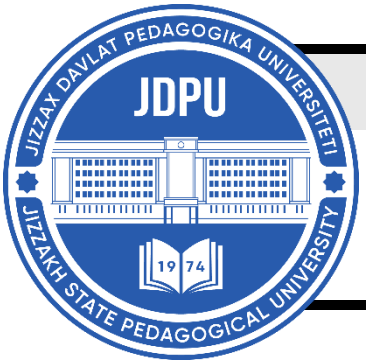
DOI: https://doi.org/10.37547/mesmj-V6-I6-25 Pages: 184-191

MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL



MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL

http://mentaljournal-jspu.uz/index.php/mesmj/index

IMPROVEMENT OF SPORTS RESULTS BY IMPROVING TECHNIQUES IN RUNNING ATHLETICS

M.S. Olimov
Uzbekistan State University of Physical Education and Sports
Professor, Doctor of Pedagogical Sciences (DSc)

I.R. Soliev
Associate Professor, (PhD)
Uzbekistan State University of Physical Education and Sports

K. Marufkhodzhaev
Uzbekistan State University of Physical Education and Sports
Tashkent, Uzbekistan

ABOUT ARTICLE

Key words: short-distance running, running technique, step frequency, number and length, running cadence, athletes, sports results and mistakes.

Received: 20.09.25
Accepted: 21.09.25
Published: 22.09.25

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.

Discussion of the results. In short-distance running, the technique of running is a technical factor that significantly affects the result of the athlete, such as the frequency of steps, the length of steps, the running cadence, and hand movements, and the technique of running is the main factor in the athlete's effective running and economical energy expenditure. This is because running technique forms the integrity of body movement. In this case, the movements of the arms and legs, performing coordinated movements, allow for ensuring the effectiveness of the athlete's running technique.

In short-distance running, an athlete's performance is directly related to their running technique, and sometimes athletes with different techniques can be found among runners. Therefore, teaching them the correct execution of running technique is the primary objective of the training sessions.

In our research conducted during the pedagogical experiment, it was revealed that there are also athletes who grossly violate running technique by student-athletes. Especially in short-distance running, as a result of errors and shortcomings made by student athletes in the phases of starting, starting acceleration, running the distance, and entering the finish line, there were cases of a decrease in their sports results.

It is known that in short-distance running, to achieve maximum speed and maintain it, athletes must hold their body correctly relative to the running track. Of course, this depends on the level of development of technical training. This, in turn, ensures the athlete's maximum forward movement, allowing them to lift their thighs high and freely, pushing them downwards for the shortest possible time and with maximum force. If an athlete throws their body forward to increase speed at maximum speed, the body will have to expend additional energy to maintain balance. As a result, the above-mentioned general center of gravity, i.e., the push-off motion under the pelvis, loses its force and leads to a decrease in the speed of forward movement, as a result of which the athlete switches to running with the heel rather than the sole of the foot. This, in turn, leads to technical breakdowns and a decrease in sports results. Therefore, in the process of training short-distance runners, it is necessary to pay special attention to and develop their technical training. Therefore, in the system of training athletes, this issue is one of the urgent tasks of both theoretical and practical significance.

The aim of the research is to study the technical training of student-athletes in short-distance running based on video analysis and to develop proposals and recommendations for improving running technique.

Research objectives:

- study of scientific and methodological literature on the topic and identification of errors and shortcomings in running technique based on video analysis;

- development of proposals and recommendations for improving the technical training of student-athletes running short distances based on special exercises;

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

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

When running the first ten meters of the 100 meters start, the student athletes ran in an average of 2.22±0.08 seconds. The second ten-meter zone was run in an average of 1.21±0.9 seconds. The third ten-meter zone was completed in 1.10±0.04 seconds. The fourth ten-meter distance was run in an average of 1.02±0.02 seconds, while the fifth 10 m distance was run in 1.01±0.01 seconds. The sixth segment was completed in 1.00±0.01 seconds. We can see that they covered the seventh ten-meter segment of the distance in 1.02±0.03 seconds. In this case, in the pedagogical study, a state of fatigue was observed from a distance of 70-80 meters. The next eighth ten-meter segment was run in an average of 1.04±0.04 seconds. The ninth segment was completed in 1.08±0.03 seconds. The final tenth segment was completed in 1.06±0.04 seconds, and they entered the finish line. From the obtained research indicators, it became known that technical errors were observed in the 100 m run, starting from the start, and running the distance. Moreover, it was shown that their musculoskeletal system in running technique was underdeveloped. Therefore, taking into account the above, it is necessary to develop a methodology for improving their running technique based on the development of musculoskeletal systems in the future. This will serve to increase the sports results of student-athletes in the future.

Obtained Results. As can be seen from the results obtained at the beginning of the pedagogical experiment, the short-distance runners had sufficient shortcomings in the 100m run, which was studied using video images obtained during the pedagogical observation process.

The results of the conducted pedagogical experiment indicate that in the running technique of student-athletes running short distances, the phases of the start and the exit from the start appear very well formed from the outside. However, if we analyze these running phases using video analysis, it turns out that there are enough shortcomings in their running technique. The obtained results are presented in Table 1.

Table 1

Cases of occurrence of technical errors in the phase cross-section in short-distance running

Teaching Tasks	Errors
The start and running from the start	

Teaching starting positions	Incorrect placement of feet and hands at the starting line
Teaching the crouch start position	Projection of the shoulders forward at the starting line
Teaching the technique of executing the 'Attention' position in crouch start	Incorrect execution of the 'Attention' command (pelvis not raised or raised too high)
Teaching the technique of running after the start	Overly fast push-off when starting, resulting in the first step being lifted too high, or the first foot landing on the start line after leaving the starting blocks
Teaching running after the 'March' command	Sharp raising of the head and premature lifting of the lower back, which leads to wind resistance while accelerating
Running along the distance	
Teaching running along the distance	Incomplete push-off while running along the distance
Teaching distance running technique	Excessive forward or backward leaning of the torso while running along the distance
Teaching correct distance running technique	Swing leg not raised sufficiently forward or upward, resulting in excessive energy consumption
Teaching proper running technique along the distance	Lack of coordination between arm and leg movements, movements too frequent or dense
Teaching turning technique (entering a turn, exiting into the straight lane)	Incorrect placement of starting blocks on the curve, leading to the runner stepping into another lane
Finishing	
Teaching finishing technique	Leaning the body forward too early when approaching the finish line, which may cause the athlete to fall and get injured

Based on the results of the above pedagogical observations, taking into account the technical preparedness of short-distance runners, we developed a method called the “Multi-joint Pumping” exercise, aimed at strengthening the muscles of the arms, shoulders, back, abdomen, and leg joints. This developed “Multi-joint Pumping” method was introduced into the training process of student-athletes specializing in short-distance running. The multi-joint pumping exercises are as follows:

1. Developing tendon reflexes through large-amplitude flexion and extension of the hip, knee, and ankle joints.

2. From a standing position, performing double-leg jumps upward and landing with hands supported on the ground, followed by repeated large-amplitude jumps upward without lifting the heels. This exercise should be performed 10 times at high intensity. Rest interval: 1–2 minutes.

3. From a standing position, performing single-leg jumps upward, landing with hands supported on the ground, alternating legs, and continuing repeated large-amplitude

jumps upward. This exercise should be performed 10 times at high intensity. Rest interval: 1–2 minutes.

4. From a standing position, performing double-leg jumps upward, landing with hands supported on the ground. After this movement, extend both legs backward, dynamically bend the left leg while switching to the right, repeating the exercise 4 times on each leg. Return to the initial squat position and repeat the jump upward. This exercise should be performed 10 times at high intensity, with a rest interval of 1–2 minutes.

5. Initial position – the athlete takes the running stance, then for 10 seconds jumps upward, alternating the positions of the arms and legs in the air, and upon landing returns them to the starting position.

This training method is applied as an effective tool for developing tendon reflexes during the training process of runners. Its use develops the hip, knee, and ankle joints. In running disciplines, especially in short-distance races, achieving high athletic results is impossible without developing these joints. In particular, tendon reflex plays a crucial role in sprint events during the phases of the start, acceleration from the start, and running along the distance. The developed methodology for enhancing technical preparedness contributes to improving athletes' technical readiness.

The results of the pedagogical experiment indicated that the "Multi-joint Pumping" method, developed for improving technical preparedness in short-distance runners, not only strengthened the muscles of the arms, shoulders, back, hips, calves, and feet during the phases of starting, acceleration, distance running, and finishing, but also contributed to the improvement of the athletes' performance outcomes.

We introduced the "Multi-joint Pumping" method into the training sessions of student sprinters, applying it repeatedly at the beginning and middle of training. At the end of the research, we again evaluated its effectiveness and confirmed the technical preparedness based on the above-mentioned tests. Accordingly, stride length at the end of the study averaged 1.98±0.03 cm, the number of strides decreased by 50.54±0.74, and the running cadence reached 239.20±1.63 steps per minute.

At the end of the study, the indicators of stride length, running cadence, number of strides, and distance running performance were assessed in short-distance student-athletes (n=12) in terms of their functional and technical preparedness.

Stride length	Number of strides over 100 m distance	Running cadence per minute	100 m results	Time spent to cover 10 m distance
1,95	51,2	235,81	11,45	1,14

1,97	50,7	238,52	11,32	1,13
2,01	49,8	239,15	11,29	1,13
2,01	49,7	240,21	11,24	1,12
1,95	51,2	238,1	11,34	1,13
2,02	49,6	241,07	11,2	1,12
2	50,1	241,5	11,18	1,12
1,93	51,9	237,68	11,36	1,14
1,95	51,2	240,21	11,24	1,12
1,97	50,7	239,15	11,29	1,13
1,98	50,6	238,31	11,33	1,13
2,01	49,8	240,64	11,22	1,12
1,98	**50,54**	**239,20**	**11,29**	**1,13**
0,03	**0,74**	**1,63**	**0,08**	**0,01**

The average result of running 100 meters among the tested short-distance student-athletes was 11.29±0.08 seconds. The average time to cover 10 meters was 1.13±0.01 seconds. The time spent on the initial 10 meters from the start and acceleration phase was 2.03±0.05 seconds. The second 10-meter segment was covered in 1.11±0.05 seconds. The third 10 meters were completed in 1.06±0.04 seconds, the fourth in 1.02±0.02 seconds, and the fifth segment in 1.01±0.01 seconds. The subsequent sixth and seventh 10-meter segments were each run in 1.00±0.00 seconds. The eighth 10-meter segment was covered in 1.01±0.02 seconds. The ninth segment was completed in an average of 1.03±0.03 seconds, while the final 10 meters were run in 1.02±0.03 seconds.

Considering the overall results of all athletes, it was observed that they achieved positive improvements across all measured parameters. This indicates that the introduction of the “Multi-joint Pumping” method into the training process of sprinters and jumpers contributes to the achievement of higher-level athletic performance in the future.

A comparative analysis of the results obtained from this study with the data provided by L.P. Sergienko and O.M. Mirzaev shows that highly qualified sprinters who participated in world championships demonstrated an average stride length of 231.4 cm. The stride length at the initial start phase was about 137 cm, while the average stride length during distance running was 263 cm, and in the final segments it was about 256 cm. Their average number of strides was 44.9. Moreover, the average result of the 8 finalists in the 100-meter race was 10.12±0.1 seconds.

Conclusions. The results of the study conducted to assess the technical preparedness of student sprinters in short-distance running led to the following conclusions:

- The analysis of the 100-meter sprint, including the phases of the start, acceleration, running along the distance, and finishing, showed that the level of technical preparedness among student sprinters had not been sufficiently developed at the time of the research.
- Based on the study results, it is necessary to develop and implement a set of exercises with large amplitudes into the training process of sprinters. This is because such exercises are considered one of the effective methods for developing the muscles of the abdomen, back, arms, and legs in student-athletes.
- A comparative analysis of the study results with data provided by leading scholars revealed that the technical preparedness of the examined student sprinters significantly lags behind international standards. Therefore, it is advisable to introduce changes into their training systems to enhance technical readiness.

By doing so, it will be possible to achieve the set goals, namely, to enable athletes to compete for medals at world championships.

References:

1. Olimov Mukhsinbek Sotivoldiyevich, DYNAMIK DER AUSBILDUNG DES SPEZIALKÖRPERLICHEN TRAININGS IM LANGSTRECKENLÄUFER. Berlin Studies Transnational Journal of Science and Humanities. Vol.1 Issue 1.5 Pedagogical sciences. 68-76 p. http://berlinstudies.de/index.php/berlinstudies/article/view/60
2. М.С. Олимов. Ўрта масофага югурувчи спортчиларда жисмоний тайёргарлик даражасини шаклланиш динамикаси. Fan-sportga. Ilmiy nazariy jurnal. 2021 й. 2-сон. 16-18б. e-mail: fan_sportga@uzdjtsu.uz
3. Muxsinbek Olimov. Yengil atletikachilarning ko’p yillik tayyorgarlik bosqichlarida mashg‘ulot yuklamalarini taqsimlash va boshqarish texnologiyasi. Pedagogik mahorat. Ilmiy-nazariy va metodik jurnal 3-son (2021-yil, iyun).
4. Olimov, Muxsinbek Sotiboldiyevich (2021) "A method of special physical training of short-distance runners in athletics”, Eurasian Journal of Sport Science: Vol. 1: Iss. 2, Article 17. Available at: https://uzjournals.edu.uz/eajss/vol1/iss2/17/
5. Муҳсин Олимов. Ўрта масофага югурувчиларнинг мусобақа олди тайёргарлик машғулотларини режалаштириш. Pedagogik mahorat. Ilmiy-nazariy va metodik jurnal. 1-son (2021-yil, fevral).
6. Iqrorjon Roziqovich Soliev, Larisa Vladimirovna Smurygina. TECHNOLOGIES FOR PREPARING RUNNERS AVERAGE DISTANCES TO COMPETITION. Emergent: JOURNAL OF

EDUCATIONAL DISCOVERIES AND LIFELONG LEARNING (EJEDL). 2776-0995 Volume 2, Issue 10, Oct, 2021. 21-27. https://ejedl.academiascience.org/index.php/ejedl/article/view/144

7. Soliev I.R., Khaydarov B., Mirzatillaev I., Khojamkeldiev G., Ziyaev F., Functional training level of runners student-athletes sprinters. // International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 05, 2020, http://www.psychosocial.com/article/PR201878/17061/

8. Soliev I.R., Davidova K.R., Azamova G. E. Analysis of the training and management process management system in athletics. Academic Research in Educational Sciences. Volume2/Special issue 1/2021

9. Rakhimova.D Z / Improving the physical training of triathlons in the training group //Academic research in educational sciences. Volume 1/ Issue 3/2020

10. Soliev I.R., Kholbekova D.N., Davlatyorova L. B., Azamova G. E. / Improvement of technical training in short running athletics. // Academic Research in Educational Sciences. Volume2/Special issue 1/2021