

Improvement of adaptation in university students with disabilities

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Abstract

The urgency of applied physical education for students with health conditions is shown, as soon as applied physical education can provide adaptation to professional activities in case of the effective organization of educational process. This work aims to reconsider the function of professional physical education of students and to provide a clear formulation of the pedagogical tasks of applied physical education and its relationship with other types and forms of physical education. During 2018-2021 a pedagogical experiment was conducted. The experiment involved 2 groups of students 15 people each (the control and experimental groups). Our experimental methodology was based on the use of professionally applied physical education in the second, fourth and sixth semesters to increase physical fitness and reduce the adaptation period of students. The effectiveness of our program was evaluated with criteria, which reflected adaptive capabilities of the body. The result obtained reflects ways to improve the methodology of applied physical training. Indicators of applied physical education create the prerequisites for ensuring success in the future professional activities of students of all health groups.

Keywords: university, applied training, training system, modern education, professional performance

Introduction

Successful professional performance and compliance with specific job requirements depend on self-organization mechanisms, which ensure optimal quality of life of a person (Nagornov et al, 2008). In Russia, the focus is on theoretical knowledge and its transfer, while skills and abilities play a supporting role. Professional education provides knowledge and skills, prepares for life, forms an appropriate worldview, while knowledge control is traditionally used to test the knowledge or skills formed as a result of academic performance (Azhinova, 2019). However, professional adaptation associated with academic performance, as well as the ability to independently apply knowledge and skills are not sufficient for successful professional performance (Erbaş et al., 2021). Therefore, universities search for new forms of education that improve the quality of applied training and, consequently, increase adaptation abilities.

From our point of view professional adaptation is an adaptation to the content, conditions and nature of a specific professional activity through the educational process. At the same time, professional adaptation involves the norms and functions of future professional activity.

S. Korovin (2018) defines professional adaptation as a way to get used to the content and order of work, as well as to its requirements and relationships in the work team. This definition includes skills acquisition, the development of essential qualities and a positive view of the chosen profession. This long-term and complex process is determined by the need to disagree with the usual, the inevitability of overcoming numerous and diverse adaptation issues and professional difficulties associated with professional mobility and professional improvement.

According to A. Zakharova et al. (2018), professional adaptation to the content of work, as a natural result of professional education in its various forms, is of utmost importance for students with disabilities.

Eganov, A. et al (2020) indicate that the current transformations of education in the Russian Federation do not facilitate the development of recommendations for applied education at the scientific level due to the following reasons: the use of distance learning, the increased number of both educational programs and universities, a two-level educational system, multidisciplinary universities.

L.G. Talaghir et al. (2018) note that despite the place of professionally applied physical training (PAPT) within the university curriculum as a subsystem of physical education, the limited number of applied PE means is one of the main problems of traditional PE methodology, since it is necessary to ensure a systematic and adequate performance model, which meets the essential requirements of professional activities.

E. Osipenko (2019) writes that a comprehensive preparation for professional activity by means of professionally applied physical training among students with disabilities is used only for therapeutic purposes due to poor physical fitness, health limitations and individual academic schedule. Therefore, it creates problems for the academic staff of the educational institution. As a result, students with disabilities are not sufficiently prepared to fulfill professional tasks.

Moreover, according to statistics, of more than 60 thousand residents of the total number of working age people with disabilities in the region today, only about 22% have a job. This indicates that a significant number of people with disabilities remains unemployed, which is both unethical and not rational from an economic point of view.

However, I. Shapoval (2019) states that at university the majority of such students is not involved in applied physical training due to health problems, which requires the expansion of activities of educational organizations in terms of the acquisition and use of high-quality knowledge and skills for successful professional performance in compliance with physical fitness.

From our point of view (D. Viktorov, 2021) and with respect to the curricula developed on the basis of the Federal State Educational Standard of Higher Education (3+) or the Federal State Educational Standard of Higher Education (3++), the qualitative improvement of applied physical training in the last semester resulted in adaptation improvement. This is due to a combination of specific and non-specific means and types of physical activities and applied physical training. At the same time, applied physical training is a new stage in the holistic concept of physical education and a structural and functional model, which improves adaptation among students of different health groups due to adaptation to physical activity that is not associated with specific professional functions.

O. Safonova and V. Krivoshchekov (2015) associate the importance of this problem at the social level with the rapid development of civilization, educational and production technologies, a significant acceleration of life, and a noticeable decrease in the role of physical work. At the same time, it turns hypokinesia and physical inactivity into emotional and mental distress, reduces the performance of adaptive mechanisms of a person.

L. Kodaneva, E. Ketlerova (2020) note that the problem of students with disabilities should be considered at the pedagogical level and requires the involvement of educational institutions for developing required competencies of students, while applied training should ensure the adaptation of students through educational activities.

However, according to N. Chekaleva (2017), students' health status remains the main strategic problem of education, and the number of students with health limitations is increasing, as well as the number of students in special medical groups.

Materials and methods

Our hypothesis implies the use of the means and methods of physical education, which are characteristic of professional and applied training of students with disabilities and continuous professional-applied education (when such students demonstrate sufficient adaptation levels).

Our study involved students of South Ural State University. All students were divided into 2 groups: control (CG, n = 15) and experimental (EG, n = 15). The sample included 3 male and 4 female students with musculoskeletal diseases, 3 male and 2 female students with myopia or visual disturbances, 2 students (male and female) with hearing loss, 7 male and 5 female students with diseases of the internal organs, 2 male and 2 female students with diabetes. The mean age of the subjects was 19 years.

The status of the leading regional university of higher education allows to make conclusions about the state of applied physical training both in the region and in other subjects of the Russian Federation similar in terms of socio-economic conditions.

The purpose of our study was to identify the effect of pedagogical activities on applied physical training in university students with disabilities.

At present, professionally applied physical training is a necessary means since changes should occur at the level of professional education. Professionally applied physical training performs the same functions that are characteristic of physical education in general and deals with the transfer of motor and physical skills regardless of major field study.

The following concepts are used for the purpose of the study (Fig. 1).

Concept	Its association with applied physical training
Baseline data	Poor functional performance of students with disabilities, which affects skills acquisition.
Research problem	Improvement of functional performance by means of applied physical training.
Idea	The use of pedagogical principles to applied physical training, which imply a systematic, comprehensive, and applied approach along with the accessibility and integrity of education. This allows developing a conceptual model of applied physical training and improving functional performance of students.
Expected result	Adaptation to future professional activity due to knowledge acquisition and skill implementation.

Fig. 1. The system of research activities

The continuity of applied physical training was ensured by the development of adaptation to future professional activities within the following phases: acute adaptation followed by a long-term one, which consists in changing body structures as a result of accumulated acute and stable adaptation (Fig. 2).

2 semester	4 semester	6 semester
Acute adaptation	Long-term adaptation	Stable adaptation
Mobilization of the functional systems	Improvement of the balance function	Motor activity (power)

Fig. 2. Experimental methodology of applied physical training

The continuity of applied physical training was reflected within the following model: first year students (2nd semester) - acute adaptation to applied physical training (basic knowledge of professionally applied physical training, general motor skills, special motor skills, sports-specific skills), second year students (semester 4) - long-term adaptation as a result of accumulated acute adaptation, which leads to a new quality in a certain type of activity (special motor skills), third year students (semester 6) - stable adaptation with increased resistance to unfavorable conditions, which is the basis for the prevention, treatment and rehabilitation of different diseases.

Evaluation of applied physical training was performed using the criteria that characterized the improvement of functional performance as a) low, b) average and c) high.

Results

During acute adaptation, applied physical education was associated with specific health limitations and performed to acquire general knowledge about applied training and its advantages that may be necessary for future professional activities and can be achieved through regular physical exercise. Therefore, correctly selected and regular physical training contributes to the reduction of the negative professional influences and increases knowledge about occupational diseases. The following functional tests were used at this stage: the Serkin test and the Martinet-Kushelevsky test.

Long-term adaptation, which requires specific physical qualities, was focused on skill development to the professionally required level. This is implemented through the independent choice of sports activities. Therefore, applied physical training has its own specifics and is associated with health limitations. At this stage, force platform measurements were used, namely the Romberg test.

Stable adaptation is associated with the major field of a student. At the same time, applied physical training is sports-specific and is recognized by researchers as the most effective mechanism of physical education (Cherepov, 2016). At this stage, PWC170 and MOC measurements were performed for the purpose of the study.

At all stages, the means of applied physical training are used for the development of both basic and specific physical qualities. These means/exercises include certain movements that directly affect some motor skills. The means of applied physical training are used with respect to the principle of a positive transfer of physical qualities, when the development of one quality simultaneously affects the others. At the same time, it makes sense to use the different patterns of positive transfer, such as unidirectional, direct, indirect, etc.

In general, it is incorrect to consider applied training as a classical type of physical education. If the main purpose of physical education is to achieve a comprehensive and harmonious development of physical skills, then the main idea of professionally applied physical training is to ensure high professional performance. Therefore, when it comes to applied training there is no need to always achieve a comprehensive or maximum development of physical skills as far as applied training takes into account professional specifics.

The following data were obtained in the course of the study.

Table

The improvement of functional performance in the course of the study

Parameter	Group	Acute adaptation		
		2018-2019	2019-2020	2020-2021
Martinet test	EG/CG	41-61/43-57 (p>0.05)	64-36/61-39 (p<0.05)	74-26/69-31 (p<0.05)
Serkin Test	EG/CG	46.3-86.7/46.7-91.9 (p>0.05)	48.2-97.5/48-103.1 (p<0.05)	59.5-103.4/64.6-116.4 (p<0.05)
Ellipse area (mm ²)	Group	Long-term adaptation		
		2018-2019	2019-2020	2020-2021
	EG/CG	235.1/237.5 (p>0.05)	205.9/229.1 (p>0.05)	173.2/231.72 (p<0.05)
Balance	EG/CG	64.42/65.63 (p>0.05)	76.71/68.62 (p>0.05)	85.08/73.32 (p<0.05)
PWC170 relative	Group	Stable adaptation		
		2018-2019	2019-2020	2020-2021
	EG/CG	12.9±1.2/13.1±1.1 (p>0.05)	14.4±1.4/14.2±1.4 (p>0.05)	16.7±0.5/14.8±1.3 (p<0.05)
VO ₂ max relative	EG/CG	31.9±2.1/31.8±1.8 (p>0.05)	37.1±1.7/35.6±2.3 (p>0.05)	42.2±0.7/37.6±2.5 (p<0.05)

Conclusions

The analysis of the results obtained allows us to identify the logic of the program and group its content within two areas: the basic one, which involves the foundations of applied physical education, and the variable one, which takes into account each student, his/her motives, interests, needs, as well as the traditions and resources of the educational institution.

The average group results of the Serkin test show that regardless of gender and physical fitness there was an increase in adaptation adequate to physical activity. This substantiates the effectiveness of this approach towards professional adaptation and serves as a proof of increased adaptation ($p < 0.05$). In the EG, this means that students involved in applied physical training develop their motor skills in accordance with the functional performance of the body systems.

Force platform measurements in EG show the economy of energy by the end of the 3rd academic year ($p < 0.05$) and reflect the changes of the functional system in new conditions.

The PWC170 test shows that at the beginning of the study the results of both EG and CG were at a low level, then, by the fourth semester the results of EG were above the average level ($p < 0.05$).

Similarly, VO₂max levels were the following during the study: 2nd semester, EG and CG - very low; 4th semester, EG - low, CG - below average ($p > 0.05$), 6th semester, EG - average, CG - below average ($p < 0.05$).

Moreover, the training sessions themselves were based on the wide use of theoretical knowledge, methodological skills, and various means of applied physical training. Their orientation is associated with physical activity, the optimal level of physical and functional fitness, individual physical development, functional and motor performance, professional skills, and psychophysical qualities.

In our understanding, the methodology of applied physical training should be updated within a stage-by-stage transformation of applied training, its development through both quantitative and qualitative changes while preserving the foundations. Thus, applied physical training create prerequisites for professional success and must be used in higher education institutions to increase adaptation levels among students with disabilities.

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