STUDY OF THE IMPACT OF THE MOTOR CHARACTERISTICS OF SPEED ON THE AGE PECULIARITIES

Korneliya Naydenova & Dilyana Nancheva

National Sports Academy „Vassil Levski”, Sofia, Bulgaria

ABSTRACT

Studying motor qualities and their different performance aspects is one of the main goals of experts in physical education and sport. Determining the peculiarities of motor qualities performance, especially speed is the result of numerous tests which reveal lowered levels of both motor and physical activity of children. Taking into account the fact that the quality of speed is one of the basic goals in teaching physical education and sport at school, studying its changes along with the age development of the students is fundamental for the selection of methods and resources for its purposefully development during the lessons.

Based on the above-mentioned facts, the aim of the current study is to trace the changes and their impact on the speed quality with schoolgirls via a 30-metre-race test. In order to achieve the aim, we set the following tasks:

- 1. Reading about the problem in scientific sources.*
- 2. Processing the results of the 30-metre-race test of the girls whose personal data were taken for the research project, performed in 2018.*
- 3. Revealing the impact peculiarities of the speed quality with schoolgirls in the aspect of age.*

We fulfilled our study tasks by statistic processing the achievements of the girls aged 6 – 18 from 28 schools in 22 towns in the country, having participated in the 30-metre-race test. We applied a variation and comparative analysis which allowed us to specify the impact peculiarities of the motor quality in its age aspect.

After processing and analysing the results of the study we found a lot of changes in the speed performance with schoolgirls. These changes showed different periods of intense development of the quality, based on the increased results among the different ages. On the grounds of the above-mentioned results we recommend the use of specific means and methods to improve the effect on speed in school age.

Key words: motor quality, schoolgirls, physical activity

INTRODUCTION

The school age is a period of development of the individual, which is saturated with a number of changes related to the growth and development of the person. These changes are affected by the child's learning, lifestyle and age. Authors such as Geshev, et al., 1965; Zhelyazkov & Dasheva, 2002; Kolev, 2002, Dimov, et al 2004, Mardov, 2008 argue that the effectiveness of teaching and training is largely determined by the age of the trainees. On the contrary, Haywood & Getchell (2001) share the opinion that the individual characteristics of the person are more important for the development of the child, not only their age.

The motor quality of speed is one of the motor abilities of a person which has a wide manifestation in the human daily activities, and it is a major component of the physical capacity. Physical capacity in

turn has to do with the lifestyle of the individual. In this regard Ignatov (2016) states that the physical development and physical fitness of young people during the period of their studies have a great influence in the construction of their identity, as well as their quality of life in the future. This is also one of the reasons that the discussed quality is an essential part of the educational content of the subject Physical Education and Sport, as stated by Bachvarov (1991). The changes and peculiarities of the pace of development of speed in the aspect of age are the basis both in planning the teaching process in physical education and in the construction of the separate stages in the multi-year sports training.

Studies on the peculiarities of manifestation of motor qualities in the age aspect have been carried out by authors such as Alipieva, 1981; Rachev, 1992; Fomin & Filin, 1975; Malina & Baunenal, 1991;

Haywood & Getchell, 2001. However, no targeted studies have been conducted in the country over the last 30 years to track age-related changes in motor performance.

Aim and objectives of the study

Based on what has been said above, we set the task to track changes in the manifestation of motor quality of speed with schoolgirls using the 30-metres running test. To achieve this goal, we set the following tasks:

- Study the problem by literary sources.
- Processing the results of the 30-metre running test done by females, whose data were taken during a research project conducted in 2018.
- Detecting the peculiarities of the manifestation of motor quality of speed with schoolgirls.

Based on the presented goals and objectives of the study, the subject was to determine the state of motor quality of speed with schoolgirls between 6 and 18 years of age. The object of the study is the changes that occur in the examined motor quality during the 12-year period.

METHODS

The survey was conducted in the autumn of 2018 as part of a project on establishing the level of physical capacity of the pupils in the country. The results processed and analyzed in this article reflect the achievements of a total of 4,377 female students between the ages of 6 and 18 from 22 schools in 28 towns in the country. The detailed distribution by age of the studied contingent is presented in Table 1.

Table 1. *Contingent of the survey*

Age	6	7	8	9	10	11	12	13	14	15	16	17	18
Count	35	284	363	357	448	484	448	370	354	370	336	302	226

All 4,377 female pupils were subjected to a single 30-metre running test from a high start. The test results were processed using the statistical software SPSS.20. The data were subjected to a variational and comparative analysis.

RESULTS

We will start the analysis of the results obtained from the study with interpretation of the indicators of the variational analysis, whose values are presented in Table 2. We are also interested in the values of the coefficient of variation (V%) which range between 9.32% and 13.92% for the considered age group. In all cases the values of the discussed coefficient fall within the limits which determine the

samples to be highly homogeneous. Another thing that makes an impression is the gradual decrease of the coefficient of variation between the ages of 6 and 10 after which there is an opposite tendency to increase the values of the coefficient.

Despite the uniformity of the group, however, the distribution of values for the separate girl groups cannot be determined as normal, since the values of the coefficients of asymmetry (As) and excess (Ex) exceed the table values with small exceptions. In all the cases considered the value of the asymmetry coefficient (As) is positive, which means that the achievements of the schoolgirls from all groups is centered around the upper bound and it marks the lowest achievements in terms of the estimated motor quality.

Table 2. *Indicators of variational analysis*

Age	n	R	Xmin	Xmax	X	V%	s	As	Ex
6	35	5.570	6.350	11.920	7.661	12.165	0.932	3.003	12.596
7	284	6.360	5.380	11.740	7.587	12.705	0.964	1.190	2.808
8	363	5.910	5.270	11.180	7.031	11.97	0.842	0.896	1.619
9	357	4.830	4.310	9.140	6.566	11.483	0.754	0.378	0.346
10	448	3.750	4.770	8.520	6.383	9.321	0.595	0.468	0.813
11	484	4.670	4.290	8.960	6.157	10.687	0.658	0.857	1.380
12	448	4.610	4.480	9.090	6.026	10.786	0.650	0.984	2.038
13	370	5.080	4.470	9.550	5.919	11.331	0.671	1.026	3.123
14	354	5.160	4.400	9.560	5.821	11.303	0.658	1.490	4.940
15	370	5.050	4.360	9.410	5.770	12.270	0.708	1.084	2.327
16	336	4.270	4.190	8.460	5.802	12.685	0.736	0.542	0.624
17	302	4.900	4.280	9.180	5.829	12.609	0.735	1.158	2.477
18	226	5.500	4.250	9.750	6.041	13.938	0.842	1.289	3.126

From the variational analysis it is obvious that the most significant indicator is the arithmetic mean value of the achievements, which we present in

Figure 1. The Figure shows a gradual decrease in the values of the indicator up to the age of 15, after which it marks a gradual increase.

Figure 1. Average Achievements in Test Running 30 m

The highest value of the increase in the achievements of the students at the 30-metre running test is observed between 7 – 8 and 8-9 years of age, where the value of the differences is respectively 0.55 and 0.46 seconds. The validity of the detected differences in achievements was checked with the Mann-Whitney test, due to the lack of a normal distribution of values. The value of a in both cases is 0.000, which means that the growth is statistically reliable and is a consequence of the age characteristics of the development and its associated processes of growth and development.

The total increase in achievement girls aged 7 and 9 is 1.1 sec. This increase is almost equal to the growth of achievement over the next 5 years, namely between the ages of 9 and 14, whose value is 1.2 sec. Over the next 3 years between the ages of 15 and 18 the time to cover the 30-metre distance increases. This increase means that the achievement of the 18-year-olds is deteriorated, and it is almost equal to the achievement of the 11-year-old students for the same distance.

Examination of the statistical validity of the achievements with female students showed its presence in the comparisons between the different ages consecutively up to the age of 15, after which the

differences are insignificant. This trend coincides with the improvement of age achievement and the improvement of homogeneity.

DISCUSSION

The analysis of results obtained from the study gives us the reason to make the following conclusions:

- Improvement the achievements of the 30-metre running test until the age of 15 is observed with Bulgarian schoolgirls.
- We find the highest value of achievement between the ages of 7 and 9.
- Taking into account the values of the calculated and interpreted statistical indicators, we can conclude that the period between the ages of 7 and 9 is crucial in the development of the motor quality of speed with schoolgirls.

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Corresponding authors:

Korneliya Naydenova

Department of Theory of Physical Education
National Sports Academy „Vassil Levski”
Studentski grad, 21,
Acad. Stefan Mladenov str.
Sofia 1700, Bulgaria
E-mail: knaidenova.nsa@gmail.com