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THE INFLUENCE OF RUNNING TECHNIQUE IN RACING ATHLETICS ON SPORTS RESULTS

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Abstract:
This article presents the results of a pedagogical study on studying the influence of the level of technical preparedness of short-distance runners on sports results. In it, the ways of identifying and eliminating errors and shortcomings made by short-distance runners were shown, and attention was paid to revealing on the histogram the frequency of hand movement steps in running technique, the length and number of steps, running cadence, the dynamics of results when running every 10 meters of a 100-meter distance, and the degree of influence on sports results.

Keywords: Short-distance running, running technique, step frequency, number and length, running cadence, athletes, sports results and mistakes

Introduction

YENGIL ATLETIKANING YUGURISH TURLARIDA YUGURISH TEXNIKASINING SPORT NATIJALARGI TA'SIRI

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O'zbekiston davlat jismoniy tarbiya va sport universiteti,
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Annotatsiya:
Ushbu maqolada qisqa masofalarga yuguruvchilarni texnik tayyorgarlik darajasini sport natijalariga ta'sirini o'rganish bo'yicha olib borilgan pedagogik tadqiqot natijasi bayon etilgan. Unda qisqa masofalarga yuguruvchilar tomonidan yo'l qo'yilgan xato kamchiliklar aniqlash va bartaraf etish yo'llari ko'rsatib o'tilgan bo'lib yugurish texnikasida qo'l harakati qadamlar chastotasi, qadamlar uzunligi va soni, yugurish kadensi, 100 m masofaning har bir 10 metrlik

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bo‘laklarini yugurib o‘tishdagi natijalar dinamikasi va undagi sport natijalariga ta’sir darajasini gistagrammada ochib berishga etibor qaratilgan.

Kalit so‘zlar qisqa masofaga yugurish, yugurish texnikasi, qadamlar chastotasi, soni va uzunligi, yugurish kadensi sportchilar, sport natijalari va xato kamchiliklar

Аннотация:
В данной стате изложены результаты педагогического исследования по изучению влияния уровня технической подготовленности бегунов на короткие дистансии на спортивные результаты. В нем показаны пути выявления и устранения ошибок и недостатков, допущенных бегунами на короткие дистансии, уделено внимание раскрытию на гистограмме частоты шагов движений рук в технике бега, длины и количества шагов, беговой каденсии, динамики результатов при пробеге каждых 10-метровых отрезков дистансии 100 м и степени влияния на спортивные результаты.

Ключевые слова: бег на короткие дистансии, техника бега, частота, количество и длина шагов, беговая каденсия, спортсмены, спортивные результаты и ошибки

In short-distance running, the running technique is considered a technical factor that seriously affects the athlete's result, as the frequency of steps, the length of steps and the cadence of running, as well as the movement of the hands, and the running technique is the main factor in the athlete's effective running and economical energy consumption. Because the running technique forms a whole body movement. In this case, the movement of the hands and feet makes it possible to perform coordinated movements with each other, ensuring the effectiveness of the athlete's running technique.
In short-distance running events, the athlete's effectiveness is directly related to his running technique, and sometimes there are athletes with different techniques among the runners. Therefore, first of all, teaching them the correct execution of the running technique is determined as the main task of the training.

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In the studies conducted by us during the pedagogical experience, it was found that there are athletes who run by grossly violating the running technique. Especially in short-distance running, there were cases of student athletes making mistakes and shortcomings in the start, start acceleration, running along the distance, and entering the finish line, which resulted in a decrease in their sports results.

It is known that in order to achieve and maintain maximum speed in short-distance running, athletes must correctly hold their body relative to the running track. Of course, this depends on the level of development of their technical training. This allows the athlete to move forward as much as possible by lifting the thigh high and freely, and to push off under the crown for the shortest possible time and with maximum force. If an athlete throws his body forward in order to increase his speed even further at maximum speed, the body will have to spend additional energy to maintain balance. As a result, the above-mentioned general center of gravity, that is, the movement of the pelvis, loses its strength and leads to a decrease in forward speed, as a result, the athlete switches to running with the heel, not the sole of the foot. This in itself leads to a violation of the technique, as well as a decrease in sports results. Therefore, in the process of training short-distance runners, special attention should be paid to their technical preparation and its development. Therefore, this issue is one of the urgent tasks of both theoretical and practical importance in the system of training athletes.

Research purpose: To study the technical preparation of student-athletes running short distances based on video analysis and to develop proposals and recommendations for improving their running technique.

Research objectives:

- to study scientific and methodological literature on the topic and identify errors and shortcomings in running technique based on video analysis;
- to develop proposals and recommendations for improving the technical preparation of student-athletes running short distances based on special exercises;

In order to determine the technical readiness of short-distance running student-athletes, we studied the step length, number of steps, running cadence per minute, overall results in running 100 m. and the dynamics of running time for each 10 m. distance based on video analysis.

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The results obtained are presented in Table 1. According to it, the average 100 m. running time of the short-distance running student-athletes involved in the study was 11.75±0.11 seconds at the beginning of the study, while the average results for 10 m. distances were 1.18±0.01 seconds. The average step length was 1.88±0.01 cm. The running cadence was 239.17±1.63 times. The average number of steps was 53.19±0.34 times.

Student athletes ran the first ten meters from the start in an average of 2.22±0.08 seconds. They ran the second ten-meter zone in an average of 1.21±0.9 seconds. They ran the third ten-meter zone in 1.10±0.04 seconds. They ran the fourth ten-meter distance in an average of 1.02±0.02 seconds, while they ran the fifth 10 m. distance in 1.01±0.01 seconds. They ran the sixth segment in 1.00±0.01 seconds. We can see that they ran the seventh ten-meter segment of the distance in 1.02±0.03 seconds. In this case, it was observed in a pedagogical study that fatigue was observed at a distance of 70-80 meters. They ran the next eighth ten-meter segment in an average of 1.04±0.04 seconds. They ran the ninth segment in 1.08±0.03 seconds. They ran the last tenth segment in 1.06±0.04 seconds and ran to the finish line. It became clear from the obtained research results that technical errors were observed in the start and exit from the start and in running along the distance in the 100 m. race. In addition, it showed that the musculoskeletal system was not developed in their running technique. Therefore, taking into account the above, it indicates the need to develop a methodology to improve their running technique in the future based on the development of musculoskeletal systems. This will help to increase the sports results of student athletes in the future. Results

As can be seen from the results obtained at the beginning of the pedagogical experiment, there are enough shortcomings in the running of short-distance runners at a distance of 100 m. It was studied through video images taken during the pedagogical observation process.

The results of the pedagogical experiment show that the running technique of student athletes at a distance of 100 m seems to be very well-formed from the surface. However, if we analyze these running phases using video analysis, it was shown that there are enough shortcomings in their running technique. The results obtained are presented in Table 1.

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Table 1 Cases of occurrence of technical errors in the section of phases in short-distance running

Training tasks	Errors
Start and running from the start	
Teaching starting positions	Incorrect placement of feet and hands on the start line
Teaching the low start position	Shoulder projection forward on the start line
Teaching the technique of performing the "Attention" position in the low start position	Failure to raise the pelvis or excessive elevation when executing the "Attention" command
Teaching the technique of running from the start and starting after the march command	Executing the push-off at a very high speed when starting and lifting the first step high or landing the first foot on the start line when leaving the starting post
Teaching the technique of running with speed from the start	Experiencing wind resistance due to raising the head sharply when gaining starting speed and lifting the waist too early to gain starting speed
Running along the distance	
Teaching the technique of running from the start and running along the distance	Performing distance running movements in an incompletely balanced position
Teaching the technique of running at a distance	When running over a distance, the body leans forward and leans back
Teaching the technique of running at the right distance	Excessive energy expenditure due to insufficient forward and upward movement of the swinging leg
Teaching the technique of running at the right distance	Lack of coordination in arm and leg movements and intensity of movements,
Teaching the technique of running on the turn (when entering the turn, running on the straight track after the turn) in different situations	Changing the starting poles when turning, which causes the running to move from the designated lane to another lane
Entering the finish line	
Teaching the technique of entering the finish line	Injury resulting from a fall by an athlete due to prematurely bending a part of the body forward while crossing the finish line

Based on the results of the above pedagogical observations, we developed a "Multi-joint pumping" method for short-distance runners, taking into account their technical training, to develop the muscles of the arms, shoulders, waist, abdomen and legs. This developed "Multi-joint pumping" method was introduced into the training process of student-athletes running short distances. These multi-joint pumping exercises are as follows:

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1. Developing tendon reflexes through large-amplitude flexion and extension exercises of the hip, knee and calf joints
2. Jumping up with legs in pairs from a standing position and landing on the ground with hands on the ground, and performing repeated large-amplitude jumps up without lifting the heels. This exercise should be performed 10 times at high intensity. Rest interval - 1-2 minutes.
3. Jump up on one leg from a standing position and land on the ground with your hands on the ground, and perform repeated jumps up with a large amplitude, alternating legs. This exercise should be performed 10 times at high intensity. Rest interval - 1-2 minutes.
4. Jump up on both legs from a standing position and land on the ground with your hands on the ground. After this movement, throw the pair of legs back, dynamically bend the left leg and replace it with the right leg, repeat the exercise 4 times on each leg, and return to the starting position and repeat the jump up from a sitting position. This exercise should be performed 10 times at high intensity. Rest interval - 1-2 minutes.
5. D.h. - the athlete takes a running position, jumps up for 10 seconds, changes the position of the arms and legs in the air, and returns the legs and arms to their original position during the landing process.

This training method is used as an effective tool for developing the tendon reflex in runners during training. The use of this tool develops the hip, knee and ankle joints. In running, it is impossible to achieve high sports results without developing the above joints. In running, especially in short-distance running, the tendon reflex is important in the phases of starting, gaining speed from the start and running along the distance. This developed methodology for developing technical training serves to develop their technical training.

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Table 2 Application of the multi-joint pumping method for student-athletes running short distances

№	Exercise content	Standard	Organizational and methodological instructions
1	Formation of tendon reflexes through exercises for flexion and extension of the hip, knee and ankle joints with a large amplitude	Individually	During the exercise, the intensity and rate of the exercise are determined based on the athlete's level of preparation.
2	Jumping up with legs in pairs while standing still and landing on the ground with hands on the ground and performing repeated jumps up with a large amplitude without lifting the heel.	10 times 10 sec. 30 sec.	This exercise should be performed 10 times at high intensity. Rest interval -1 minute.
3	Jumping up on one leg while standing still and landing on the ground with hands on the ground and performing repeated jumps up with a large amplitude by switching legs.	10 times 10 sec. 30 sec.	This exercise should be performed 10 times at high intensity. Rest interval -1 minute.
4	Jumping up with legs in pairs while standing still and landing on the ground with hands on the ground. After this movement, throw the pair of legs back, dynamically bend the left leg and switch to the right leg, repeat the exercise 4 times for each leg and return to the starting position and repeat the jump up from a sitting position.	10 times 10 sec. 30 sec.	This exercise should be performed 10 times at high intensity. Rest interval -1 minute.
5	d.h. - the athlete assumes a running position, jumps up for 10 seconds, changes the position of the arms and legs in the air, and returns the legs and arms to their original position during the landing process.	10 times 10 sec. 30 sec.	This exercise should be performed 10 times at high intensity. Rest interval -1 minute.

The results of the pedagogical experiment showed that the “Multi-joint pumping” methodology developed for short-distance runners to develop their technical training serves not only to develop the muscles of the arms, shoulders, waist, pelvis-hip, and ankle-foot joints in the technical training of short-distance runners

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during the start, exit from the start, running along the distance, and entering the finish line, but also to improve the sports results of student-athletes.

We introduced the "Multi-joint pumping" method into the training of short-distance runners and repeatedly used it at the beginning and in the middle of the training. We focused on determining the effectiveness of this multi-joint pumping method at the end of the study and determined technical training based on the above tests. According to it, the step length at the end of the study was 1.98±0.03 cm. The number of steps decreased by 50.54±0.74 times. The running cadence was 239.20±1.63 per minute.

The average result of running a distance of 100 m in the subjects was 11.29±0.08 seconds. The average time spent on a distance of 10 m was 1.13±0.01 seconds. The time spent on the first 10 m from the start and the start was 2.03±0.05 seconds. The second 10 m was run in 1.11±0.05 seconds. The third 10 m was run in 1.06±0.04 seconds, the fourth 10 m in 1.02±0.02 seconds, and the fifth segment in 1.01±1.01 seconds. The sixth and seventh 10 m segments were run in 1.00±0.00 seconds. The eighth 10 m segment was run in 1.01±0.02 seconds. The ninth 10 m segment was run in an average of 1.03±0.03 seconds, and the last 10 m segment was run in 1.02±0.03 seconds. If we pay attention to the overall results of all athletes, it was observed that they achieved positive changes in all parameters. So, this indicates that the introduction of the "Multi-joint pumping" method into the training process of athletes involved in short-distance running and jumping will help them show high-level sports results in the future.

The average result of the test subjects in the 100 m race was 11.29±0.08 seconds. The average time spent on the 10 m race was 1.13±0.01 seconds. The time spent on the first 10 m from the start and exit was 2.03±0.05 seconds. The second 10 m race was 1.11±0.05 seconds. The third 10 m race was 1.06±0.04 seconds, the fourth 10 m race was 1.02±0.02 seconds, and the fifth race was 1.01±1.01 seconds. The sixth and seventh 10 m races were 1.00±0.00 seconds. They ran the eighth 10 m distance segment in 1.01±0.02 seconds. They ran the ninth 10 m distance segment in an average of 1.03±0.03 seconds, and they ran the last 10 m distance in 1.02±0.03 seconds. If we pay attention to the overall results of all athletes, it was observed that they achieved positive changes in all parameters. So, this indicates that the introduction of the "Multi-joint pumping" method into

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the training process of athletes involved in short-distance running and jumping will help them show high-level sports results in the future.

If we compare the results of this study with the data provided by L.P. Sergienko and O. M. Mirzayev, we can see that the average stride length of highly qualified short-distance runners participating in the world championships was 231.4 cm., the average stride length from the initial start was 137 cm., the average stride length was 263 cm., and the final distances were 256 cm.

Table 3

Functional and technical training of student-athletes (n=12) who were sprinters at the end of the study, including stride length, running cadence, number of steps, and distance covered

Step length	Number of steps at a distance of 100 m	Running cadence/min.	100 m. results	Time spent on a distance of 10 m	10(1)	10(2)	10(3)	10(4)	10(5)	10(6)	10(7)	10(8)	10(9)	10(10)
1,95	51,2	235,81	11,45	1,14	2,1	1,2	1,1	1	1	1	1	1	1,05	1
1,97	50,7	238,52	11,32	1,13	2,1	1,1	1,1	1	1	1	1	1	1	1,02
2,01	49,8	239,15	11,29	1,13	2	1,1	1	1	1	1	1	1,01	1,1	1,08
2,01	49,7	240,21	11,24	1,12	2	1,2	1,02	1	1	1	1	1	1	1,02
1,95	51,2	238,1	11,34	1,13	2,1	1,1	1,08	1,05	1,01	1	1	1	1	1
2,02	49,6	241,07	11,2	1,12	1,99	1,05	1,05	1,02	1	1	1	1	1,05	1,04
2	50,1	241,5	11,18	1,12	2	1,1	1,08	1	1	1	1	1	1	1
1,93	51,9	237,68	11,36	1,14	2	1,1	1,1	1,05	1,02	1	1	1	1,05	1,04
1,95	51,2	240,21	11,24	1,12	2	1,1	1,02	1,01	1	1	1	1,02	1,04	1,05
1,97	50,7	239,15	11,29	1,13	2,1	1,06	1,05	1,04	1	1	1	1,04	1	1
1,98	50,6	238,31	11,33	1,13	2	1,1	1,05	1,03	1,03	1	1	1,05	1,04	1,03
2,01	49,8	240,64	11,22	1,12	2	1,1	1,02	1	1	1	1,01	1,02	1,06	1,01
1,98	**50,54**	**239,20**	**11,29**	**1,13**	**2,03**	**1,11**	**1,06**	**1,02**	**1,01**	**1,00**	**1,00**	**1,01**	**1,03**	**1,02**
0,03	**0,74**	**1,63**	**0,08**	**0,01**	**0,05**	**0,05**	**0,04**	**0,02**	**0,01**	**0,00**	**0,00**	**0,02**	**0,03**	**0,03**

The number of steps they took was 44.9 times on average. We can see that the average result of 8 of the finalists in the 100 m. race was 10.12±0.1 seconds.

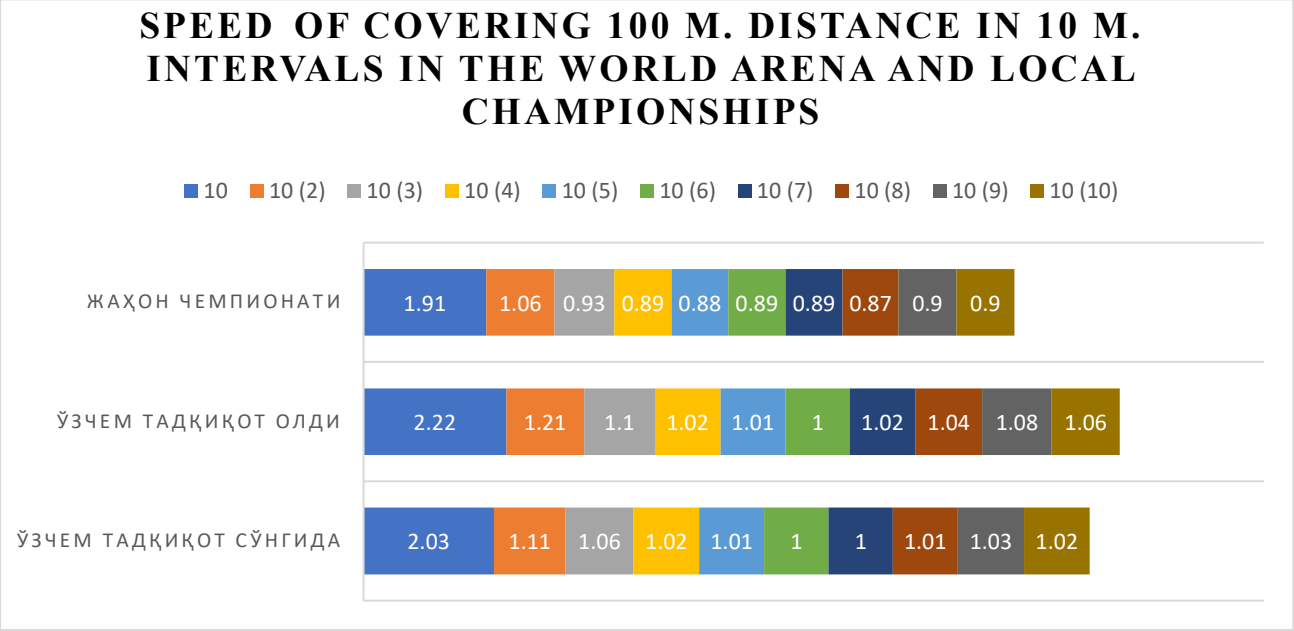

Diagram 1

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A comparative analysis of the results recorded above by student-athletes and participants in world championships showed us that in order to improve the technical readiness of student-athletes during training, it is necessary to use the multi-joint pumping method aimed at developing various muscle groups in training. Only then will our student-athletes have the opportunity to show high sports results in international competitions.

Conclusions

The results of the study conducted to determine the technical readiness of student-athletes who run short distances allowed us to draw the following conclusions:

The analysis of the phases of the start, run from the start, run along the distance and approach to the finish line in the 100m race showed that the level of technical readiness in them was not sufficiently formed during the research process.

Based on the results of the conducted research, it is necessary to develop a complex of large-amplitude exercises for the development of technical training for sprinters and implement them in the training process, since a complex of large-amplitude exercises is considered an effective means of developing the abdominal, back, arm, and leg muscles of student-athletes.

Comparing the results of the research conducted to determine the technical training of sprinters with the data provided by leading scientists shows that we are significantly lagging behind the data provided by them. Therefore, it is advisable to make changes to their training systems to develop their technical training. Only then will we have the opportunity to solve the tasks set before us, namely to fight for medals at the world championships.

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