

# Speed Tests and Control Exercises in Sports Practice

**Sandra Škutāne**

Department of Track and Field  
Athletics and Swimming  
Riga Stradins University Latvian  
Academy of Sport Education  
Riga, Latvia  
[sandra.skutane@rsu.lv](mailto:sandra.skutane@rsu.lv)

**Krišjānis Kuplis**

Department of Track and Field  
Athletics and Swimming  
Riga Stradins University, Latvian  
Academy of Sport Education  
Riga, Latvia  
[krisjanis.kuplis@rsu.lv](mailto:krisjanis.kuplis@rsu.lv)

**Ilze Avotiņa**

Department of Track and Field  
Athletics and Swimming  
Riga Stradins University, Latvian  
Academy of Sport Education  
Riga, Latvia  
[ilze.avotina@rsu.lv](mailto:ilze.avotina@rsu.lv)

**Abstract** – The theory of testing human physical fitness is one of the most fully developed in the field of sports theory. Of particular importance for the use of test results is the development of various standards. Standards are developed for a certain group of athletes and are valid only for it [1]. The most popular test or control exercise is the 30m run from the high start, a total of four speed ability assessment tests are offered – a 20m run from a high start, a 30m run from a high start, a 60m run from a high start and a 100m run from a high start. Not all sports mention normative results for women and men. Standards in professionally oriented sports, such as boxing, judo, football, hockey, karate, rugby and Nordic combined, are for men only. Such sports as boxing, judo and karate have the same control standards. In turn, in athletics, they are divided according to disciplines. The difference in results during testing is 0.5 seconds, as different systems for recording results are used – with a handheld stopwatch and an electronic result-recording machine. The highest requirements for High Performance Sport groups in the 20m race are set for men in gymnastics – 3.0seconds, and for women in weightlifting – 3.2seconds. The average score in sports where the speed test for the High-Performance Sport group is a 20-meter run from the spot is  $3.5 \pm 0.19$ seconds for men and  $3.6 \pm 0.19$ seconds for women.

Coaches of sports schools choose to fix the results with a hand stopwatch. Aim of the study: Evaluation of speed tests and control exercises in sports practice in Latvia.

**Keywords** – control exercises in sport practice, High-Performance Sport groups (HPS), speed tests.

## I. INTRODUCTION

The theory of testing human physical fitness is one of the most thoroughly developed areas in sports theory. The development of various standards (norms) is of particular importance for utilizing testing results. Standards are developed for a specific group of athletes and are only applicable to that group [1].

Through testing, it is possible to determine absolute and relative indicators of physical attributes. Absolute indicators characterize the level of development of physical qualities; in this study, we focus on the development level of speed among the High-Performance Sport (HPS) groups.

The Ministry of Education and Science of Latvia (MoES) oversees 36 professional sports disciplines. In 26 of these sports, athletes must perform one of the speed tests: a 20m sprint from a standing start, a 30m sprint from a standing start, a 60m sprint from a standing start, and a 100m sprint from a standing start.

The evaluation of results from control exercises must be conducted annually, and, at least once every 10 years, these results should be reviewed in accordance with the current situation in athlete development.

In the 2020/2021 year, the MES published informative materials for Latvian professional sports education institutions, which are also relevant today for the assessment of control exercise performance Control Standards for Groups of Professional Sports Education Institutions in the Context of the COVID-19 Pandemic [2]. In sports practice, various terms are used that reflect virtually the same concept—control exercises, control tests. In this study, we will use the term control exercises and results instead of the word norms.

## II. MATERIALS AND METHODS

Methods: Analysis of literature sources and scientific studies. Measuring experiment. Mathematical statistical analysis.

Speed in sports training is a person's ability to perform an action in minimal time. Three fundamental forms of speed are distinguished: movement reaction speed, speed

Online ISSN 2256-070X

<https://doi.org/10.17770/etr2025vol5.8478>

© 2025 The Author(s). Published by RTU PRESS.

This is an open access article under the [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

of individual movements, and frequency of movements [3], [4], [5], [6]. These forms of speed are relatively independent of each other. The transfer of speed from one manifestation type to another does not occur [5].

From a biological perspective, the possible movement speed depends on the amount of ATP in the muscles, the rate at which it is broken down under the influence of nerve impulses, and the rate of ATP resynthesis [7]. As emphasized by I. Liepiņš and I. Kīsis, rapid actions are primarily energetically supported by anaerobic mechanisms, with more than 90% in sprinting [3], [5]. Very fast movements are the result of complex central nervous system activity. The maximum movement frequency primarily depends on the functional state of the nervous system and individual characteristics [8]. I. Pontaga notes that movement frequency is somewhat related to the speed of individual movements because, to ensure a high step frequency, both the agonist and antagonist muscles must contract rapidly in alternation [8], [6]. The method for training movement speed is to perform movements/actions as quickly as possible, using the correct movement technique according to the sport [9]. Speed is determined by movement frequency and the distance covered in a single movement. Maximum speed can be achieved by: 1) choosing optimal relationships between these components mentioned above; 2) specifically increasing one or the other. For example, in running, maintaining a maximum step rate requires increasing the step length; if successful, the running speed increases. Additionally, a runner can achieve an increase in speed by increasing the tempo without reducing the step length [6]. A. Konrads states that in each sport, a person's speed abilities manifest differently. To assess them, specific control exercises unique to each sport must be performed. This is a complex task. In practice, running, especially sprinting, is primarily used as a means of evaluating speed characteristics [6].

In speed characteristic testing, the main measurement is the time indicating how quickly a runner completes a 20m distance. Knowing the distance and the time taken to cover it allows for the calculation of running speed. This is the absolute speed; to achieve maximum speed over the measurable distance, a run-up of at least 20-30 meters is necessary [6].

In sports practice, acceleration is also tested, or the athlete's ability to reach a higher running speed from a standstill as quickly as possible. The greater the acceleration, the better the result [6].

I.Kīsis emphasizes that, based on speed requirements, all sports can be divided into the following categories:

- Sports (sprint distances) that require the maximum development level of all forms of speed in standard situations.
- Sports (team sports) that require the maximum development level of all forms of speed in varied situations.

- Sports (weightlifting, gymnastics) that require a maximum, or near maximum, development level of specific forms under significant external load or complex coordination conditions.
- Sports (skiing, marathon) where the potential for speed expression is heavily limited by endurance [3].

When evaluating any physical qualities, various control exercises can be applied. In sports, the effectiveness of the training process is determined by the use of complex control means and methods as management tools, which ensure feedback between the coach and the athlete [10]. Control exercises should be performed at least twice during the season (at the beginning and end) and twice during training camps [3].

TABLE 1 PHYSICAL FITNESS ASSESSMENT SCALES FOR 18-YEAR-OLD BOYS [4]

Indicators and units	Low level	Medium low level	Medium level	Above med. level	High level
Scores	1	2	3	4	5
Jump (cm)	< 217	218-230	321-241	242-254	> 255
Hanging with bent arms (s)	<2 5.1	25.2-36	36.1-47.1	47.2-58.0	> 58.1
Run 10x5m (s)	> 20.2	20.1-19.3	19.2-18.2	18.1-17.5	< 17.4
Seat and reach (cm)	< 19	20-23	24-30	31-34	> 35
Hitting the board (s)	> 12.1	12.0-11.2	11.1-10.5	10.4-9.6	< 9.5
Sit-ups (count 30s)	< 25	26-27	28-29	31-32	> 33
30m run (s)	4.4	4.3	4.2	4.1	4.0
60m run (s)	8.6	8.5-8.3	8.2-8.1	8.0	7.9
300m run (min)	0:50	0:49-0:47	0:46-0:45	0:44-0:43	0:42
3000m run (min)	12:09	12:08-11:58	11:57-11:47	11:46-11:36	11:35
Bending and straightening the arms (count)	23	24-25	26-28	29-30	31
Hurdles (s)	16.9	16.8-16.5	16.4-16.3	16.2-16.0	15.9

Conditions for performing control exercises:

- Exercises should be performed in sports clothing and footwear;
- Exercises must be carried out in a strictly defined order as outlined in the physical fitness assessment, with rest periods between different tests performances;
- Before executing the exercise, athletes should be informed about the conditions of execution to reduce the impact of emotional factors on test results, allowing one attempt to familiarize themselves with the execution and ensure that the rules are understood (except for middle and long-distance tests);

- Exercises should be conducted in a competitive format, requiring precise and rapid execution [3].

Control Exercises “30m Sprint and 60m Sprint” – for determining running speed. A stopwatch is required for conducting the tests. Preparation for executing the test: athletes stand behind the line, placing one foot directly on the line (starting from the blocks). After the signal, they sprint as fast as possible to the finish line, which is located 30m or 60m away, and cross it. The stopwatch is stopped when the athlete crosses the finish line. The control exercises are performed simultaneously by two athletes. Results – sprint times in tenths of a second – are recorded on a results sheet. Each control exercise is conducted twice, and the best result is considered (K̄isis, 2015). The same method for determining running speed is used for the 20m and 100m sprints. Nowadays, the recording of control exercise results is done using electronic timing devices, rather than hand-held stopwatches, although using a hand-held stopwatch is not prohibited. The use of smartphones for recording results is not allowed.

I. K̄isis (2015) offers results that should be presented for 18-year-old boys (see Table 1). The results have 5 levels, which are informative for students to assess their level of preparedness. No equivalent results table is provided for girls.

A. Rudzītis and V. Lāriņš note that scientists from various countries have accumulated a considerable amount of information indicating that results applicable, for example, to adolescents and young adults in the northern European countries cannot be used in southern European countries or on the African continent [1]. The results are characterized by their representativeness, which means that it is still possible to develop results that can be applied to athletes from different geographical regions. Another aspect that interests researchers is the relevance of the results (norms, standards). In practice, it is accepted to review the results no less frequently than once every 10 years. This allows scientists to assess the trends in athlete development.

In 2008, A.Rudzītis et al. stated that in Latvia, no scientifically based norms had been developed in the last 10 years to evaluate the physical fitness of young athletes [1]. In the 2020/2021 academic year, the Ministry of Education and Science prepared and sent sports schools an informational material titled Control Standards for Groups of Professional Sports Education Institutions in the Context of the COVID-19 Pandemic [2].

TABLE 2 30M RUN RESULTS FOR 16 – TO 19-YEAR-OLDS (DAVIS, 2000) [11]

Gender	High level (s)	Above average level (s)	Average level (s)	Below average level (s)	Low level (s)
Male	< 4	4.0 – 4.2	4.3 – 4.4	4.5 – 4.6	> 4,6
Female	< 4,5	4.5 – 4.6	4.7 – 4.8	4.9 – 5.0	> 5.0

B. Davis (2000) published results from his country for young people aged 16 to 19 years (see Table 2)[11].

Comparing the assessment of the 30m sprint results presented by I. K̄isis (2015) and the results obtained during the 30m sprint by B. Davis (2000), we see that the results are very similar. A High-Performance level in both cases is 4.0 seconds; although the tests are different, the athlete can achieve a higher result during the sprint.

Based on the obtained results, it is possible to:

- compare the preparedness of individual students as well as groups of athletes;
- organize the selection for training groups;
- implement objective pedagogical control of the training process’s effectiveness;
- assess the appropriateness of training means, methods, and forms of organization;
- justify physical fitness standards [1].

With the help of control exercises, it is possible to determine absolute and relative indicators of physical attributes. Absolute indicators characterize the level of development of physical attributes, specifically the level of speed development in HP groups in this study.

Ethics. Before commencing the theoretical study, an opinion was received from the Ethics Committee of Riga Stradins University, No 2-PĒK-4/293/2025, stating that the research would be conducted in accordance with the regulations concerning the adherence to ethical norms in scientific research. The theoretical study took place from January 6, 2025, to January 31, 2025.

Theoretical analyses were conducted on control exercises for determining running speed among students in Professional Orientation Sports Schools’ HPS groups. The control exercises can help ascertain absolute and relative indicators of performance. Absolute indicators characterize the level of development of physical qualities; in this study, the focus was on the level of speed development among the HPS groups across four speed tests or control exercises. Running speed is considered an absolute or evident indicator [1]. These are simple control exercises according to the classification of control exercises; these exercises involve a single movement task – to cover a specified distance as quickly as possible.

In sports performance measurements, the limits of test results are considered the standard, which allows athletes to be categorized into specific qualification groups or levels of preparedness (Rudzītis et al., 2008).

The basis of the study was provided by the Cabinet of Ministers Regulation No. 508, “Procedure for State Funding of Professional Orientation Sports Education Institutions,” Appendix 1 – Requirements for Effectiveness Criteria [12].

The obtained data were processed using simple statistical methods, calculating the mean and standard deviation. The results were compared and analysed against the data mentioned in the literature.

### III.RESULTS AND DISCUSSION

Out of 36 sports, athletes in the HPS group must perform speed tests in 26 sports: a 20m sprint from a standing start, a 30m sprint from a standing start, a 60m sprint, and a 100m sprint from a standing start [2].

The 20m sprint from a standing start is included as a control exercise in the following sports in specialized sports schools: basketball, BMX, cycling, artistic gymnastics, and weightlifting. In these sports, there is a specific running action that authors mention in studies or articles, and, accordingly, the sports schools have chosen the corresponding exercise [2].

The 30m sprint from a standing start is included as a control exercise in the following sports in specialized sports schools: badminton, biathlon, boxing, cross-country skiing, judo, football, table tennis, handball, hockey, karate, fencing, rugby, tennis, volleyball, and Nordic combined [2].

The 60m sprint from a standing start is included as a control exercise in the following sports in specialized sports schools: boxing, figure skating, judo, karate, rugby, and athletics [2].

The 100m sprint from a standing start is included as a control exercise in the following sports in specialized sports schools: sailing, judo, karate, modern pentathlon, orienteering, and short track [2].

From the above, it can be seen that the most popular control exercise is the 30m sprint from a standing start. Not all sports mention performance results for women and men. Results in specialized sports such as boxing, judo, football, hockey, karate, rugby, and Nordic combined are only available for men.

In the 30m sprint from a standing start, the highest results for HPS groups are noted in Nordic combined and rugby for men – 4.0 seconds (see Fig.1).

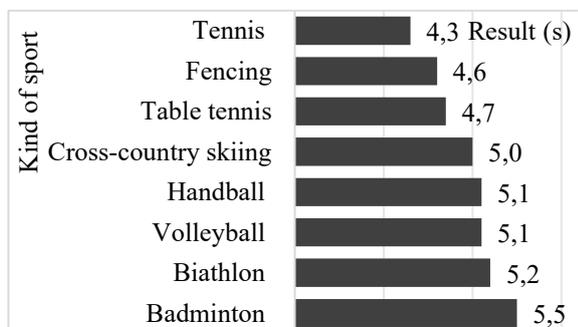


Fig. 1. Results in the women's 30m run.

For women, the fastest result in the 30m sprint is recorded in table tennis – 4.3 seconds (see Fig.2). The

average result for men in the 30m sprint is  $4.8 \pm 0.19$  seconds and for women, it is  $5.1 \pm 0.33$  seconds.

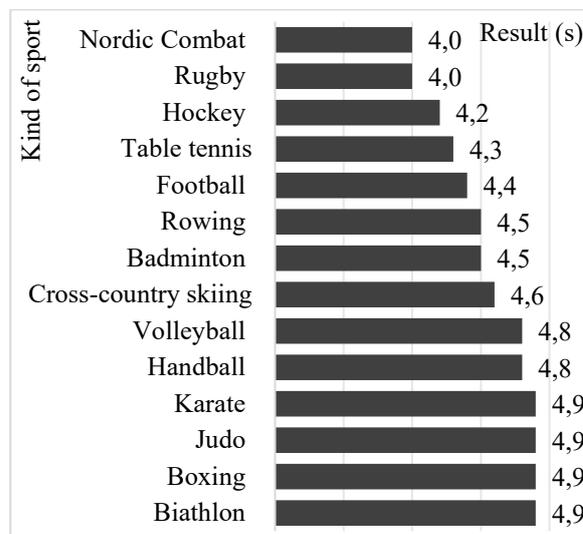


Fig. 2. Results in the men's 30m run.

The best results in the 60-meter sprint for both men and women should be presented by track and field athletes – sprinters and jumpers. 7.7 seconds for men and 8.7 seconds for women. The average result in the 60-meter sprint is  $8.6 \pm 0.5$  seconds for men and  $9.0 \pm 0.21$  seconds for women (see Fig. 3 and Fig. 4).

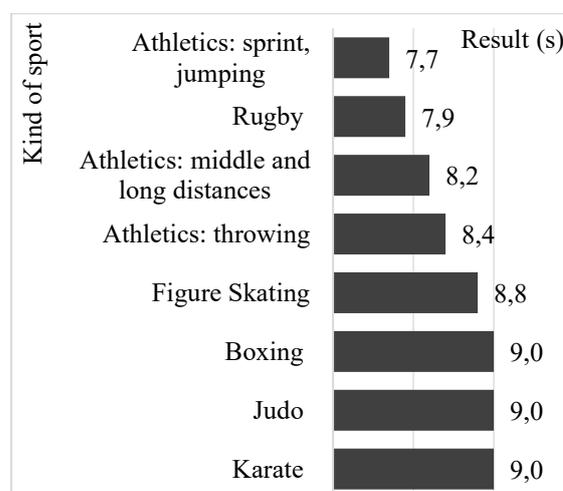


Fig. 3. Results in men's 60m run.

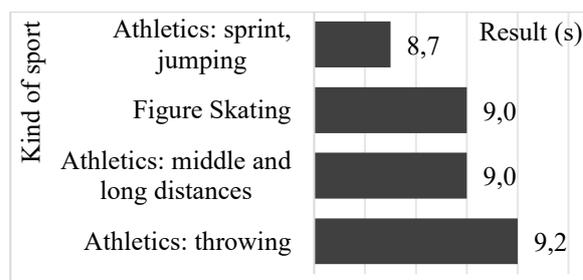


Fig. 4 Results in the women's 60m run.

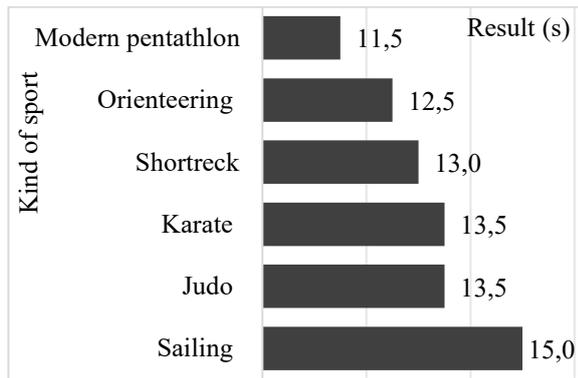


Fig. 5. Results in men's 100m run.

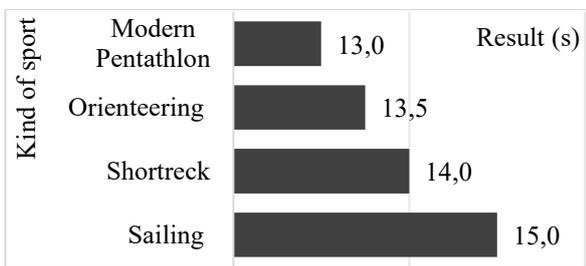


Fig. 6. Results in women's 100m run.

In the 100-meter sprint, the average result for men is  $13.3 \pm 1.25$  seconds and for women it is  $14.0 \pm 1.0$  seconds. The fastest times in the 100 meters for both men and women should be shown in modern pentathlon – 11.5 and 13.0 seconds, respectively (see Fig. 5 and Fig. 6).

The highest standards for HPS groups in the 20m sprint for men are set at 3.0 seconds in gymnastics (see Fig. 7), while for women in weightlifting, it is 3.2 seconds (see Fig. 8). The average result in sports where the speed test for the HPS group is a 20-meter sprint from a standing start is  $3.5 \pm 0.19$  seconds for men and  $3.6 \pm 0.19$  seconds for women.

In summary, as previously described, we can observe that sports federations choose the 30m sprint as a control exercise—14 sports for men and 8 sports for women (see Table 3). The numerical values of other speed control exercises can be seen in the same table.

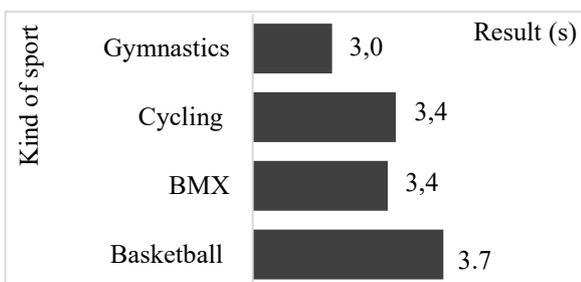


Fig. 7. Results in men's 20m run.

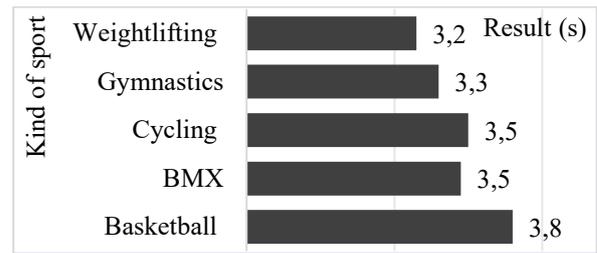


Fig. 8. Results in the women's 20m run.

Analysing the differences in the results of the indicated control exercises in different sports, it should be concluded that they are significant. It can also be concluded that in most sports there are minimal requirements for achieving high-quality results in speed control exercises. Such differences are explained by the fact that the results of the control exercises to be achieved are determined by the federations of each sport at their own discretion, based on different principles. The control exercises offered by sports federations shall be performed at least once a year and approved by the Ministry of Education and Science, and they shall be considered as corresponding to the specifics of the sport, as well as shall be executed by students of the High-Performance Sport group.

#### IV. CONCLUSIONS

Analysing the differences in the results of the specified control exercises across various sports, it can be concluded that these differences are significant. It can also be inferred that in most sports, the requirements for achieving high-quality results in control exercises are minimal. Such differences can be explained by the fact that the target results for control exercises are determined by the federation of each sport at their discretion, based on different principles. The control exercises proposed by the sports federations must be performed at least once a year and are approved by the Ministry of Education and Science; they are considered appropriate to the specifics of the sport and are executable by the trainees of the High-Performance Sport group.

There is no specific measuring instrument for recording results. This can be done with a handheld stopwatch or by using specialized timing electronic devices. It should also be noted that there is no standardized terminology for the representation of control exercises and results in literature data.

A debatable question is whether the running speed control exercises are suitable for all sports in which they are used. In the HPS groups of sports schools, the greatest emphasis in physical preparation is placed on special fitness, and the correlation between fast running and competition results is minimal in most sports. For the youngest groups of trainees, the results of short distance running and their dynamics are significantly more important. Of course, there are sports (athletics, football,

rugby) where movement speed is very important for achieving high performance in competitions.

#### REFERENCES

- [1] A. Rudzītis un V. Lāriņš, "Basketbolistu fiziskās sagatavotības kontrole un rezultāti", Bērnu un pusaudžu trenera rokasgrāmata, Rīga: LTTC, 2008, 124-137 lpp.
- [2] Profesionālās ievirzes sporta izglītības iestāžu grupu kontrolnormatīvi COVID – 19 pandēmijas apstākļos (2020), Informatīvais materiāls Latvijas profesionālās ievirzes sporta izglītības iestādēm 2020/2021 m.g.,
- [3] I. Ķīsis, Sporta teorija 2. daļa, Rīga: LSPA, 2002, 24-25 lpp.
- [4] I. Ķīsis, "Fiziskās sagatavotības noteikšana un novērtēšana" Vispusīgās fiziskās sagatavotības trenera rokasgrāmata, Rīga: SIA DUE, 2015, 28-30, 33, 41 lpp.
- [5] I. Liepiņš, Ātrums un tā attīstīšana, *Sports un treniņš*, Rīga: autora izdevums, 2000, 181.-182. lpp.
- [6] A. Konrads, "Ātruma treniņš", Trenera rokasgrāmata, Rīga: LTTC, 2003, 68-69 lpp.
- [7] F. Bosch and R. Klomp, Generation of energy. Running. Biomechanics and Exercise Physiology Applied in Practice. Churchill Livingstone, Elsevier, 2007, pp. 83 – 84.
- [8] I. Pontaga, Spēka, spēka izturības, ātrspēka un ātruma attīstīšanas fizioloģiskais pamatojums. 1.daļa, Rīga LSPA, 2023, 56-58 lpp.
- [9] C. Boreham, The Physiology of Sprit and Power Training. Chapter 6 in: *The Physiology of Training*, Churchill Livingstone, Elsevier, 2006, pp. 117-134.
- [10] A. Fernāte, Fiziskā sagatavošana, Sporta treniņu teorijas pamati. 2.daļa, Rīga: LSPA, 2002, 15, 73 lpp.
- [11] B. Davis, Physical Education and the study of sport. 4th ed. London: Harcourt Publishers, 2000, p. 125.
- [12] Ministru kabineta noteikumi Nr. 885, Rīgā 2021. gada 21. decembrī (prot. Nr. 81 79. §) Kārtība, kādā valsts finansē profesionālās ievirzes sporta izglītības programmas, pieejams: [www.likumi.lv](http://www.likumi.lv) Kārtība, kādā valsts finansē profesionālās ievirzes sporta izglītības programmas [Skatīts: 2025.gada 13.janvarī].