

IMPROVEMENT OF PHYSICAL FITNESS OF TRANSPORT COLLEGE STUDENTS THROUGH RUNNING

Stanislav Galandzovskii¹, Alla Sulyma¹, Anatolii Korolchuk¹

¹ Mikhail Kotsiubynsky Vinnitsa State Pedagogical University, Vinnitsa, Ukraine, stanislav@galandzovsky.pro

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Abstracts

Aim of the research was to study the influence of running exercises in the aerobic regime of energy supply on the indicators of transport college students' physical preparedness. **Methods.** In the course of research, theoretical analysis and generalization of data of scientific and methodological literature, physical fitness tests, methods of mathematical statistics were used. The research was conducted in September 2015 – April 2016, based on the Vinnitsa State Pedagogical University named after Mikhail Kotsiubynsky. The study involved 44 students of the Vinnitsa Transport College of the male sex. Students were divided into two groups of control and main groups. Influence of a 24-week program with running exercises in the aerobic regime of energy supply was studied. Effectiveness of exercises using aerobic exercise in aerobic exercise was studied by their ability to influence the physical fitness of students at the Transport College. It was established that «The curriculum for physical education for higher education institutions of I-II accreditation level» does not lead to the likely positive changes in the physical preparedness of the students of the transport college. **Conclusions.** Introduction of running exercises in the aerobic regime of energy supply in the classes of transport college students three times a week improves their general endurance, speed endurance and speed-strength endurance; strength dynamic endurance of lower limb muscles as well as strength static endurance of back muscles, gluteus muscles and posterior thigh. After 24 weeks of classes with running exercises in the aerobic regime of energy supply the students showed a possible increase in the values of general endurance (by 4,35 %), speed endurance (by 3,73 %), strength dynamic endurance of lower limb muscles (by 8,27 %) and static endurance of back muscles, gluteus muscles and posterior thigh (by 5,39 %) ($p < 0,05$).

Key words: students, physical preparedness, transport college.

Станіслав Галандзовський, Алла Сулима, Анатолій Корольчук. Покращення показників фізичної підготовленості в студентів транспортного коледжу шляхом використання бігових навантажень. **Мета роботи** – дослідження впливу бігових навантажень в аеробному режимі енергозабезпечення на показники фізичної підготовленості студентів транспортного коледжу. **Методи дослідження.** У праці використовували теоретичний аналіз й узагальнення даних науково-методичної літератури, тестування фізичної підготовленості, методи математичної статистики. Дослідження проводили у вересні 2015 – квітні 2016 р. на базі Вінницького державного педагогічного університету імені Михайла Коцюбинського. У дослідженні брали участь 44 студенти Вінницького транспортного коледжу чоловічої статі. Студентів розділили на дві групи – контрольну та основну. Досліджено вплив 24-тижневої програми з використанням бігових навантажень в аеробному режимі енергозабезпечення. Ефективність занять із використанням бігових навантажень в аеробному режимі енергозабезпечення вивчали за їх здатністю впливати на фізичну підготовленість студентів транспортного коледжу. Установлено, що «Навчальна програма з фізичного виховання для вищих навчальних закладів I–II рівня акредитації» не спричиняє вірогідних позитивних змін фізичної підготовленості студентів транспортного коледжу. **Висновки.** Застосування у фізичному вихованні студентів транспортного коледжу занять періодичністю три рази на тиждень, які включають бігові навантаження в аеробному режимі енергозабезпечення, покращують показники загальної, швидкісної й швидкісно-силової витривалості; силової динамічної витривалості м'язів ніг; силової статичної витривалості м'язів спини, сідничних м'язів і м'язів задньої поверхні стегна. Під впливом занять, у яких використовували бігові навантаження в аеробному режимі енергозабезпечення, через 24 тижні у студентів достовірно зросли загальна витривалість (на 4,35 %), швидкісна витривалість (на 3,73 %), силова динамічна витривалість м'язів ніг (на 8,27 %) і статична витривалість м'язів спини, сідничних м'язів та м'язів задньої поверхні стегна (на 5,39 %) ($p < 0,05$).

Ключові слова: студенти, фізична підготовленість, транспортний коледж.

Станислав Галандзовський, Алла Сулима, Анатолий Корольчук. Улучшение показателей физической подготовленности студентов транспортного колледжа путем использования беговых нагрузок. **Цель работы** – исследование влияния беговых нагрузок в аэробном режиме энергообеспечения на показатели физической подготовленности студентов транспортного колледжа. **Методы исследования.** В научной разведке

использовали теоретический анализ и обобщение данных научно-методической литературы, тестирование физической подготовленности, методы математической статистики. Исследование проводили в сентябре 2015 – апреле 2016 на базе Винницкого государственного педагогического университета имени Михаила Коцюбинского. В исследовании участвовали 44 студента мужского пола Винницкого транспортного колледжа. Студентов разделили на две группы – контрольную и основную. Исследовали влияние 24-недельной программы с использованием беговых нагрузок в аэробном режиме энергообеспечения. Эффективность занятий с использованием беговых нагрузок в аэробном режиме энергообеспечения изучали по их способности влиять на физическую подготовленность студентов транспортного колледжа. Установлено, что «Учебная программа по физическому воспитанию для высших учебных заведений I–II уровней аккредитации» не вызывает достоверных положительных изменений физической подготовленности студентов транспортного колледжа. **Выводы.** Применение в физическом воспитании студентов транспортного колледжа занятий периодичностью три раза в неделю, включающих беговые нагрузки в аэробном режиме энергообеспечения, улучшают показатели общей, скоростной и скоростно-силовой выносливости; силовой динамической выносливости мышц ног; силовой статической выносливости мышц спины, ягодичных мышц и мышц задней поверхности бедра. Под влиянием занятий, в которых использовались беговые нагрузки в аэробном режиме энергообеспечения, через 24 недели у студентов достоверно увеличились общая выносливость (на 4,35 %), скоростная выносливость (на 3,73 %), силовая динамическая выносливость мышц ног (на 8,27 %) и статическая выносливость мышц спины, ягодичных мышц и мышц задней поверхности бедра (на 5,39 %) ($p < 0,05$).

Ключевые слова: студенты, физическая подготовленность, транспортный колледж.

A problem statement. Analysis of recent research and publications. Much attention to addressing different problems in physical education of students of working specialties is paid in both domestic and foreign literature. It is explained by the fact that there are some disagreements between the aims of physical education, physical fitness of youth and real needs of students of working specialties [1].

Particularly, traditional methods and means of physical education have a special place in educational programs of physical training for students of different professional training directions. In addition, real students' needs connected with entering their future profession are not taken into consideration [1; 2]

Analysis of students' physical indicators over the last years demonstrates insufficient level of adaptive abilities, which is blamed on the lack of motor activity. High schools of I-II accreditation studying is getting more difficult in content as well as form; at the beginning of studies most students experience social problems, among which adaptation to the studying process plays a significant role [1; 3]. Intensification of academic process as well as financial need to combine studying and work has a negative influence on adaptive abilities. Therefore, there must be reforms through introduction of new studying models and technologies, improvement of educational plans as well as programs, evaluation criteria in the educational system of high schools, which prepare different working specialists [4].

Analysis of scientific methodical literature points out that the problem of adaptation of students in high schools of I-II accreditation to the studying process is hugely highlighted, in addition, the number of scientific publications on this topic is limited, and the existing facts are controversial [1; 4]

A special feature of transport college students' adaptation to the studying process is that a student needs to learn both humanitarian subjects and special subjects of vocational orientation [4; 5].

Adaptation to the special subjects of vocational orientation requires of students to increase their level of physical and functional preparedness in the process of studying, performing hard physical work in the aerobic and anaerobic regimes of energy supply. In order to enhance aerobic processes of energy supply, physical exercises different in content and form, as well as methodologies encouraging improvement of adaptation are used. The results of scientific researches show that doing running exercises positively influences on physical and functional preparedness of different age groups [6; 7; 8; 9].

Ways of developing adaptive abilities of transport college students in the course of studying are not examined enough. Thus, this research is topical aiming at improving the effectiveness of transport college students' physical preparedness.

Aim of the research is to study the influence of running exercises in the aerobic regime of energy supply on the indicators of transport college students' physical preparedness.

Task objects are:

1. To study general transport college students' physical preparedness according to the test results;
2. To evaluate the results of influence of running exercise program on the indicators of physical preparedness.

Research organization. The research was conducted in September 2015-April 2016 in the Vinnytsia State Pedagogical University named after Mykhailo Kotsiubynskii. It involved 44 male students of the Vinnytsia transport college. The students were divided into 2 groups – a control group (CG) and a main group (MG), including 22 boys each.

Research methods: theoretical analysis and generalisation of scientific-methodical literature, examination of physical preparedness, methods of mathematic statistics.

In order to ensure comprehensive examination of physical preparedness we studied: speed based on the results of 30-metre dash after walking; speed endurance based on the results of 100-metre dash; general endurance based on the results of 3000-meter run; strength static endurance of back muscles, gluteus muscles, and posterior thigh through holding until refusing while lying on the belly (parachutist position); strength dynamic endurance of shoulder girdle muscles and lower limbs while pulling up on a pull-up bar and squatting without a rack; speed-strength endurance through bent-knee sit-ups in 1 min from the position of lying on the back arms behind the head ; bending muscle strength of fingers through hand-held dynamometry; explosion power through standing long jumps; agility through 4x9 m shuttle-run test; active flexibility through ability to do seated forward bends. For this purpose we used tests on «Studying Program of Physical Education For High Schools Of I-II Accreditation» [10], supplemented with tests to define speed, bending muscle strength of fingers, gluteus muscles and posterior thigh, strength dynamic endurance of lower limbs.

Research results: The effectiveness of running exercises in the aerobic regime of energy supply was studied in terms of their ability to influence on transport college students' physical preparedness.

Mean values of physical preparedness recorded before exercising in CG and MG students didn't differ significantly ($p>0,05$).

Classes conducted according to the typical program of physical education during the whole forming experiment (24 weeks) didn't cause significant changes in general physical preparedness of CG students. (See Table 1).

Table 1

Influence of classes with running exercises in the aerobic regime of energy supply on physical preparedness of CG students aged 15-16 (n=22)

Tests	Mean value, $\bar{x}\pm S$			
	before exercising	after 8 weeks	after 16 weeks	after 24 weeks
30 m run with standing start, sec	5,05±0,09	5,01±0,09	4,95±0,09	4,9±0,09
100 m run, sec	16,08±0,25	15,96±0,25	15,9±0,25	15,85±0,25
3000 m run, min	15,36±0,11	15,35±0,11	15,34±0,11	15,35±0,11
4x9 shuttle run test m, sec	10,36±0,09	10,31±0,1	10,29±0,1	10,27±0,1
Hand-held dynamometry, kg	44,41±1,66	45,00±1,43	45,41±1,37	45,45±1,14
Standing long jump, cm	202,73±3,83	202,91±3,71	203,23±3,66	203,55±3,77
Bent-knee sit-ups in 1 min from the position of lying on the back arms behind the head, times	35,68±1,49	35,68±1,54	35,91±1,54	36,00±1,66
Active flexibility, cm	7,64±0,74	7,73±0,74	7,73±0,86	7,68±0,86
Pull-ups, times	8±0,69	8,27±0,69	8,36±0,8	8,55±0,86
Squats, times	73,82±2,17	74,05±1,94	74,41±2	74,36±1,94
Holding until refusing while lying on the belly (parachutist position), sec	55,55±1,03	56,41±1,03	56,41±1,09	56,86±1,09

No significant changes were noticed in the general physical preparedness of MG students after 16 weeks of doing running exercises in the aerobic regime of energy supply. But there was a clear tendency for improvement of speed endurance, general endurance and speed-strength endurance, that was absent at MG students (See Table 2).

Influence of classes with running exercises in the aerobic regime of energy supply on physical preparedness of MG students aged 15–16 (n=22)

Tests	Mean value, $\bar{x} \pm S$			
	before exercising	after 8 weeks	after 16 weeks	after 24 weeks
30 m run with standing start, sec	5,28±0,02	5,25±0,02	5,24±0,02	5,23±0,02
100 m run, sec	15,58±0,16	15,34±0,19	15,14±0,19	15,02±0,19*
3000 m run, min	15,23±0,13	15,14±0,13	14,57±0,14	14,44±0,14*
4x9 shuttle run test m, sec	10,45±0,1	10,43±0,1	10,43±0,1	10,21±0,16
Hand-held dynamometry, kg	49,59±1,2	50,82±1,14	50,59±1,03	50,09±0,91
Standing long jump, cm	207±3,66	207,27±3,71	207,55±3,71	207,82±3,77
Bent-knee sit-ups in 1 min from the position of lying on the back arms behind the head, times	33,64±1,54	34,55±1,43	36,41±1,37	38,45±1,43*
Active flexibility, cm	7,77±0,74	8,18±0,8	7,82±0,86	7,82±0,86
Pull-ups, times	7,95±0,46	8,32±0,46	8,55±0,46	8,36±0,46
Squats, times	75,55±2,46	77±2,4	78,64±2,34	82,36±2,29*
Holding until refusing while lying on the belly (parachutist position), sec	57,41±0,97	58,05±1,03	58,59±1,03	60,68±0,97*

Notes. Possible difference in the value compared to the value recorded at the beginning of the forming experiment: * – $p < 0,05$.

The research showed that MG students' time of 100 m run after 24 weeks of doing running exercises in the aerobic regime of energy supply decreased by 3,73% ($p < 0,05$). After 24 weeks of running exercises in the aerobic regime of energy supply general endurance of MG students possibly increased by 4,35%. In addition, after the forming research, strength dynamic endurance of leg muscles and strength static endurance of back muscles, gluteus muscles and posterior thigh possibly increased by 8,27% and 5,39% ($p < 0,05$) accordingly (See Table 1.2).

Conclusions.

1. Analysis of scientific-methodical literature proves introduction of new technologies in the process of practical-professional physical preparedness of transport college students with the purpose of improving professionally significant physical traits, working skills as well as skills of future railway specialists to be relevant.

2. Usage of running exercises in the aerobic regime of energy supply during the training session of transport college students encourages improving their effectiveness which is shown through the possible increase in the values of general endurance, strength dynamic endurance of lower limb muscles as well as strength static endurance of back muscles, gluteus muscles and posterior thigh.

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