

Features and Age Dynamics of 10–14 Years Old Schoolgirls in Physical Fitness With Consideration of Individualities' Bodybuild

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Abstract – The study of the physical fitness of schoolchildren is an actual problem of the theory and practice of physical education as its level largely determines the level of the physical condition of children and adolescents. The work describes the age dynamics of physical fitness of 10–14 year-old schoolgirls with various bodybuilds. Moreover, the analysis of the level of development of individual physical qualities for representatives of astheno-thoracic, muscular and digestive builds was conducted. The obtained results can be used in the practical work of physical education teachers, children's coaches, school health protection specialists, as well as for students of physical culture and sports universities.

Key words - somatic health, fitness group, bodybuilds, physical fitness

I. INTRODUCTION

The level of physical fitness is an integral indicator of human physical health. Knowledge of the motor fitness features of children and adolescents with various bodybuilds has an important practical value as they must be taken into account at the rational organization not only of the sport – training process, but also health-promoting exercises [1].

According to some authors [1–3, 5–7, 9] during puberty, compared with other periods, schoolchildren have the most intensive development of motor qualities. The rates of girls' motor qualities development differ significantly from those of boys [7]. The teenage period of girls aged 10–14 is associated with puberty, which comes 1–2 years ahead than among boys. This period covers II–IV stages of puberty. Girls aged 10–12 have limited aerobic capacities even in comparison with younger schoolgirls, therefore the center of gravity of classes has to be transferred to the development of speed-power skills and dexterity. At the age of 12–14, the endurance training gives a good effect [1–2, 6–8].

Realizing importance of schoolgirls' physical fitness study, we conducted the research which purpose was the studying of features and age dynamics of physical fitness of 10–14 year-old schoolgirls taking into account their build peculiarities.

II. ORGANIZATION AND RESEARCH METHODS

All research conducted within the real work is carried out with fifth-eighth grade girls. 158 schoolgirls aged 10–14 participated in the research. All of them were carried to the main medical group and they had no sharp diseases during the experiment.

In the work the pedagogical and medico-biological methods suitable for the research of physical development and physical fitness of middle – school aged children were used: theoretical analysis and synthesis of scientific and methodical literature data; medico-biological methods (anthropometry [4]), definition of bodybuilds [10]); pedagogical methods (timekeeping, pedagogical check tests).

III. RESULTS AND DISCUSSION

According to the purpose we estimated growth rates of motor development of our examinees within the academic year. For this purpose the tables and charts parrying changes of gains of each indicator were constructed.

In figure 1 age changes of physical fitness indicators of 10–14 years old schoolgirls of astheno-thoracic (A-T), muscular (M) and digestive (D) builds are presented.

During the teenage period for girls of A-T and M-D physical builds the results of implementation of motor tests increase staying dynamometry (by 40.49 and 49.67 %, respectively), hand dynamometry (35.87 and 51.7 %, respectively) and in sit-ups, hand behind the head for 30 seconds (52.72 and 32.87 %, respectively).

respectively), and the lowest results – run of 1000 meters (by 6.16 and 12.65 %, respectively).

High-speed power abilities grow at the greatest rates in girls of astheno-thoracic type of the physical build, and

coordination abilities, power indicators, endurance and flexibility – in representatives of muscular – digestive builds (Fig. 2, 3).

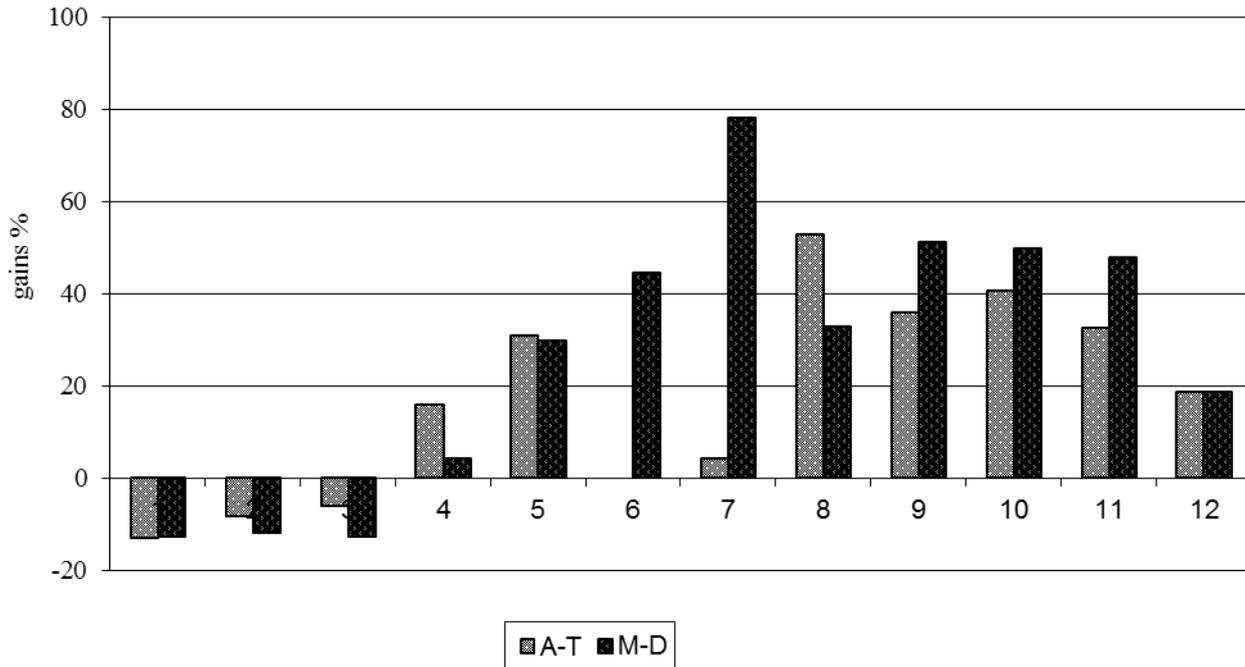


Fig. 1. Gains of physical fitness indicators of schoolgirls aged from 10 to 14 of different bodybuilds. On ordinate axis – % gains. On abscissa axis – indicators of physical fitness: 1 – running of 30 m; 2 – running of 3x10 m; 3 – running of 1000 m; 4 – long – jump (standing); 5 – backward jump (standing); 6 – pull-ups; 7 – push-ups (press); 8 – sit – ups for 30 seconds; 9 – hand force; 10 – staying power; 11 – bend forward (sitting); 12 – the falling ruler

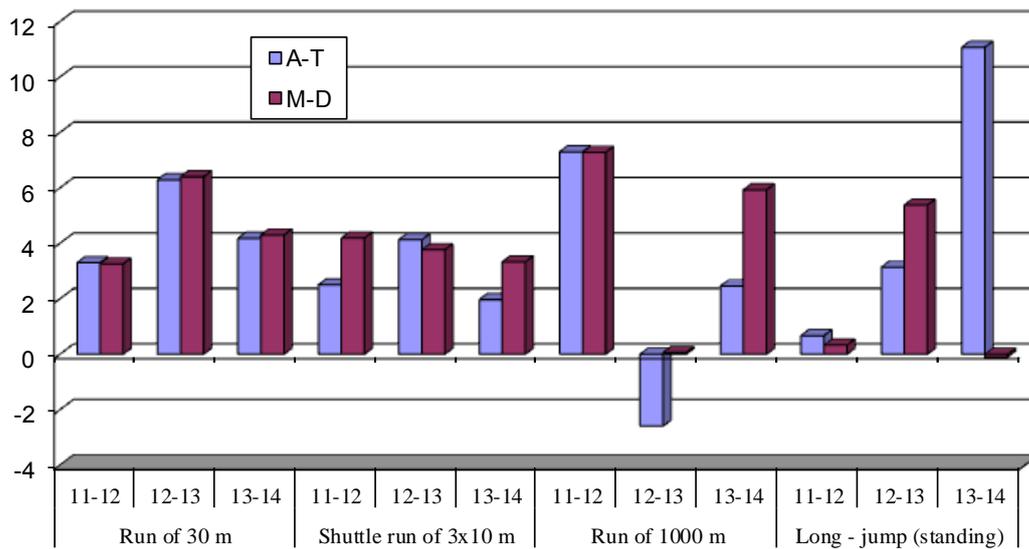


Fig. 2. Gains of physical fitness of girls aged 11–14 of different physical build types

High-speed skills and endurance grow the most intensively among schoolgirls aged 11–12 of the astheno-thoracic somatotype, and among girls of the muscular and digestive somatotype a year late. As for coordination abilities and

flexibility, their earlier development is observed in schoolgirls of the muscular and digestive somatotypes (Fig. 2, 3).

Reliable distinctions are found by the results of such tests as: run of 1000 meters, staying dynamometry, hand dynamometry (Fig. 2, 3).

Results of the recent research estimate that the most important typological signs in physical training are features of the physical build types and closely related structure of motility [2, 5–7, 9].

In this connection, the study of the motility structure of schoolgirls aged 10–13 was carried out. Calculation of the rating scale by each indicator was calculated by the algorithm

on the basis of the sigma deviations. The step was 0.67δ . In total we estimated 9 indicators on the scale. Assessment of each indicator on the scale was made by a five-point scale.

Thanks to this algorithm, individual properties of motility of each schoolgirl were estimated and all of them were distributed to two typological groups (A-T and M-D).

Features of the girls' motility structure having various build types are presented in figure 4.

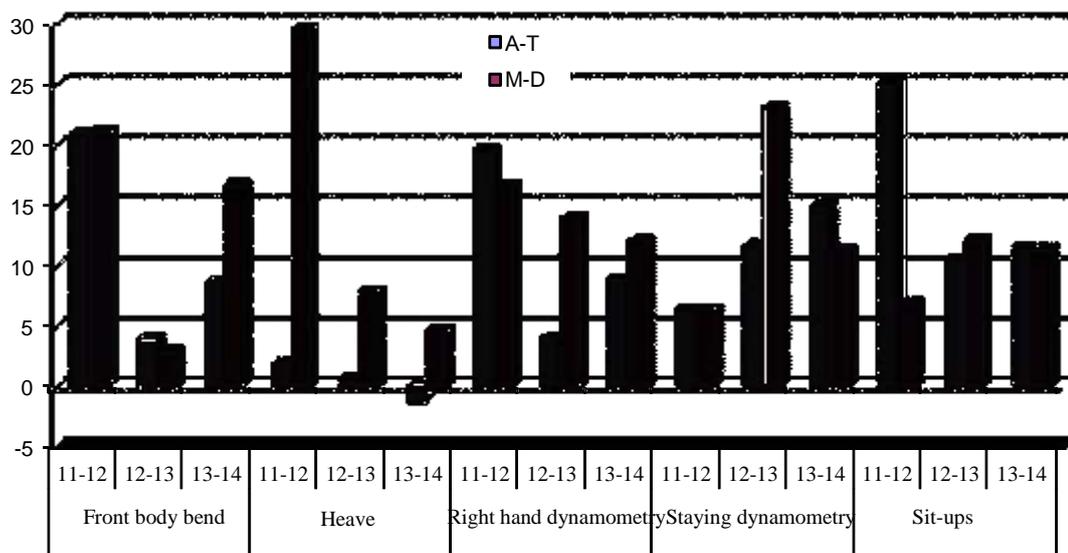


Fig. 3. Gains of physical fitness of girls aged 11–14 of different physical build types

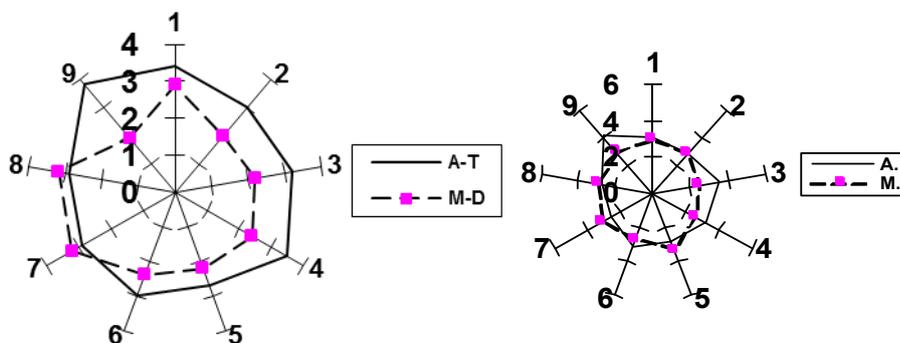


Fig. 4. Typical motility profiles of girls aged 11–14 of astheno – thoracic and muscular-digestive physical build types
 Note: the results of each test are rated on a five-point scale. 1 – run of 30 meters; 2 – shuttle run of 3 x10 m; 3 – long – jump (standing); 4 – backward jump (standing); 5 – front body bend; 6 – heave; 7 – hand force; 8 – staying force; 9 – run of 1000 m

IV. CONCLUSION

On the basis of the charts analysis of physical motor fitness of girls aged 10–13 it may be concluded that the most developed (leading) physical quality of representatives of the astheno-thoracic physical build is an endurance, and for girls of the muscular-digestive physical build – power and high-speed qualities.

Regardless of age, schoolgirls of muscular and digestive physical build types have great power abilities and flexibility,

and the schoolgirls having astheno-thoracic physical build type are hardier and more coordinated.

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