УДК 796.431.4
ББК 75
DOI 10.47475/2500-0365-2022-17416

TECHNICAL TRAINING OF POLE VAULTERS IN THE PREPARATORY PERIOD

I.F. Cherkasov, S.A. Aitkulov, M.M. Stepanova

South Ural State Humanitarian Pedagogical University, Chelyabinsk, Russia

The following article considers the issue of improving the effectiveness of the methodology of pole-vaulters techniqie training during the preparation period of the work-out sessions. The research results before and at the end of the experiment on special physical and technical fitness of pole-vaulters are analysed. The complex of special applied gymnastics influencing the effectiveness of the developed technique is determined.

The main means of special physical training of pole-vaulters in the experimental group were physical exercises based on applied gymnastics that increased the indicators' growth of technical and speed-power training of sportsmen.

Keywords .*Pole-jumping, physical qualities, training methods, gymnastic exercises, special physical training.*

Revelance. Pole-jumping is a type of track and field athletics consisting of both cyclic and acyclic elements and is difficult to perform and while training young athletes. High requirements are imposed on an athlete: he/she must have a high coordination abilities and also speed and strength qualities. Along with well physical condition, a pole-vaulter needs to have a high level of motivation and the mobilisation ability.

Currently growing popularity of pole-jumping and stiff reqiurements applicable to results in modern sports call for finding new approaches to the training process, optimize the technique of performing this jump. V. V. Mansvetov, B. A. Savinykh, A. P. Nazarov, V. A. Gorbunov, S. A. Abramova, D. G. Zakharchuk, V. P. Koshikhin, V. I. Nikonov, Chun-Vum-Chul, M. P. Shestakov devoted their scientific works to this kind of sport. At the same time, these writings do not illuminate the issues of putting out errors and correcting the technique of pole-jumping, gymnastic, strength training of an athlete. Thus, it becomes on the front burner to find ways how to realise modernisation in the methodology of technical training aimed at correcting the technique of pole-jumping meanwhile improving the technical training of an athlete during the preparation period.

Pole-vaulting is equal parts spectacular and complex type of track and field athletics (Fig. 1). Popularity of pole-jumping and stiff reqiurements applicable to sports results arouse active interest among sports researchers and the need to find modern approaches to the training process and optimisation while performing jumps.

A significant factor in achieving high results in pole-jumping lies in technical and physical training of athletes. The growth of sports results in this precise form of athletics forces athletes to come close to achievement the maximum level of development of physical qualities.

For many years, close attention has been paid to the development of optimal types of training and modernization of athletes' training by athletics specialists.

According to the structure, jumps in track and field athletics belong to a mixed type, there are both cyclic and acyclic elements of movement (Fig. 2).

Pole vault is an acyclic speed-power motor action that is performed on a movable bearer under time limit conditions and combines elements of running, jumping and gymnastics. Pole-jumping belongs to the category of vertical jumps that require not only personal jumping and coordination, but also sprinting features. The pole vault differs from other types of jumps significantly in the fact that it is performed with the help of a movable pole support. The jumper performs a significant part of the jump using the pole as a support and only the final part is performed as a free flight.

The technique training of a pole-vaulter is aimed at mastering rational forms of movement, pole-jumping techniques as well as improving them in order to achieve high sports results. The main task of the technical training of pole-vaulters is to teach the basics of jumping techniques and special lead-up exercises. During the process of physical training (general, strength, gymnastic, running, jumping), technical training is always somehow seamless in the development of special and especially preparatory exercises.

The success of pole-jumping training is mostly due to the fact of functional state and the development level of the athlete's physical qualities. The main

Fig 1. Pole-jumpings — spectacular and complex type of track and field athletics

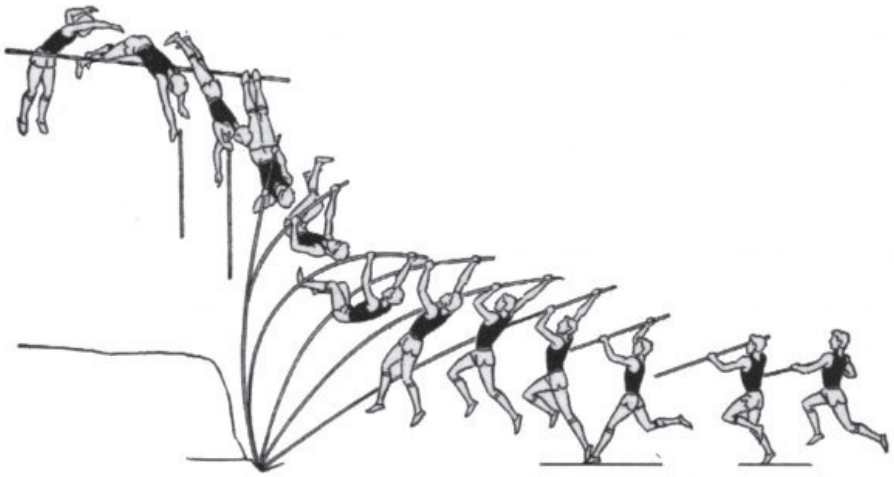

Fig.2. Pole-jumping is an acyclic speed-power motor action that is performed on a movable bearer under the time limit conditions and combines elements of running, jumping and gymnastics

goal of physical training is aimed at increasing the level of functional performance of the jumper and the ability to control their movements, to overcome physical exertion of various tensions. Therefore, in both educational and training process it is necessary to use tools for the development of strength, speed and strength characteristics, jumping, running and gymnastic qualification. The multilateral training of pole-vaulters should be purposeful.

Achieving high results in jumping is possible only if there is a high level of functionality, technical skills and psychological training based on the innate abilities of athletes and developed in the course of many years of training.

The analysis of sports activity confirms that the achievement of high sports results in complex coordination sports is possible with the introduction and use of modern innovative technologies in the process of sports training.

Materials and methods

For the possibility of using special gymnastic exercises and solving specific tasks of specialized pole-vaulter training we organized and conducted a pedagogical experiment. The experiment was carried out on the basis of MBI SCaYSSOR No. 1 in athletics in the period September 2021 to May 2022 in Chelyabinsk.

To implement all the given tasks, jumpers were divided into two 7-persons' groups: control (CG) and experimental (EG). The jumpers who belonged to the experimental group trained according to the method-

ology developed by us using specialized complexes and means of applied gymnastics, and the control group trained according to the generally accepted methodology.

The essence of the pedagogical experiment consisted in the fact that in the preparation period of the annual cycle, specialized complexes were used in the training of jumpers (Table) for the development of physical qualities and complexes using means of applied gymnastics aimed at improving special physical prepareness.

In the process of individual training of pole-vaulters, tasks are being solved to master the rhythm of running in a run-up, with its different length and running speed, a search is carried out for parallel interaction of the athlete's body weight using poles of different weights, elasticity, etc. Indicators of training load, such as the optimal level of combination of volume, intensity and novelty of exercises at various stages of preparation in the annual cycle affect the growth of athletic achievements.

We offer specialized training complexes for pole-vaulters that we personaly used in the experimental group below (Tables 1, 2, 3).

At the beginning of the experiment, the complexity of technical tasks related to performing gymnastic exercises gradually increased gradually . At the end of the experiment, some of the exercises were more difficult and performed in complicated conditions.

An important distinctive component of our methodology was the definition of gymnastic exercises similar in structural features and their transfer from auxiliary exercises to the main competitive action.

Certain structural features of these exercises indicate the purpose of these actions. The relationship of structural bonds between the main competitive exercise pole vault and exercises of sports and applied gymnastics determine the algorithm of application of the technique.

The ability to individualize the training process through the use of different options for building sports training depending on the level of preparedness of pole-vaulters is a positive aspect of the experimental methodology.

The improvement of various phases and technical elements of the pole-jump with the help of a complex of gymnastic training was carried out throughout the whole period of the experiment. More successful solution of the technical tasks was to reach the corresponding requirement of special preparedness with the help of special exercise complexes for the development of the physical abilities of the pole-vaulter.

The analysis of the dynamics of special physical fitness of pole vaulters proves the effectiveness of the proposed experimental technique which was determined by changes in the parameters of special physical fitness at the beginning and end of the experiment.

The following tests were included in the complex of research parameters of special physical pole-vaulter prepareness:

1) Running 30 m from the walking position;

Table 1

Specialized complex № 1

1.	Striking the correct running position: raise your arms up, stretch, take a deep breath, exhale and lower your arms down through the sides bent at the elbows, legs without tension
2.	Fast, slow and uniform performing of exercise of wide circular movements with the hands involving small turns of the shoulder girdle in alternation with dumbbells of 1—3 kg and without weights
3.	Hang on the crossbar with a straight body, stretch out backwards and bend your legs forward, making a grouping, bringing your feet closer to the place of grip, then, unbending your legs, relaxedly roll backwards
4.	Jumping over barriers on two legs, crouching down from the stop, socks on yourself. The distance between the barriers is the same
5.	Sitting with your hands on the back, alternately lifting your right and left legs, knees straight, keep your socks on.
6.	In the hang on the rings on the swing forward, lift both legs up in one fell swoop, keep your socks on yourself, lower your legs back on the swing and make a swing
7.	"Fly in a step» — pushing up with a push leg, holding the knee with a flywheel, continuing running movements three steps, then repeat
8.	Running on the run-up (A) with hitting the control mark in six running steps and the designation of repulsion from the bar (B)
9.	Standing long jumpt with dumbbells (1-2 kg) in your hands. Feet shoulder width apart, make a jump from a half-crouch accompanied by an active and wide swing with straight arms forward — up, in flight, lowering your arms quickly, throw the dumbbells back. Repeat the same exercise with a run of 2 — 6 running steps
10.	Sitting with your hands on the back, lifting and lowering straight legs as well as rotating in a circle in both directions with weights

Table 2

Specialized complex № 2

1.	Squatting, rolling backwards, hands to the ears, perform a somersault backwards, straightening your legs in a stand up, land on your feet (flight and landing when jumping high).
2.	From the position, lying on your back with your hands behind your head and with your knees bent, lifting the body up, straining the hip bone then lowering to the starting position.
3.	Lying on your back with your arms supported along the body, lift your legs up, through the grouping, stand in a stand on the shoulder blades (A). The same with active extension into a handstand, the starting position with the support of the hands behind the head (B).
4.	From the position of the bridge stand on the shoulder blades (on mats), make the body swing, then pushing off with your hands, stand up, bending your knees to go back.
5.	Rope climbing: raise the bent legs to a right angle, do an alternate interception with the hands up to the end, then down, holding the legs. Repeat the same exercise upside down, making a grouping so that the pelvis and legs are above the hands, the head is below.
6.	Climbing a vertical ladder with an interception of hands. Without the legs‘ participation pull up and intercept the hands alternately up the stairs, then down.
7.	Rope climbing from a sitting position without the help of your legs, pull yourself up and intercept with your lower hand up, without unbending your elbows.
8.	While hanging on a horizontal ladder, do an interception with your hands through one crossbar.
9.	From two to four steps of the run—up, jumping from one leg (A) onto the rope — rings followed by pulling up the bent legs to the chest (B) and returning to the swing back in the same position.
10.	Bending — extension of the arms with emphasis on gymnastic bars with weights on the legs.

Table 3

Specialized complex № 3

1.	While hanging on a rope, lifting straight legs with weights.
2.	With a foot swing of in a wide step, make a jump into the hang on the crossbar.
3.	Rope climbing in a hang on one hand, using a swing of the legs with a quick pull-up to facilitate hand intercepts.
4.	From a lying position (on mats) on the back, hands supported on a pole, pulling up the arms with a quick rise of the legs along the pole.
5.	While hanging on the arms on the crossbar, do swinging straight legs forward and backward as high as possible.
6.	From two — four steps of the run-up, push off onto the rope (A), at the extreme front point of the swing, release the rope (B) and continue the flight, bending (C) with landing on mats on two legs (D).
7.	From two steps of the run-up jumping onto the rope with the rise of the hip bone and legs above the grip with your hands.
8.	With a push of two legs jump into a handstand and push back with your hands.
9.	On a vertical ladder from hanging on your hands, make a swing with straight legs as high as possible, then slowly make them lower
10.	From one or two steps (on the mats), jump on your hands with a swing of your legs over your head and get into the starting position.

2) Running 60 m in motion;
3) Barbell snatch;
4) Long jump with a run-up;
5) Triple jump from a place;
6) Pole jump.

Comparison of the obtained test results at the experimental stages allowed us to make an objective conclusion about the degree of effectiveness of the experimental technique in relation to special physical training of pole-vaulters at the stage of improving sports skills.

Comparative results of testing the indicators of special physical training (SPT) of the test persons at the initial stage of the experiment are presented in the Table 4.

An analysis of the table shows that there are small differences in the level of the pole-vaulters' SPT indicators at the specified stage of the experiment. Therefore, the results in running 30 m were 3.25 s among the EG. In the CG they had 3.33 s. The test results are almost equal running 60 m in movement, the results differ in only 0.02 s. In the test the barbell snatch is a difference of 100 gr. The indicators in the long jump test with a run—up in CG were 6 m 1 cm and in EG 6m 9 cm, in the test triple jump from a place in the subjects CG 7 m 86 cm, and EG 3 cm more — 7 m

Table 4

Results of testing the special physical training level among pole-vaulters at the beginning of the experiment (November)

№ n/o	Tests and units of measurement	EG (X ± m)	CG (X ± m)	Reliability of differences between groups	
				t	P
1.	Running 30 m from the walking position, S	3,25 ± 0,03	3,33 ± 0,05	1,38	> 0,05
2.	Running 60 m in motion, S	7,44 ± 0,03	7,42 ± 0,02	0,55	> 0,05
3.	Barbell snatch, KG	41,0 ± 1,54	41,1 ± 1,85	0,04	> 0,05
4.	Long jump with a run-up, CM	607 ± 2,48	602 ± 2,84	1,33	> 0,05
5.	Triple jump from a place, CM	788 ± 2,66	787 ± 2,12	0,86	> 0,05
6.	Pole jump, CM	459 ± 1,08	461 ± 1,57	1,05	> 0,05

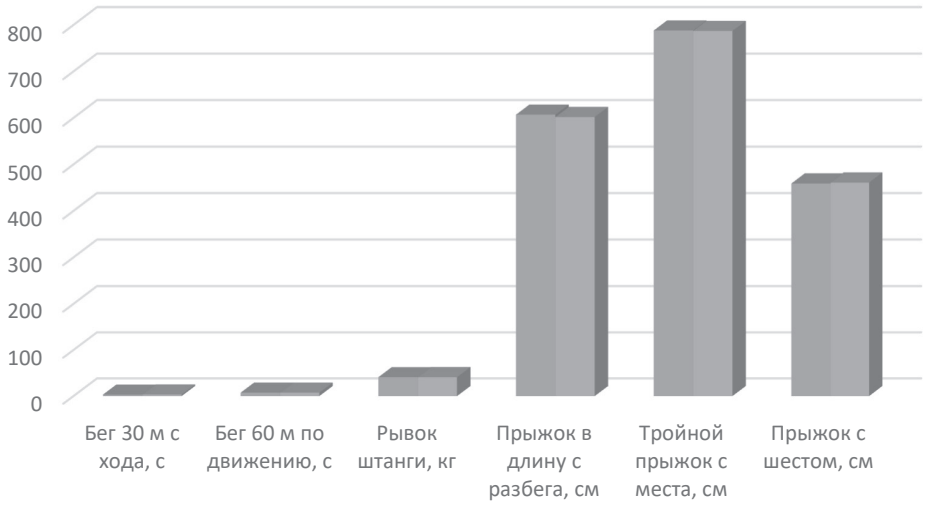

Fig 3. Test results before the experiment (November)

89 cm. In the main exercise, the pole vault of the subjects — CG — 4 m 61 cm, EG — 4m 59 cm.

All these differences do not have a clearly defined character with a confidence level of P > 0.05 indicating the superiority of pole jumpers of a particular group. Thus, it can be claimed that at the initial stage of the experiment the indicators of sports training of the tested persons were approximately at the same level.

More significant differences in the SPT indicators of sportsmen were demonstrated clearly at the final stage of the experiment (April). These data are presented in the Table 5.

Discussion

Analyzing the results of the conducted pedagogical experiment on the basis of MBI SCaYSSOR No. 1 in Chelyabinsk with the introduction of the developed methodology based on the use of specialized means and exercises of applied gymnastics in the educational and training process, this technique has its advantage over the generally accepted ones.

So in the EG an obvious advantage was revealed in the following tests: while running 30 m, an improvement was 0.01 seconds; while running 60 m, an improvement was 0.08 seconds; the long jump from a run—up, an improvement was 1 centimeter; the barbell snatch and an advantage in 3 kg.

Thus, we can confirm that the results of the experimental methodology using the means of applied gymnastics have shown their effectiveness in both educational and training process.

Conclusion

Analyzing the dynamics of indicators' growth of test tasks for special physical and technical training of pole-vaulters during the preparation period, we can come to the following conclusion that this technique has its advantage over the generally accepted one.

At the same time, more dynamic increase in these

Table 5

Results of testing the special physical training level among pole-vaulters at the end of the experiment (April)

№ n/o	Tests and units of measurement	EG (X ± m)	CG (X ± m)	Reliability of differences between groups	
				t	P
1.	Running 30 m from the walking position, S	3,1 ± 0,05	3,2 ± 0,02	2,0	P > 0,05
2.	Running 60 m in motion, S	7,32 ± 0,03	7,40 ± 0,02	2,2	P < 0,05
3.	Barbell snatch, KG	45,5 ± 1,26	42,5 ± 1,54	1,51	P > 0,05
4.	Long jump with a run-up, CM	615 ± 2,14	604 ± 2,42	3,4	P < 0,01
5.	Triple jump from a place, CM	802 ± 2,02	795 ± 2,17	2,36	P < 0,05
6.	Pole jump, CM	468 ± 1,3	464 ± 1,08	2,36	P < 0,05

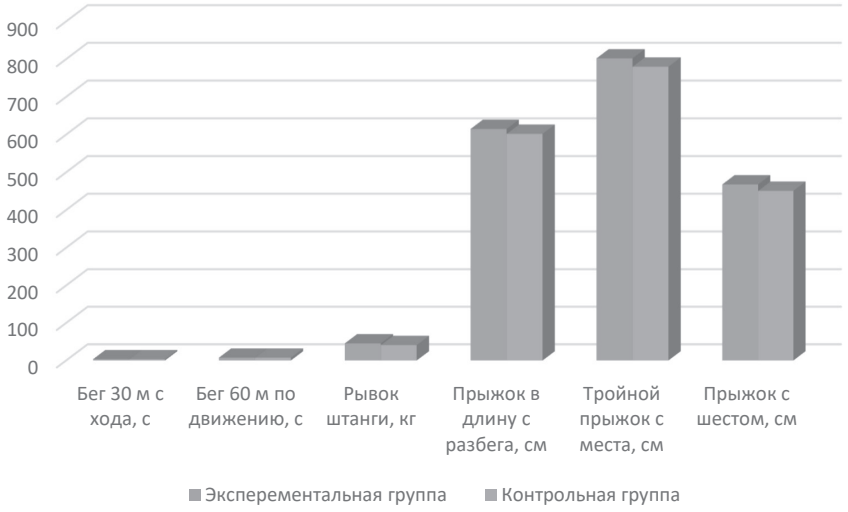

Fig. 4. Test results at the end of experiment (April)

indicators among the EG members suggests that the experimental technique which includes an high volume of specialized exercises and means of applied gymnastics as the main means of SPT is most suitable to the tasks of improving the special physical and technical prepareness of pole-vaulters.

Fundamentals

— on the specialized tests' basis the level of physical and functional prepareness of the tested persons was determined before and at the end of the experiment;
— complexes of specialized exercises based on the means of applied gymnastics for the educational and training process are developed;
— Methods of technical training in the training process of pole-vaulters are developed and implemented.

References

1. Gorbunov V.A. *Sportivno-prikladnaya gimnastika v sisteme specializirovannyh sredstv podgotovki sportsmenov v pryzhkah s shestom* [Sports-applied gymnastics in the system of specialized means of training athletes in pole vaulting]. Omsk, 2001. 144 p. (In Russ.).

2. Deryabina M.A., Segal A.V. Korrekciya tehniki pryzhka s shestom na osnove sochetaniya special-no-podgotovitelnyh uprazhnenij s uprazhneniyami na batute u devushek na etape nachalnoj specializacii [Correction of pole vault technique based on a combination of special preparatory exercises with trampoline exercises for girls at the stage of initial specialization]. *Fizicheskoe vospitanie i sportivnaya trenirovka* [Physical education and sports training], 2019, no. 2 (28), pp. 22—31. (In Russ.).

3. Eganov A.V., Chemerchej O.A. Napravlennost pedagogicheskih vozdejstvij pri raznom urovne

individualnoj vyrazhennosti motornoj dihotomii konechnostej u sportsmenov, zanimayushihsya prikladnymi vidami edinoborstv [The orientation of pedagogical influences at different levels of individual severity of motor dichotomy of limbs in athletes engaged in applied martial arts]. *Sovremennye naukoemkie tehnologii* [Modern high-tech technologies], 2018, no. 2, pp. 137—141. (In Russ.).

4. Kirm M.A. Avtorskoe svidetelstvo № 925352 A1 SSSR, MPK A63B 5/02. Stojka dlya pryzhkov v vysotu s shestom : № 2866009 : zayavl. 07.01.1980: opubl. 07.05.1982 [Copyright certificate no. 925352 A1 USSR, IPC A63B 5/02. Pole vault stand : no. 2866009 : application 07.01.1980 : publ. 07.05.1982]. *zayavitel Detsko-yunosheskaya sportivnaya shkola Vilyandiskogo rajona Estonskoj SSR* [Applicant Children's and Youth Sports School of Viljandi district of the Estonian SSR.].

5. Nazarov A. P. *Postroenie trenirovochnogo processa v pryzhkah s shestom na etapah predvaritelnoj podgotovki i nachalnoj sportivnoj specializacii* [The construction of the training process in pole vaulting at the stages of preliminary preparation and initial sports specialization]. Thesis. Moscow, 1998. 127 p. (In Russ.).

6. Nikonov V.I., Stepanova A.M., Uskov I.V. Specialnaya gibkost kak faktor ovladeniya sovremennoj tehnikoj pryzhka s shestom [Special flexibility as a factor of mastering the modern technique of pole vaulting]. *Mezhdunarodnyj nauchno-issledovatelskij zhurnal* [International Scientific Research Journal], 2022, no. 2-3(116), pp. 96—101. (In Russ.).

7. 1. Bacherikov E.L., Sarajkin D.A., Dyatlov D.A., Kamskova Yu.G Ocenka vestibulyarnoj funkcii v usloviyah sportivnoj deyatelnosti kak harakteristika statokineticheskoj ustojchivosti organizma v funkcionalnoj podgotovlennosti sportsmena [Assessment of vestibular function in conditions of sports activity as a characteristic of the statokinetic stability of the organism in the functional fitness of an athlete]. *Teoriya i praktika fizicheskoj kultury* [Theory and practice of physical culture], 2022, no. 3, pp. 100-102. (In Russ.).

8. Paukov Yu.N., Pravikov N.A., Milovanov V.P. at all. Avtorskoe svidetelstvo № 803943 A1 SSSR, MPK A63B 5/02. Ustrojstvo dlya pryzhkov v vysotu s shestom : № 2745318 : zayavl. 02.04.1979 : opubl. 15.02.1981 [Copyright certificate no. 803943 A1 USSR, IPC A63B 5/02. Device for pole vaulting : no. 2745318 : application 02.04.1979 : publ. 15.02.1981]. *zayavitel Predpriyatie P/Ya V-2645* [applicant Enterprise P/ I V-2645]. (In Russ.).

9. Cherkasov I.F., Ajtkulov S.A., Stepanov K.S., Stepanova M.M. Razvitie bystroty sportsmenok v pryzhkah s shestom na nachalnom etape podgotovki [Development of the speed of athletes in pole vaulting at the initial stage preparation]. *Fizicheskaya kultura. Sport. Turizm. Dvigatelnaya rekreaciya* [Physical culture. Sport. Tourism. Motor recreation] 2020, vol. 5, № 3, pp. 91—94. (In Russ.).

10. Chun-Vum-chul. *Metodika obucheniya tehnike pryzhka s shestom zhenshin na etape nachalnoj specializacii : dis. ... kand. ped. nauk* [Methods of teaching the technique of pole vaulting to women at the stage of initial specialization. Thesis]. Moscow, 2008. 200 p. (In Russ.).

11. Stecyuk T.I., Abramova T.F. Aktualnye problemy etapa nachalnoj podgotovki v pryzhkah s shestom [Actual problems of the initial training stage in pole vaulting]. *Aktualnye problemy sportivnoj podgotovki v legkoj atletike* [Actual problems of sports training in athletics]. Chelyabinsk, 2022. Pp. 26—31. (In Russ.).

12. Shustova E.V., KulishenkoI.V., AShustov A.A. Sovremennye tendencii povysheniya effektivnosti razbega u vysokokvalificirovannyh prygunov v vysotu [Modern trends in increasing the efficiency of the run-up in highly qualified high jumpers]. *Teoriya i praktika fizicheskoj kultury* [Theory and practice of physical culture], 2018, no. 3, pp. 66—68. (In Russ.).

13. Yakushev E.V. Metody fizicheskogo vospitaniya v processe obucheniya zanimayushihsya tehnike dvigatelnyh dejstvij [Methods of physical education in the process of teaching those engaged in the technique of motor actions]. *Fizicheskoe vospitanie i sport: aktualnye voprosy teorii i praktiki. Materialy Vserossijskoj nauchno-prakticheskoj konferencii* [Physical education and sport: topical issues of theory and practice. Materials of the All-Russian Scientific and practical conference]. Rostov-na-Donu, 2018. Pp. 296—299. (In Russ.).

Поступила в редакцию 10 июля 2022 г.

Для цитирования: Cherkasov, I. F. Technical training of pole vaulters in the preparatory period / I. F. Cherkasov, S. A. Aitkulov, M. M. Stepanova // Физическая культура. Спорт. Туризм. Двигательная рекреация. — 2022. — Т. 7, № 4. — С. 112—120.

Information about the authors

Cherkasov Ivan Fedorovich — Candidate of Pedagogical Sciences, Associate Professor of the Department of Physical Education. South Ural State University of Humanities and Pedagogy. Chelyabinsk, Russian Federation. **ORCID ID:** 0000-0001-5357-5455. E-mail: *cherkasovif@cspu.ru*

Aitkulov Sait Akhmetkanovich — Candidate of Pedagogical Sciences, Associate Professor of the Department of Physical Education. South Ural State University of Humanities and Pedagogy. Chelyabinsk, Russian Federation. ORCID ID:0000-0002-6137-19 E-mail: *fitkulovsa@cspu.ru*

Stepanova Maryam Maratovna — senior lecturer of the Department of Physical Education. South Ural State University of Humanities and Pedagogy. Chelyabinsk, Russian Federation. ORCID ID: 0000-0001-5169-7723. E-mail: *stepanovamm@cspu.ru*

PHYSICAL CULTURE.SPORT.TOURISM. MOTOR RECREATION
2022, vol. 7, no. 4, pp. 112—120.

Техническая подготовка прыгунов с шестом в подготовительный период

Черкасов И. Ф., Айткулов С. А., Степанова М. М.

[1] Южно-Уральский государственный гуманитарно-педагогический университет, Челябинск, Российская Федерация. cherkasovif@cspu.ru
[2] Южно-Уральский государственный гуманитарно-педагогический университет, Челябинск, Российская Федерация. fitkulovsa@cspu.ru
[3] Южно-Уральский государственный гуманитарно-педагогический университет, Челябинск, Российская Федерация. stepanovamm@cspu.ru

В статье рассматривается вопрос повышения эффективности методики специальной технической подготовки прыгунов с шестом в подготовительный период тренировочного процесса. Проанализированы результаты исследования до начала и в конце эксперимента по специальной физической и технической подготовленности у прыгунов с шестом. Определён комплекс специальной прикладной гимнастики, влияющий на эффективность разработанной методики.

Основными средствами специальной физической подготовки прыгунов с шестом в экспериментальной группе составили физические упражнения на основе прикладной гимнастики, которые увеличили прирост показателей технической и скоростно-силовой подготовки прыгунов.

Ключевые слова: *прыжки с шестом, физические качества, методика тренировки, гимнастические упражнения, специальная физическая подготовка.*

Список литературы

1. Горбунов, В. А. Спортивно-прикладная гимнастика в системе специализированных средств подготовки спортсменов в прыжках с шестом :дис. … канд.пед. наук / В. А. Горбунов. — Омск, 2001. — 144 с.

2. Дерябина, М. А. Коррекция техники прыжка с шестом на основе сочетания специально-подготовительных упражнений с упражнениями на батуте у девушек на этапе начальной специализации / М. А. Дерябина, И. В. Сегал // Физическое воспитание и спортивная тренировка. — 2019. — № 2(28). — С. 22—31.

3. Еганов, А. В. Направленность педагогических воздействий при разном уровне индивидуальной выраженности моторной дихотомии конечностей у спортсменов, занимающихся прикладными видами единоборств / А. В. Еганов, О. А. Чемерчей // Современные наукоемкие технологии. — 2018. — № 2. — С. 137—141.

4. Кирм, М. А. Авторское свидетельство № 925352 A1 СССР, МПК A63B 5/02. Стойка для прыжков в высоту с шестом : № 2866009 : заявл. 07.01.1980 : опубл. 07.05.1982 / М. А. Кирм ; заявитель Детско-юношеская спортивная школа Вильяндиского района Эстонской ССР.

5. Назаров, А. П. Построение тренировочного процесса в прыжках с шестом на этапах предварительной подготовки и начальной спортивной специализации :дис. … канд. пед. наук / А. П. Назаров. — М., 1998. — 127 с.

6. Никонов, В. И. Специальная гибкость как фактор овладения современной техникой прыжка с шестом / В. И. Никонов, А. М. Степанова, И. В. Усков // Международный научно-исследовательский журнал. — 2022. — № 2-3(116). — С. 96—101.

7. Оценка вестибулярной функции в условиях спортивной деятельности как характеристика статокинетической устойчивости организма в функциональной подготовленности спортсмена / Е. Л. Бачериков, Д. А. Сарайкин, Д. А. Дятлов, Ю. Г. Камскова // Теория и практика физической культуры. — 2022. — № 3.— С. 100—102.

8. Пауков, Ю. Н. Авторское свидетельство № 803943 А1 СССР, МПК А63В 5/02. Устройство для прыжков в высоту с шестом : № 2745318 : заявл. 02.04.1979 : опубл. 15.02.1981 / Ю. Н. Пауков, Н. А. Правиков, В. П. Милованов [и др.]; заявитель ПредприятиеП/Я В-2645.

9. Развитие быстроты спортсменок в прыжках с шестом на начальном этапе подготовки / И. Ф. Черкасов, С. А. Айткулов, К. С. Степанов, М. М. Степанова // Физическая культура. Спорт. Туризм. Двигательная рекреация. — 2020. — Т. 5,№ 3. С. 91—94.

10. Чун-Вум-чул. Методика обучения технике прыжка с шестом женщин на этапе начальной специализации :дис.… канд.пед. наук / Чун-Вум-чул. — М., 2008. — 200 с.

11. Стецюк, Т. И. Актуальные проблемы этапа начальной подготовки в прыжках с шестом / Т. И. Стецюк, Т. Ф. Абрамова // Актуальные проблемы спортивной подготовки в легкой атлетике : сб. материалов верос. науч.-метод. конференциис междунар. участием, посвященной 50-летию кафедры теории и методики легкой атлетики Уральского государственного университета физической культуры, Челябинск, 24 марта 2022 года. — Челябинск: Уральский государственный университет физической культуры, 2022. — С. 26—31.

12. Шустова, Е. В. Современные тенденции повышения эффективности разбегау высококвалифицированных прыгунов в высоту / Е. В. Шустова, И. В. Кулишенко, А. А. Шустов // Теория и практика физической культуры. — 2018. — № 3. — С. 66—68.

13. Якушев, Э. В. Методы физического воспитания в процессеобучения занимающихся технике двигательных действий / Э. В. Якушев // Физическое воспитание и спорт: актуальные вопросы теории и практики.Материалы Всероссийской научно-практической конференции. — Ростов н/Д. : РЮИ МВД, 2018. — С. 296—299.

Сведения об авторах

Черкасов Иван Фёдорович — кандидат педагогических наук, доцент кафедры физического воспитания. Южно-Уральский государственный гуманитарно-педагогический университет. Челябинск, Российская Федерация.**ORCIDID:**0000-0001-5357-5455**E-mail:** cherkasovif@cspu.ru

Айткулов Саит Ахметканович —кандидат педагогических наук, доцент кафедры физического воспитания. Южно-Уральский государственный гуманитарно-педагогический университет. Челябинск, Российская Федерация.**ORCIDID:**0000-0002-6137-1919**E-mail:** aitkulovsa@cspu.ru

Степанова Марьям Маратовна — старший преподаватель кафедры физического воспитания. Южно-Уральский государственный гуманитарно-педагогический университет. Челябинск, Российская Федерация.**ORCIDID:**0000-0001-5169-7723**E-mail:**stepanovamm@cspu.ru

Финансирование. Исследование не имело спонсорской поддержки.

Конфликт интересов. Авторы заявляют об отсутствии конфликта интересов.