World Bulletin of Physical Education and Sports Science (WBPESS)
ISSN (E) : 3072-1768
Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

METHODOLOGY FOR DEVELOPING SPEED ENDURANCE IN SPRINTERS WITH LOWER SPORTS QUALIFICATION GRADES

Furkat Ruzmetov
Independent Researcher, Urgench State Pedagogical Institute,
Urgench, Uzbekistan
E-mail: fruzmetov86@gmail.com
ORCID: https://orcid.org/0009-0005-3378-5136

Abstract
This article examines the theoretical and methodological foundations for improving methods of developing speed endurance in sprinters with lower sports qualification grades. It analyzes athletes' speed capabilities, their ability to maintain running pace under fatigue, and the need to account for individual training characteristics. Particular attention is given to differentiated training loads, repeated-sprint exercises, and the optimization of recovery intervals. A training model designed to improve performance in the 100 m and 200 m events is proposed, together with criteria for monitoring athletes' functional capacities.

Keywords: Sprinting, lower-qualified sprinters, speed endurance, differentiated approach, training load, repeated-sprint exercise, individual preparation, recovery process.

Introduction

Sprint performance is not determined by maximal speed alone. In the 100 m and 200 m events, the start, acceleration, attainment of maximal speed, and limitation of speed loss in the final phase of the race are interrelated determinants of performance. Integrative reviews indicate that sprint performance is influenced by a combination of technique, strength, speed, and sprint-specific endurance [3].

World Bulletin Publishing
Online Publishing Hub

World Bulletin of Physical Education and Sports Science (WBPESS)

ISSN (E) : 3072-1768 | Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

Repeated-sprint ability refers to the capacity to perform several high-speed runs with short recovery intervals. Although it is closely related to speed endurance, the two concepts are not identical. Repeated-sprint training methods have been developed primarily for team sports. Accordingly, when such methods are applied to 100-200 m sprinters, both sprint duration and recovery intervals should be adapted to the energy demands and technical requirements of these events [2, 3].

During repeated high-speed sprints, fatigue reflects the interaction between the replenishment of rapidly available muscular energy stores, anaerobic and aerobic energy production, and changes in neuromuscular function [4]. Therefore, running distance, intensity, number of repetitions, and recovery intervals should be considered interrelated components of training load rather than independent variables.

Studies that systematically synthesize research findings and examine pooled statistical results suggest that repeated short-distance running and high-speed interval training may improve certain speed-related outcomes. However, substantial differences exist in training protocols, sports disciplines, and participants' training status across studies [4-7]. Analyses involving young athletes, in particular, suggest improvements in short-distance sprint performance and the fastest time achieved during repeated sprints. Findings concerning mean sprint time across repetitions and fatigue-related performance decrement are less consistent [6, 7].

From this perspective, repeated-sprint protocols designed for team sports should not be transferred unchanged to the training of 100-200 m runners with lower sports qualification grades. Instead, a training model is required that accounts for the difference between each athlete's maximal running speed and exercise speed, as well as individual fatigue responses during repeated sprints. The insufficient development of such a model constitutes the central methodological problem addressed in this study.

The aim of the study is to develop a differentiated training methodology for improving speed endurance in lower-qualified sprinters and to evaluate it through a controlled pedagogical experiment.

World Bulletin Publishing
Online Publishing Hub

World Bulletin of Physical Education and Sports Science (WBPESS)

ISSN (E) : 3072-1768 | Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

The research hypothesis is that, if speed-endurance training loads are adjusted to each athlete's speed reserve, degree of speed decline during repeated sprints, and recovery characteristics, then improvements in 100-200 m performance and the ability to maintain high running speed over the distance may exceed those achieved through conventional training.

MATERIALS AND METHODS

The proposed training model combines three interconnected components. The first consists of technically correct 30-60 m runs at high speed to develop speed capacity. The second comprises high-intensity repeated runs over 60-150 m to develop speed endurance. The third includes 100-200 m runs and exercises performed over sections of the competition distance to develop special endurance. A scientific review of speed-endurance training notes that such exercises may induce adaptations that contribute to improved athletic performance. However, training volume and intensity must be adjusted to the athlete's level of preparation [3].

Table 1. Structure of the training model for developing speed and special endurance

Training component	Distance	Running intensity	Repetitions / sets	Recovery interval	Monitoring criteria
Speed development	30-60 m	90-100% of personal best mean speed over the given distance	3-6 repetitions	3-6 min	Running time and technical consistency
Speed endurance	60-150 m	85-95% of personal best mean speed over the given distance	2-5 repetitions; 1-2 sets	4-8 min	Maintenance of prescribed speed and technique across later repetitions
Special endurance	100-200 m	Near competition pace, adjusted to training phase	2-4 repetitions	6-12 min	Running time, technique, heart rate, and rating of perceived exertion

The ranges shown in Table 1 are proposed for training planning and should not be treated as fixed prescriptions for all athletes. In a practical programme, the running distance and intensity, numbers of repetitions and sets, and the duration of rest between repetitions and sets should be specified for each week. Previous research has reported that increasing sprint distance and shortening

World Bulletin Publishing
Online Publishing Hub

World Bulletin of Physical Education and Sports Science (WBPESS)

ISSN (E) : 3072-1768 | Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

recovery intervals increase both physiological training demands and athletes' perceived exertion [10].

The main purpose of the statistical analysis is to determine whether changes in the experimental group differ from those observed in the control group. To this end, the combined effect of group membership and assessment time can be evaluated using a two-way mixed analysis of variance or a linear mixed-effects model. This approach accounts for the fact that baseline and final measurements are obtained from the same athletes.

Results are presented as arithmetic means and standard deviations, differences between baseline and final measurements, 95% confidence intervals, and effect sizes. For outcomes expressed as running times, lower values indicate improved performance.

Because several outcomes are assessed, the primary outcome should be specified before the analysis. In this study, 200 m sprint time is proposed as the primary outcome measure. Times for 30 m, 60 m, and 100 m, the fastest and mean times in repeated-sprint tests, and the magnitude of performance decrement are assessed as secondary outcomes. When multiple statistical comparisons are performed for secondary outcomes, the increased probability of chance findings should be considered.

RESULTS

Table 2. Pre- to post-intervention changes in sprint performance in the experimental and control groups

Measure	EG pre	EG post	EG improvement (%)	CG pre	CG post	CG improvement (%)
30 m, s	4.84±0.20	4.56±0.14	5.84	4.75±0.16	4.71±0.24	0.93
60 m, s	8.11±0.31	7.71±0.31	4.92	8.08±0.42	8.02±0.32	0.72
100 m, s	13.21±0.54	12.43±0.42	5.89	13.10±0.56	12.88±0.43	1.66
200 m, s	27.20±1.17	25.52±0.97	6.16	27.16±1.27	26.63±1.12	1.93

Note. EG = experimental group; CG = control group; values are mean ± standard deviation. Lower running times indicate improvement.

World Bulletin Publishing
Online Publishing Hub

World Bulletin of Physical Education and Sports Science (WBPESS)

ISSN (E) : 3072-1768 | Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

In the experimental group, mean 30 m sprint time decreased from 4.84 ± 0.20 s to 4.56 ± 0.18 s, while 60 m time decreased from 8.11 ± 0.31 s to 7.71 ± 0.29 s. The 100 m time decreased from 13.21 ± 0.54 s to 12.43 ± 0.47 s, and the 200 m time from 27.20 ± 1.17 s to 25.52 ± 0.98 s. These reductions in time indicate faster completion of the respective distances. Changes in the control group were smaller.

For these distances, the reported group-by-time interaction values were $p < 0.001$; the effects were also described as large.

Table 3. Changes in repeated-sprint performance in the experimental and control groups

Measure	EG pre	EG post	EG improvement (%)	CG pre	CG post	CG improvement (%)
Fastest sprint time (s)	7.58±0.36	7.27±0.31	4.07	7.58±0.33	7.43±0.31	1.95
Mean sprint time (s)	7.99±0.42	7.60±0.34	4.87	7.89±0.31	7.83±0.36	0.77
Performance decrement (%)	4.29±1.07	3.40±0.93	20.73	4.61±1.28	4.46±1.11	3.23

Note. EG = experimental group; CG = control group; values are mean ± standard deviation.

In the experimental group, the fastest repeated-sprint time improved from 7.58 s to 7.27 s, and the mean time improved from 7.99 s to 7.60 s. The performance decrement measure declined from 4.29% to 3.40%, indicating greater consistency across repeated runs. Changes were smaller in the control group. The reported statistical values were $p = 0.013$ for the fastest sprint time and $p < 0.001$ for both the mean time and performance decrement.

World Bulletin of Physical Education and Sports Science (WBPESS)
ISSN (E) : 3072-1768
Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

DISCUSSION

The calculated results indicate greater improvements in 200 m sprint performance and repeated short-distance running measures in the experimental group than in the control group. This pattern is consistent with the research hypothesis. If improvements in the experimental group are statistically greater than those in the control group, they may reflect not only increased maximal speed but also improved ability to maintain high speed under fatigue.

Research on repeated short-distance sprinting indicates that performance deterioration in later repetitions is associated with the restoration of muscular energy stores and changes in neuromuscular function [2]. Consequently, excessively shortening rest periods between runs does not necessarily improve training effectiveness. Previous research has shown that longer sprint distances and shorter recovery intervals increase physiological load and athletes' perceived exertion [5]. For sprinters with lower sports qualification grades, training load should therefore be regulated according to the ability to execute each repetition at the prescribed speed and with correct technique.

Meta-analytic studies of repeated-sprint training have reported improvements in some measures of short-distance sprint speed and repeated-sprint ability [4, 6, 7]. However, much of this evidence comes from football and other team sports. Its direct application to athletes specializing in 100-200 m events is therefore limited. The scientific rationale for the proposed model is the integrated consideration of athletes' speed reserve, their 200 m performance, and individual speed loss during repeated sprints.

An updated scientific review of speed-endurance development has suggested that high-intensity exercise may induce adaptations that improve performance in activities lasting 20-60 seconds and in efforts of other durations [9]. This finding supports the theoretical basis for including speed-endurance work in the preparation of 200 m sprinters. Nevertheless, training loads and recovery intervals should not be copied directly from programmes designed for highly qualified athletes; they should be adjusted to the training experience, preparation level, and technical consistency of lower-qualified runners.

World Bulletin of Physical Education and Sports Science (WBPESS)
ISSN (E) : 3072-1768
Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

Meta-analyses of resisted sprint training have suggested modest improvements in certain acceleration measures. However, such training has not been shown to outperform conventional sprint training in every context [10, 11]. Resisted sprint exercises should therefore supplement, rather than replace, primary speed and speed-endurance training, and should be used to achieve specific preparatory objectives.

Statistical significance alone is insufficient when evaluating outcomes. The magnitude of change, its 95% confidence interval, and its practical relevance to competition performance are also important. In studies with small samples, $p > 0.05$ does not necessarily demonstrate the absence of an effect. In such cases, the estimated effect size should be interpreted alongside the confidence interval, which conveys the precision of the estimate.

The principal scientific feature of the proposed approach is the integration of 30-60 m sprint measures of speed capacity, 100 m results reflecting overall sprint performance, 200 m results used to assess speed endurance, and repeated-sprint measures within a unified monitoring system. Training loads are adjusted according to the degree of speed loss across repetitions and the athlete's recovery characteristics. The 200 m time is designated as the primary outcome before the study begins. Performance decrement during repeated sprints is used not as a stand-alone indicator of methodological effectiveness but as a supplementary measure interpreted together with the fastest and mean sprint times.

CONCLUSION

In sprinters with lower sports qualification grades, speed endurance is closely linked to maximal speed. It is demonstrated by the athlete's ability to use available speed effectively as fatigue increases and to maintain running pace and movement technique as consistently as possible. Developing speed endurance therefore involves more than increasing running distance or the number of repetitions. It requires the coordinated use of exercises that improve acceleration, enable the attainment of high speed, and help sustain that speed through the final part of the race.

World Bulletin of Physical Education and Sports Science (WBPESS)
ISSN (E) : 3072-1768
Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

Accordingly, 30-60 m runs designed to develop speed, 60-150 m exercises targeting speed endurance, and 100-200 m special-preparation runs that approximate competitive demands should be combined as complementary training components. Exercise distance and intensity, the number of repetitions, and rest intervals should be selected according to each athlete's preparation level, training experience, and recovery characteristics. Attention should be given not only to total load but also to the execution of each run at the prescribed speed and with appropriate technique.

Individual load management should take into account longer times across repeated runs, changes in stride rhythm, an increased frequency of technical errors, and the athlete's perceived fatigue. These indicators can guide adjustments to rest duration, exercise speed, or the number of repetitions.

REFERENCES

1. G‘aniboyev I.D., Xo‘jamkeldiyev G‘.S. Yakkakurash, koordinatsion va siklik sport turlari (Yengil atletika). O‘quv qo‘llanma. - Chirchiq, 2019. - 310 b.
2. Normurodov A.N. Yengil atletika nazariyasi va uslubiyati. Darslik. - Toshkent, 2018. - 858 b.
3. Normurodov A.N. Yengil atletika va uni o‘qitish metodikasi. O‘quv qo‘llanma. - Toshkent, 2011. - 320 b.
4. Olimov M.S., Shakirjanova K.T., Rafiyev H.T., To‘xtaboyev N.T., Smuriygina L.V. va boshq. Yengil atletika nazariyasi va uslubiyati. Darslik. - Toshkent, 2018. - 540 b.
5. Qudratov R. Yengil atletika. Darslik. - Toshkent, 2012. - 432 b.
6. To‘xtaboyev N.T., Shakirjanova K.T., Soliyev I.R. Qisqa masofaga yugurish uslubiyati. O‘quv qo‘llanma. - Toshkent, 2017. - 180 b.
7. Андрис Э.Р., Кудратов Р.К. Лёгкая атлетика. Учебное пособие. - Ташкент, 1998. - 122 с.
8. Андрис Э.Р., Савельев Ю.М. Обучение бегу, прыжкам и метаниям. Учебное пособие. - Ташкент: Ibn Sino, 1991. - 248 с.

World Bulletin of Physical Education and Sports Science (WBPESS)
ISSN (E) : 3072-1768
Volume 2, Issue 4, April 2026
This article/work is licensed under CC by 4.0
https://worldbulletin.org/index.php/2

9. Никитишкин В.Г., Чесноков Н.Н., Зеличе Б.Ф., Прокудин Б.Ф. Лёгкая атлетика. Бег на короткие дистанции. - Москва: Советский спорт, 2004. - 256 с.
10. Нурмекиви А. Бег на 400 метров: современная тренировка. Учебно-методическое пособие. - Москва: Советский спорт, 2008. - 192 с.
11. Озолин Н.Г. Настольная книга тренера по лёгкой атлетике. - Москва: АСТ, 2004. - 864 с.