MODERN TECHNOLOGY OF PHYSICAL EDUCATION OF DISABLED STUDENTS IN CONDITIONS OF INCLUSIVE EDUCATION

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Abstract. There is a problem of physical education of disabled students during period of their study in higher educational establishments. Insufficiency of this problem’s studying conditioned fulfillment of research of perfection of physical education and sports system. Purpose: substantiation of physical education pedagogic technology for disabled students. Material: in experiment students with following nosologies participated: hearing, eyesight, muscular-skeletal apparatus, after effects of cerebral palsy, somatic diseases and diabetes. In total 664 students of 18-24 years’ age took part in experiment. They were 337 boys and 307 girls. Results: we have worked out organizational-methodic algorithm, which permits to combine theoretical, scientific-methodic and practical training. Its basis is current information about students’ psychic-physiological condition. We determined levels of health and physical condition, physical workability and physical fitness as well as psychic state of students. Demand in optimization of students’ motor functioning during all period of study was substantiated as well as effective means of physical education and pulse regimes, considering peculiarities of nosologies. Students’ orientation on sport style of life was formed. Conclusions: implementation of physical education pedagogic technology for students with different nosologies in the process of their studying stipulates solution of training, health-related and educational tasks. It is possible through creation of conditions for motor actions’ training and intensification of motor functioning during all period of study. Practical application of the technology and received results points at integration of disabled students in students’ medium.

Key words: technology, students, physical, nosologies, functioning, studying, inclusion.

Introduction

Equal rights of disabled people imply that every individual has equal opportunities for participation in life of society. It is mentioned in Standard regulations of ensuring equal rights for disabled. Disabled people shall be supported in acquiring education, in employment. Quality education is one of conditions of their integration in society. Research of modern labor market showed that among disabled, graduated from HEEs have by 80% more opportunities to find work than people without higher education [2, 8, 13, 21]. As usual integration is understood as learning of disabled together with healthy people. Common opinion is that in process of integration disabled person accept existing standards; observe them and becomes equal to other. Nut for this purpose he (she) shall spend much efforts and time for adaptation to strange environment [8, 16].

There is another form – inclusion. It admits change of existing standards and style of healthy people. In this case the main idea is that every person has right to be individual. He (she) shall study in usual educational medium, by usual curriculum, on equal with other students. For this purpose he (she) is included in common educational process; in ordinary regime, and provided with all required equipment and provisioning [10, 13]. Inclusion means change of society and its institutes so that they should facilitate inclusion of different people (other race, other religion, culture, disabled people, people with different social status and etc.). It facilitates interests of all members of society, increase of their ability for independent life, ensuring their equal rights and so on. One of the most important components of social and psychic adaptation study of disabled students in higher educational establishment is physical health and physical fitness. That is why attitude of young people with different nosologies to physical education and sports functioning is one of the most important social-pedagogic problems of the present time. Physical education is the only discipline, in which respect of man to own body, training of motor abilities, acquiring of necessary knowledge, understanding of demand in systemic physical exercises’ trainings are focused. Such approach is the basis for strengthening of self-confidence, self-assessment; formation of positive motivation for healthy life style [6, 9, 11, 14, 17-20].

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Purpose, tasks of the work, material and methods

The purpose of the research is substantiation of physical education pedagogic technology for disabled students in conditions of inclusive education, as well as formation, on this basis, directions of further physical education and sports functioning perfection (structure and content) of youth with different nosologies in compliance with their defects and diseases, demands and interests, conditions of future functioning.

In the research 644 students of 2nd and 3rd disability groups participated. They were 337 boys and 307 girls. All they were students of University “Ukraine”.

Results of the researches

We registered 43 indicators, which characterized physical condition, physical health, physical workability, physical fitness and psychic status of students.

Motor functioning of students with different nosologies (eyesight, hearing, and muscular-skeletal apparatus, after effects of cerebral palsy, somatic diseases and diabetes) was assessed with the help of indicators and tests. These tests show motor potentials in dynamic of pedagogic process, corrected by us in experimental group. In the basis of methodic of motor actions’ and increase of students’ motor activity we put didactic rules. The system of complexes of exercises was divided in three stages of complexity: the easiest; moderate difficulty and the most difficult. Every stage had general algorithm of action: individual approach to health related physical exercises’ practicing. Such approach expressed in differentiation if trainings, means and norms of physical loads. Min criterion of assessment was increment of indicators for every student with certain nosology. Criteria also included every day fulfillment of physical exercises, gradual increase of volume and intensity of loads, transition from one stage to other. Besides, we considered acquiring of knowledge, abilities and skills, which can be applied in practice. With it decisive importance had systemic repetitions of earlier mastered exercises. Thus, complexity of motor tasks increased with every stage, with planning of optimal quantity of movements’ repetitions. In figs. 1, 2 we present the received dynamic of physical health and physical fitness integral indicators of disabled students (boys and girls) before pedagogic experiment.

Fig.1. Physical health level of disabled students before pedagogic experiment (L.G. Apanasenko).

Legend: R – physical health level; sum of points 3 and less – low level, 4-6 points – below average, 7-11 points – average level, 12-15 points – above average, 16-18 points- high level; 1 – eyesight; 2 – hearing; 3 – muscular-skeletal apparatus (MSA); 4 – cerebral palsy (CP); 5 – somatic diseases (SD); 6 – diabetes (D); A - students; B – girls-

The received results show (see fig. 3) that students with eyesight, muscular-skeletal apparatus and cerebral palsy after-effects; somatic diseases and diabetes defects have physical health level below average (4.4 conv.un. – in boys with cerebral palsy after-effects; 5.0 conv.un. – in students with somatic diseases; 5.3 conv.un. in students with
diabetes; students with muscular-skeletal apparatus defects approach to average level – 5.8 conv.un.). Students with hearing defects have average level of physical health (7.6 conv.un.). Indicators of girl-students with different nosologies do not differ significantly. Girl-students with hearing defects and diabetes have average level (8.5 conv.un.) and (6.2 conv.un.) respectively. Girl-students with other defects are at level below average.

**Fig.2.** Output level of physical fitness of students with different nosologies (T.Yu. Krutsevych).

Legend: R – physical health level; 45-5 high level; 35-44 – above average level; 24-34 points – average level; 15-24 below average level; 10-14 points – low level. 1 – eyesight; 2 – hearing; 3 – muscular-skeletal apparatus (MSA); 4 – cerebral palsy (CP); 5 – somatic diseases (SD); 6 – diabetes (D); 7 – control group (CG); A – students; B – girl-students.

It is known that for unification of tests and their maximal integration in European system, in Ukraine State system, of tests and assessment standards for physical fitness of population was worked out. In this system separate part is devoted to students. The worked out set of tests included exercises, which permit to assess development of all five physical (motor) qualities of an individual: endurance, strength, quickness, coordination (dexterity) and flexibility. Taken together they give adequate picture of student’s physical fitness.

Pedagogic testing of disabled students’ physical fitness was fulfilled as per State system of tests and assessment standards for healthy students. It is connected with the fact that there is no such system especially for disabled students. Output results of disabled students’ physical fitness showed that differences between students with different nosologies in most of indicators were absent (P>0.05) (see fig.2).

Significant differences in physical skills’ level were found only between students with hearing defects and students with eyesight defects. In first category physical fitness level corresponded to average; in latter category – to low level.

Students with after-effects of cerebral palsy had physical fitness characteristics of below average level. With it 70% of standard tests they could not fulfill. Boys with defects of eyesight, muscular-skeletal apparatus and cerebral palsy after-effects had low level of physical fitness (especially students with cerebral palsy after-effects). Their motor qualities could be assessed only by four tests: for strength, dexterity, flexibility and ability to swim (their points were respectively 10, 10 i 4). Students with hearing problems had average level of motor fitness, which were assessed by all tests". Excellent” marks were received in tests for dexterity and ability to swim. Sum of points was 30. Nearly average level (24 points) was reached by students with somatic diseases. Students with diabetes had 16 points. It corresponds level below average. Disabled girl students had a little better physical fitness, comparing with boys. For example girl-students with hearing defects had 34 points. All tests they fulfilled with mark “good”. Girls with somatic
diseases and diabetes also were on average level – 20 and 26 points respectively. Girl students with muscular-skeletal apparatus defects and cerebral palsy after effects had results below average (19 and 15 points respectively). Girl students with cerebral palsy after-effects could not fulfill tests for endurance and strength. The received results of disabled students’ physical health and physical fitness during all period of their study witness that by most of tested indicators there are positive shifts from year to year. It is connected with implementation of new scientific methodic content of training and organizational patterns fro disabled students. Results of comparative analysis witness, that programs of trainings with application of different innovative means and forms of physical education influence on the tested indicators. These programs were corrected by us in compliance with students’ nosologies. Significant positive shifts took place at different level of percentage in students with eyesight, hearing, muscular-skeletal defects and cerebral palsy after-effects; with somatic diseases and diabetes (see table 1).

**Table 1.** Comparative characteristic of influence of new physical education technology on physical health and physical fitness of students after pedagogic experiment (% from initial level).

<table>
<thead>
<tr>
<th>Indicators of physical health and physical fitness</th>
<th>Students – girl students by different nosologies</th>
<th>Eyesight</th>
<th>Hearing</th>
<th>MSA</th>
<th>CP</th>
<th>Somatic diseases</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical health, points</strong></td>
<td></td>
<td>58.31/68.18</td>
<td>24.78/18.22</td>
<td>85.11/60.44</td>
<td>41.34/36.34</td>
<td>82.51/69.03</td>
<td>67.07/57.44</td>
</tr>
<tr>
<td>3000 m run, min....sec.</td>
<td>24.82/15.28</td>
<td>5.86/8.33</td>
<td>10.28/21.40</td>
<td>-</td>
<td>15.67/14.32</td>
<td>49.87/79.31</td>
<td></td>
</tr>
<tr>
<td>3000 m run, min....min.</td>
<td>24.34/20.33</td>
<td>50.6/-54.34/-</td>
<td>-</td>
<td>68.05/-73.68/-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pressing ups in lying position, times</strong></td>
<td>53.88/79.41</td>
<td>24.18/62.17</td>
<td>35.76/67.82</td>
<td>23.72/37.33</td>
<td>26.09/37.27</td>
<td>29.51/38.65</td>
<td></td>
</tr>
<tr>
<td><strong>Rising torso in sitting position from lying one during 1 minute, times</strong></td>
<td>42.80/24.34</td>
<td>17.63/34.79</td>
<td>42.80/41.15</td>
<td>-</td>
<td>36.96/57.91</td>
<td>37.18/45.70</td>
<td></td>
</tr>
<tr>
<td><strong>Long jump from the spot, cm</strong></td>
<td>11.83/12.91</td>
<td>9.45/4.59</td>
<td>10.78/9.16</td>
<td>-</td>
<td>12.25/13.63</td>
<td>16.65/13.09</td>
<td></td>
</tr>
<tr>
<td><strong>Hanging on bent arms, sec.</strong></td>
<td>63.38/39.81</td>
<td>52.90/3.53</td>
<td>24.75/57.54</td>
<td>23.56/47.74</td>
<td>20.93/24.03</td>
<td>14.29/91.51</td>
<td></td>
</tr>
<tr>
<td><strong>Chin ups, times</strong></td>
<td>61.26/7.61</td>
<td>7.61/4.66</td>
<td>-</td>
<td>-</td>
<td>11.41/11.34</td>
<td>4.86/10.15</td>
<td></td>
</tr>
<tr>
<td><strong>Forward bending of torso in sitting position, cm</strong></td>
<td>49.07/25.73</td>
<td>25.78/27.84</td>
<td>100/59.04</td>
<td>85.91/46.31</td>
<td>31.35/18.73</td>
<td>74.83/23.18</td>
<td></td>
</tr>
<tr>
<td><strong>Swimming, meters</strong></td>
<td>10.63/12.50</td>
<td>22.32/12.50</td>
<td>6.17/5.01</td>
<td>16.82/26.06</td>
<td>31.00/19.59</td>
<td>56.36/25.97</td>
<td></td>
</tr>
</tbody>
</table>

The corrected by us process of physical education of disabled students resulted in significant positive effects in health condition and in mastering of knowledge about physical culture and sports; in different motor actions.

**Discussion**

When working out technology of physical education for disabled students we considered results of scientific researches of domestic and foreign specialists concerning means and methods of physical education and sports trainings, forms of training and stages of motor activity’s formation of disabled person [7, 12, 14-16, 22-25]. We regard out approach to be timely in connection with peculiarities of direction of the research and contingent of the tested.

When working out technology of physical education for disabled students we considered solution of educational, health related and training tasks as well as demand in implementation of health related technologies and innovative programs with compulsory observation of conditional and health related training principles in physical culture practice. It should be added that trainings shall comply with different nosologies of students and cause their interest in physical functioning and demand in it. Various forms and kinds of physical exercises’ practicing and sports...
functioning ensured the following: prophylaxis of hyperkinesias and physical inactivity at the account of increase of vitally important volume of movements and loads; widening of respiratory and cardio-vascular systems’ reserve potentials; rising of organism’s general resistance to different diseases. Implementation of individual system of every disabled student’s assessment facilitated increase of motivation for practical trainings and receiving higher mark in accessible for them motor test. Distinctions in health levels, physical workability and physical fitness preconditioned differentiated approach implementation in determination of optimal physical loads. With it we considered specificities of nosologies in process of adaptation to systemic physical exercises’ trainings and sport functioning. Analysis of own researches’ results showed that health related physical culture activity gradually acquires status of objective demand for disabled students. It is connected with the fact that students feel positive shifts in their health, psycho-physical state and physical fitness. These changes to large extent depend on content and form of physical education for students with different nosologies.

Analysis of special literature data (philosophic, sociological, the data from general and special pedagogic, humanistic psychology, culture, valueology, anatomy, normal and pathologic physiology, general psychology, morphology, genetic and other) permits to mark out conceptual principles, which the most important for formation of disabled personality; his (her) spiritual and physical development, socialization and integration in society [2, 7, 11, 12, 17, 18]. The most significant for disabled people and for formation of theory and practice of students’ with different nosologies physical education are starting conceptual principles, which are components of Conception of HEEs development “Open international University of human development “Ukraine”. Besides, it concerns all structural departments of University “Ukraine”, which realize physical education of students with different nosologies. The main directions of physical education and sports functioning of disabled students are the following:

- Increase of physical education quality;
- Formation of motivation and demand in health improvement in disabled students by means of physical education and sports functioning;
- Innovative provisioning of physical education technology;
- Physical culture education – formation of system of knowledge about physical culture and sports;
- Adequate volume of motor functioning in compliance with psycho-physiological demands, defects and diseases;
- Involvement in systemic physical education and sports trainings;
- Health related physical culture and rehabilitation work, oriented on embedding of principles of physical and spiritual health and rehabilitation of lost functions;
- Development of sports movement among disabled students;
- Facilitating Para-Olympic kinds of sports and active participation in international Para-Olympic movement;
- Formation and cultivation of skills and habits of personal hygiene and healthy life style;
- Mastering of control and self-control skills over organism’s functional state in process of physical exercises’ fulfillment;
- Creation of scientific-methodic center of physical rehabilitation and recreation;
- For conduct of physical training-education process of disabled students we stipulated:
  - Creation of preconditions for training of motor actions during all period of study at HEE;
  - Availability of practical experience;
  - Variable content of trainings and methodic of their conduct, considering students’ nosologies and current condition of their health;
  - Formation of skills and habits of main and applied motor actions;
  - Optimal influence of physical exercises on development of motor qualities, considering students’ defects and diseases;
  - Improvement of psychic disabled students’ state and physical fitness;
  - Mental readiness for mastering of motor action;
  - Organization of health protection medium in HEE.

Technology of disabled students’ physical education is a purposeful pedagogic process of physical education and sports functioning, which includes effective means, methods and methodic techniques. They are adapted to
students’ nosologies. Such adaptation influences on their health, physical workability, physical fitness and psychic status. All these facilitate development of professional skills and abilities. Our researches prove that increase of disabled students’ motor functioning at lessons of physical education is a complex multisided process. In this process laws of general and special character act. This process was realized on the base of definite principles, rules, scientific and methodic principles of physical culture.

Physical education-training process is the basis of students’ physical development, physical workability and physical fitness. It determines the character and content of all motor functioning. Formation of disabled students’ health in HEE conditions was realized stage by stage:

1 year – training of movements and formation of motor functioning’s general level;
2 year – training of movements and organizational-pedagogic approaches to stimulation of motor functioning;
3 year - training of movements and realization of integrative forms of motor functioning intensification;
4 year - training of movements and formation of motor functioning of students with different nosologies.

Application of physical education technology for disabled students results in the following:
- rising of health level and understanding of own organism’s potentials;
- formation of firm motivation and demand in systemic independent practicing of physical exercises of different orientation;
- formation of physical culture of disabled youth;
- involvement in healthy life style and preparation for conditions of life activity;
- correspondence to requirements of educational-qualification characteristic of the chosen profession;
- promotion of self-determination, self-realization in health related physical culture and sports functioning and in profession;
- activation of students’ scientific-research work.

The offered by us technology of physical education for disabled students has a number of advantages: it completely considers earlier fragmentary works, fulfilled by scientists, devoted to physical training of disabled youth [1, 2, 8, 12, 15]; it is adapted to specific features of disabled students’ psycho-physical condition. The technology is adapted to the existing in Ukraine normative base. We have formulated orientation and content of health related physical culture and sports provisioning of disabled students’ training.

Conclusions:
1. Results of pedagogic experiment, their implementation in HEEs’ educational process permit to say that application of physical education technology for disabled students helps to find the most effective way to health improvement by means of physical culture and sports; to intensification of motor functioning and cultivation of healthy life style. With it, it is necessary to consider that traditional means and methods for healthy students are not always suitable for disabled students. Variability of motor actions, demands, motives, aims of their mastering and usage; presence of great number of individual features of disabled youth make doubtful working out of single theory of motor actions’ training.
2. We have experimentally tested directions of students’ health improvement and their physical fitness and motor functioning’s rising. It is facilitated by:
- application of different means;
- application of differentiated approach to physical loads;
- application of functional potentials and current health condition; students’ interests.

Results of pedagogic testing prove integration of disabled students in students’ environment. The offered forms of physical education classes’ and sports training organization have so great reserves of integration, which do not exist in any educational activity. Common existence brings the following use:
- in healthy students kindness, mercy, care are awakened and cultivated;
- in disabled students – trust, sense of security and thankfulness.

Disabled students feel themselves more comfortably than in a circle of their own kind (they morally equalize). Their attitude to own personality change: to perception of environment, to masking defects, to self-presentation.

Conflict of interests
The author declares that there is no conflict of interests.
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