

The Optimization of Physical Fitness of Students With Poor Health

Nelya Alekseevna Korbukova, Evgenia Gennadyevna Podkopayeva,
Anatoly Aleksandrovich Serdyukov, Natalia Nikolaevna Karelina
and Ivan Viktorovich Shelegin

Moscow State University of Food Production, 125080, Moscow, Volokolamsk Highway, 11, Russia.

DOI: <http://dx.doi.org/10.13005/bbra/1650>

(Received: 14 December 2014; accepted: 22 January 2015)

This article is designed for teachers and students of technical universities in all areas and specialties, of full-time training, Bachelor qualification, who study the academic discipline physical culture. The article describes the method of estimating the physical fitness of students with poor health, and improving the quality of higher vocational education in the discipline of physical culture.

Key words: The assessment of physical fitness of the students, health, improving the quality of education.

Mankind has entered the world of global information and educational environment that places high demands on the conditions and quality of specialists training. One of the challenges of the high school is to teach the future specialist to adapt to the changing work conditions, to constantly update his professional knowledge, to overestimate the stereotypes. For this we need to create an innovative learning technology, which would ensure the formation of a creative approach to business.

In the past, the number and profile of training graduates of institutions of higher education, and even the jobs offered to them were planned and approved by the administrative authorities. Today the opportunities and conditions of employment are determined and dictated by the market demand for personnel. This, in turn, led to a change in many positions in the qualified characterization and in the educational standard of students who study at the Department of Physical Culture and Sports.

METHOD

To improve and enhance the effectiveness of the training of specialists in high school on the basis of modern educational technology, in the first place factors such as the following are important:

- a) The motivation of the students to the systematic process of study and self-education, the desire to achieve the highest readiness for professional work;
- b) The encouraging of active creative efforts of the students in mastering the profession by the administration and teachers;
- c) The intensification of training by increasing the pedagogic art and the efforts of the teachers, and the implementation of active forms of learning.

It should be noted that the use of pedagogic technology is possible with objective prerequisites, which include: the clarity of the purpose, reflected in the bulk, control-test and attestative requirements; the publicity of the purpose and the conditions of activity; understanding and clarity of the situation and the rules of interaction between the participants of the didactic process; discipline, primarily educational and productive, based on positive motivation;

* To whom all correspondence should be addressed.

parametric evaluation of the progress; positive social attention and stimulation; a familiar informational field; the conditions of the game; social protection of the student from the negative unfair external pressure, controlling morphological¹ and anthropometric^{2,3,4} features of the student, which are an important part of life⁵.

RESULTS

One of the methods of improving and enhancing the effectiveness of training specialists in high school is offered by the Department of Physical culture and Sports, it offers methodical computer⁶ products in the assessment of physical fitness of the students who are recommended to limit the physical activity in a special medical department.

Students who have diseases with a temporary or permanent aberration in health, which is not an obstacle to studying in an educational

institution and for profession mastering, but at the same time which require limiting of physical activities, are put in a special medical department.

A special group is given in case of a disease with a stable disease stage. It is characterized by the absence of exacerbations and exacerbation threats because of stress, there are no signs of severe functional impairment of the diseased organ or system, there are only some clinical signs of the disease, and a good overall health, there is no subjective complaints, but there is a good body response to physical activity, achieved through practicing medical physical culture, etc.

The main problems to be solved in the special medical department are focused on:

- a) The formation of professionally important properties and individual qualities, through various means of physical culture, taking into account the features of the student's body. Attracting the student to the All-

Table 1. Self-control

	1 course		2course		3 course	
	1 semester	2semester	3 semester	4 semester	5 semester	6 semester
Subjective indicators						
1. State of health						
2. Mood						
3. Slumber						
4. Appetite						
bjective indicators						
1. Body weight						
2. Power indicators of the hand (left, right)						
3. Flexibility of the spine						
Health indicators						
1. Heart rate (1)						
2. Respiratory rate						
3. Blood pressure						
Functional state						
1. C-C sample (P2)						
2.(P2- P1)/ P1× E 100%						
3. Stange Sample (inspiratory)						
4. Genchi sample (expiratory)						
5. Test for coordination						
Testing						
1. Cooper test						
2. Long jump from place						
3. Push-ups						
4. Prelum abdominal						
Date of the examination						
signature						

- Russian sports complex⁷.
- b) Proper nutrition for the student during university studies^{8, 9}.
 - c) Health promotion, hardening of the body and increasing the level of physical performance, control of anthropometry in the health passport⁴.
 - d) Quality control of the student's learning through innovative processes^{10, 11}.
 - e) Elimination of functional abnormalities and deficiencies in physical development;
 - f) The use of psychological preparation of the students¹².
 - g) The formation of knowledge and skills of self-control, self-massage, skills of independent use of exercises in the organization of motion mode, taking into account the health status¹³.
- As a result of long-term integrated observations of well-being of students in the performance of limited physical activities and on the basis of the analysis of health data obtained on methodological and practical lessons called "self-control" (Table 1), where the parameters of the functional state of the student's cardiovascular system are calculated (20 sit-ups in 30 seconds.) by the formula $(P2 - P1) / P1 \times 100\%$, where P1- pulse at rest, P2- pulse after exercise, and a conclusion is made on the adequacy or inadequacy of the body's reaction to the stress (the body's response to the

Table 2. Determining the degree of health (J. Vainbaum)

Criteria	Degree	Points
weight	Ideal (deviation $\pm 5\%$)	0
	An excess of 5-25%	1
	An excess of 25%	2
Cooper test	Excellent	0
	Satisfactorily	1
	Unsatisfactorily	2
capacity for work and morbidity	Active (without sleep disorders, resistant to cold, rarely sick)	0
	Capacity for work is medium, becomes sick 2-3 times a year in average, resistance to cold is not uniform.	1
	Capacity for work is low, becomes tired quickly, often becomes sick, not resistant to cold organism.	2

Table 3. An assessment of physical performance of different age groups as a result of the 12-minute K. Cooper test in running

Evaluation of physical fitness	Distance (km) passed in 12 minutes						
	Age (years)						
	13-19	20-29	30-39	40-49	50-59	60 and older	
	1	2	3	4	5	6	7
	men						
Very bad	less than 2,1	Less than 1,95	Less than 1,9	Less than 1,8	Less than 1,65	Less than 1,4	
Bad	2,1-2,2	1,95-2,1	1,9-2,1	1,8-2,0	1,65-1,85	1,4-1,6	
Satisfactorily	2,2-2,5	2,1-2,4	2,1-2,3	2,0-2,2	1,85-2,1	1,6-1,9	
Good	2,5-2,75	2,4-2,6	2,3-2,5	2,2-2,45	2,1-2,3	1,9-2,1	
Excellent	2,75-3,0	2,6-2,8	2,5-2,7	2,45-2,6	2,3-2,5	2,1-2,4	
	women						
Very bad	Less than 1,6	Less than 1,55	Less than 1,5	Less than 1,4	Less than 1,35	Less than 1,25	
Bad	1,6-1,9	1,55-1,8	1,5-1,7	1,4-1,6	1,35-1,5	1,25-1,3	
Satisfactorily	1,9-2,1	1,8-1,9	1,7-1,9	1,6-1,8	1,5-1,7	1,4-1,55	
Good	2,1-2,3	1,9-2,1	1,9-2,0	1,8-2,0	1,7-1,9	1,6-1,7	
Excellent	2,3-2,4	2,15-2,3	2,0-2,2	2,0-2,1	1,9-2,0	1,75-1,9	

stress is characterized by the following: up to 25% - an excellent response; up to 50% - a good reaction; up to 70% - a satisfactory response and above 70% - unsatisfactory (inadequate) response), as well as in monitoring the dynamics of the level of physical fitness of the students of the special medical department, we have been developed and validated test indices, which are recommended for implementation by the students in the special medical department (Table 4).

The most important physical quality is the overall endurance, which allows carrying out long-term work intensively with the participation of more than half of the body's muscles. There is a table of three degrees health (table 2):

- 1 degree - not more than 1 (no additional recommendations)
- 2 degree - 2 points (specialist consultation)
- 2 degree - 0 (extensive medical examination)

K. Cooper test

Test of physical fitness of the human body was created by an American doctor Kenneth Cooper in 1968 for the US Army. The test is a 12-minute run: the passed distance is fixed, and according to these data conclusions are made in sports or medical purposes. Kenneth Cooper has created more than 30 such tests, but exactly this is widely used in professional sports and sports medicine.

Test of overcoming the distance in 12 minutes of running indicates aerobic fitness of the student¹⁴ Cooper revealed that in 12 minute running

the man overcomes a distance which is proportional to the maximum oxygen consumption. Therefore, in Table 3 by inserting the passed distance, we know the oxygen consumption by the student during the performed work, and therefore, we give the characteristic of physical fitness. In physically unprepared students oxygen consumption varies from 25 ml / min / kg to 42.5 ml / min / kg, if the values exceed this level it is safe to say that the physical condition is good (Table 3)

Cooper test is a system that determines the possibility of consumption of the IPC, which gives the right to evaluate the health and functionality, using a 12 minute cyclic stress.

Speaking about the merits of his test, Kenneth Cooper, among others, mentions the following:

Test results of the test are motivations for physical exercises

Observations on the dynamics and performance of the tests for a period equal to one test in 4-6 months will be a good stimulus for further studies. Improving health is of interest and is a stimulus to new "tops" of health and development.

Test helps to determine the risk of heart diseases.

As we already said, the basis of Cooper tests is physical exercises, providing enough requirements to the cardiovascular system. Therefore, if the body copes well with such stresses, we can talk about good functional state of the cardiovascular system and its high resistance to diseases. On the contrary, the body

Table 4. Tests of physical training of the students of special medical department

Tests points	Cooper test		Long jump from place		power exercises (not taking time into account)			
					Arm bending in lying support		Lifting the torso	
	M	W	M	W	M	W	M	W
10	2200	2700	205	245	30	40	50	55
9	2100	2600	200	240	28	35	45	50
8	2000	2500	195	230	26	31	40	45
7	1900	2400	190	220	23	29	35	40
6	1800	2300	185	210	20	26	30	35
5	1700	2200	180	200	17	23	25	30
4	1600	2100	175	190	14	20	20	25
3	1500	1900	170	180	11	17	15	20
2	1400	1700	165	175	9	14	10	15
1	1200	1500	160	170	5	10	5	10

that does not cope with these stresses has a weakened, not trained cardiovascular system, which is exposed to the emergence of various pathologies. Healthy people can carry out Cooper tests by themselves.

Test. Long jump from place

The testing exercise is performed in three attempts on a flat, non-slip surface. The best jump is counted as the final measure of the test. This test determines the explosive leg strength of the student.

Test. Arm bending in lying support

The testing exercise is performed in lying support on the floor for the boys and on gymnastic benches for the girls: flexion-extension of arms without regard to time. The dynamic force of arms and shoulder girdle is determined.

Test. trunk curl, to sitting position (press)

The test is performed on a gymnastic exercise mat lying on the back, hands behind head - lifting the trunk without taking into account the time. The dynamic force of abdominal muscles and back muscles is determined.

Summary

According to the data obtained from the testing exercises (Table 4) and visiting the practical (theoretical) classes, we calculate the rank of the student of the special medical department, and this is a stimulating factor for developing the physical fitness and the desire to get the highest score, and therefore the highest result.

REFERENCES

1. Podkopaeva, E.G., Korbukova, N.A., Vladimirov, O.V. & Serdyukov, A.A., Research methods of anthropometric self control of Bachelor students of all disciplines (p.112-115). A collection of scientific articles, Fundamental and applied research, development and application of high technology in economy, project management, pedagogy, law, cultural studies, linguistics, nature, biology, zoology, chemistry, political science, psychology, medicine, philology, philosophy, sociology, mathematics, engineering, physics, computer science, city of St. Petersburg.: Publishing house "KultInformPress", 2014
2. Podkopaeva, E.G. & Korbukova, N.A., The relevance of anthropometric studies in Bachelor students of all disciplines. 21st Century: basic science and technology (pp.105-116). Proceedings of the III International scientific-practical conference, Moscow, 2014.
3. Korbukova, N. A., Budnikova, I. A., Karelina N. N., Shelegin I. V., Shupeyko R. V., Podkopaeva, E. G., Serdyukov, A. A. & Tarasov, A.V., The technology of using individual health passport at the bachelors in the discipline of physical culture (pp.48-65). Collective monograph on medicine. Theoretical and practical aspects of psychology and pedagogy. Ufa, LLC "Aeterna", 2014.
4. Korbukova, N.A., Podkopaeva, E.G. & Serdyukov, A.A., Harmonious physical development of the student and the use of anthropometric studies in the educational process (pp. 44-47). III International Scientific and Practical Conference. 33 TOPICAL PROBLEMS OF PSYCHOLOGY AND PEDAGOGY: a collection of articles of the International Scientific and Practical Conference. Ufa: Aeterna, 2014.
5. Korbukova, N.A. & Podkopaeva, E.G., Computer technologies in the educational process of the higher school (pp. 96-104). Academic science - problems and achievements. Proceedings of the III International scientific-practical conference, Moscow, 2014.
6. Korbukova, N.A., Using a nationwide sports complex in the educational process of higher school and interactive learning technologies in the quality control of the discipline physical culture. Scientific Journal Collection of scientific works of SWorld, «Scientific researches and their practical application, 2013; 3(25): 100.
7. Korbukova, N.A., Podkopayeva, E.G., Serdyukov, A.A., Budnikova, I.A. & Soltan, N.P. Quality of food of students and formation of culture of food in the studenchekey environment **scopus**. American-Eurasian Journal of Sustainable Agriculture ISSN: 1995-0748 AEJSA, 2014; 8(6): 49-51.
8. Korbukova, N.A. & Podkopaeva, E.G., Technologies and products of healthy food in forming the culture of the student. Scientific journal "Perspectives of science" WAC number 2013; 3(42): 19-23.
9. Korbukova, N. A., Innovative quality control processes in the educational process of higher school. International scientific-practical conference Innovative processes of modernity. Ufa: RIO MTSII OMEGA Sayns 2014.
10. Budnikova, I.A., An innovative approach to controlling the physical fitness of the students. *A collection of scientific works of World*, 2013; 4(55), 29-33.
11. Korbukova, N.A., Podkopaeva, E.G. &

- Serdyukov, A.A., Using auto-training and psychological preparation for competitions between students -athletes. III International Scientific and Practical Conference. 33 topical problems of psychology and pedagogy: a collection of articles of the International Scientific and Practical Conference. Ufa: Aeterna, 2014.
12. Mikhailov, V.M., Soltan, N.P., Shelegin, I.V. & Shupeyko, R.V., Controlling the physical fitness of the students of I-IV courses MGUPP (Full-time). Modern science collection: current problems and their solutions. Proceedings of the VII International Scientific distance Conference, 2014.
13. Budnikova, I.A. & Karelina, N.N., The effect of aerobic exercise complex on the state of the cardiovascular system of female students of I-II courses. A collection of scientific works of SWorld, 2013; **3**(52): 65-71.