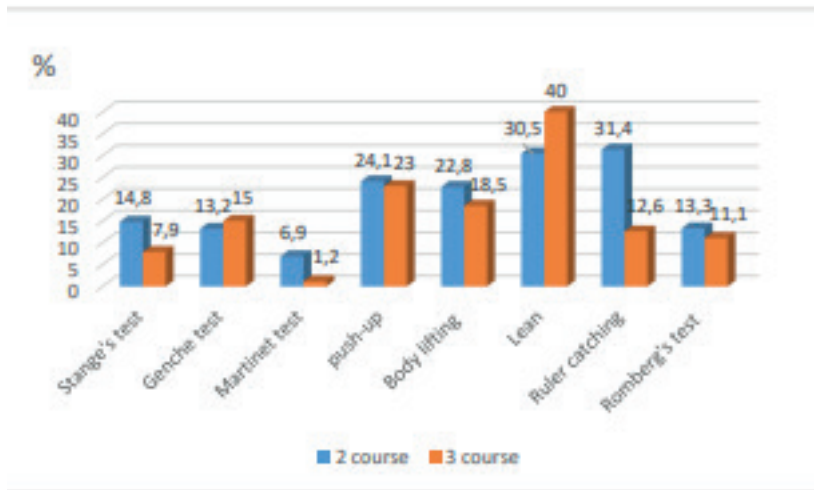


Fig. 1. Tempos of functional state and motor development indices increase among female students from SMG within the period of the research

During the research there were the changes in motor development indices marks among female students from SMG (Fig. 2-5).

We see significant percentage increase of the 2nd course female students from SMG, who got “excellent” and “good” marks for strength

endurance, flexibility and quickness of reaction development. The percentage of the 2nd course female students from SMG, who have “satisfactory” and “unsatisfactory” marks, according to all indices of motor development, decreased (Fig. 2-3).

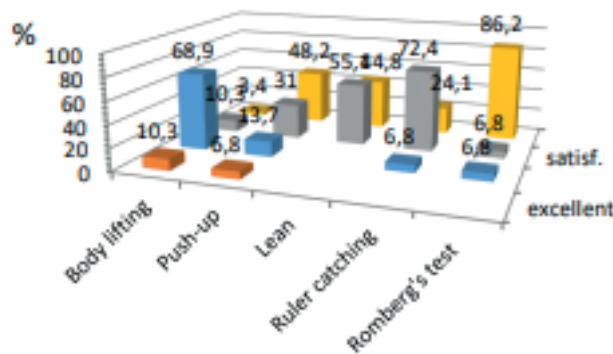


Fig. 2. Percentage of the 2nd course female students from SMG according to the motor development indices estimation at the beginning of the research

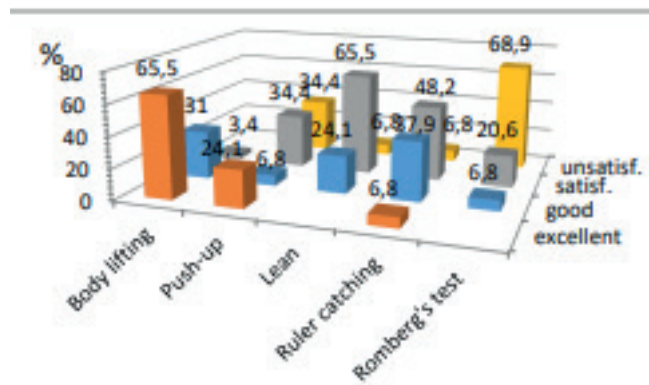


Fig. 3. Percentage of the 2nd course female students from SMG according to motor development indices estimation in the end of the research

At the 3rd course during the period of the research the percentage of female students from SMG, who have “excellent” and good” marks according to all indices of motor abilities development increases.

There almost no students with “satisfactory” and “unsatisfactory” marks according to all indices, apart from quickness of reaction and the ability to keep the balance (Fig. 4-5).

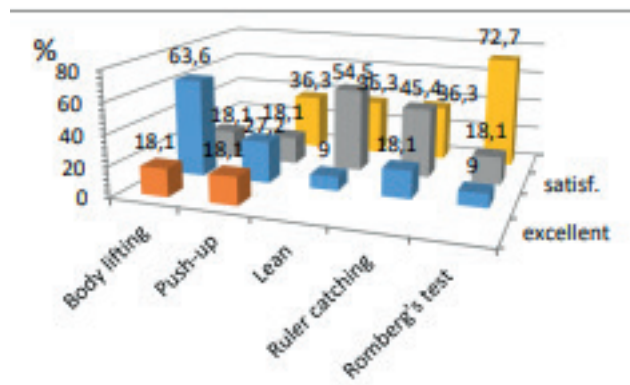


Fig. 4. Percentage of the 3rd course female students from SMG according to motor development indices estimation at the beginning of the research

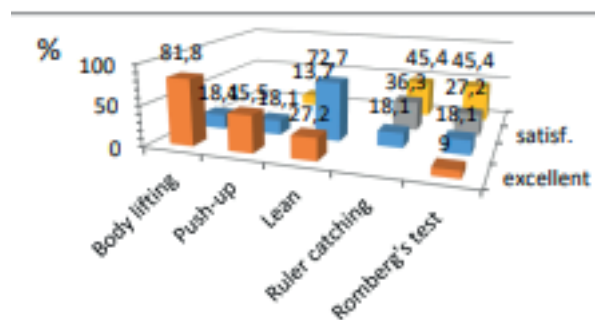


Fig. 5. Percentage of the 3rd course female students from SMG according to motor development indices estimation in the end of the research

Conclusion

Physical culture classes of health-improving orientation, which include “Track and field athletics-health-improving kinds” and “Remedial gymnastics” units, have positive influence on the functional state of an organism and some indices of motor development among female students from SMG.

First of all, the greatest development get such motor abilities, as strength endurance and flexibility,

the indices of cardiovascular system rehabilitation after the load and respiratory system abilities in terms of complicated conditions also improve.

The level of such coordination abilities, as quickness of reaction and the ability to keep the balance hardly increases.

In our opinion, this fact is conditioned by insufficient level of coordination abilities formation and contra indications to fulfill the exercises of difficult for coordination orientation among students

from SMG, which leads to means use restriction in this group at physical culture lessons.

This problem solution can become “Sports games” unit inclusion into physical culture program for students from SMG. The unit includes specially selected games of adaptive sport for people with vision disorders and locomotor apparatus disorders.

References

1. Anisimova A.Yu., Ryabov M.E., Gorshkova S.V. Dynamics of physical qualities indices among first-year students of technical University. *Pedagogiko-psihologicheskie I mediko-biologicheskie problemy fizicheskoy kul'tury = Russian Journal of Physical Education and Sport*. 2021; 16(3): 62-67.

2. Kotkova L.Yu., Shaymardanova L.Sh., Evseeva A.R. Methodical support of lessons according to physical culture and sport elective disciplines (modules) with the students of special medical group. *Pedagogiko-psihologicheskie I mediko-biologicheskie problemy fizicheskoy kul'tury = Russian Journal of Physical Education and Sport*. 2022; 17(2): 51-56.

3. Yantsen T.A. Physical education of special medical groups students. *Nauchnye raboty yunnyh uchenyh: materials XI Mezhdunarodnoj nauchno-prakticheskoy konferencii* [Research works of young scientists: materials of the XI International scientific-practical conference]. Kazan: Young scientist. 2022: 65-68.

Submitted: 20.02.2023

Author's information:

Larisa Yu. Kotkova – Candidate of Pedagogics, Associate Professor, Naberezhnye Chelny branch of TISBI Management University, 423803, Russia, Naberezhnye Chelny, Marshala Zhukova str., House 20, block 103, [e-mail: klumeg@mail.ru](mailto:klumeg@mail.ru)

Lyuciya Sh. Shaymardanova – Senior Lecturer, Yelabuga Institute of Kazan Federal University, 423606, Russia, Yelabuga, Khirurg Nechaeva str., House 10, block 44, [e-mail: sh.lutsia@mail.ru](mailto:sh.lutsia@mail.ru)
