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**COMPETITIVE ACTIVITY ANALYSIS OF HIGHLY QUALIFIED
FEMALE ATHLETES SPECIALIZING IN MODERN PENTATHLON
IN THE AGE ASPECT**

The article is devoted to the study of the age dynamics of the competitive activity of the strongest female athletes in the world specializing in modern pentathlon. The analysis of competitive activity made it possible to identify the main trends in the dynamics of its structural elements in the age aspect. The periods of increase in the result were determined. The most significant of them can be considered age periods 19–20, 25–26 years. The stability of age dynamics is observed both in the result and in the contribution to the total point amount of pentathlon in fencing and the combined relay. In swimming and show jumping, with the instability of the result, a decrease in the contribution of these types of sport to the overall result is observed. The results obtained can serve as a guide for specialists in improving the "road map" of the long-term training of female athletes specializing in modern pentathlon.

The essence of the functioning of the system of high-class athletes training lies in the need for the manifestation of motor abilities in their optimal combination in extreme conditions, which are the main competitions. In this regard, a special role is given to a clear definition of the goal and management of the process of sports training.

In recent years, the interest of specialists in the analysis of the specifics of the competitive activity of athletes has increased, the study of which in individual and team sports has received quite a lot of attention in the special literature [1; 2]. However, information related to competitive activity in complex types of competitions – all-around events, which are distinguished by an extreme variety and complexity of requirements for the manifestation of special physical, tactical, technical, and psychological preparedness by athletes is clearly insufficient. All-around athletes must have a whole complex of seemingly incompatible motor abilities, which are typical for athletes performing in events dedicated to separate types of sport [1; 3; 4].

Many specialists have been studying the structure of competitive activity in the types of sports all-around. In particular, they determined the competitive models of athletes of various qualifications, analyzed the relationship between the sum of points in the track-and-field heptathlon and the results of certain types of the all-around, compared the features of the contribution to the competitive result of the heptathlon of the results in individual types and groups of types included in it, their features and its interrelationships among the strongest female athletes of the world [1; 3; 5].

A group of authors devoted their work to determining the features of the structure of the competitive activity of qualified pentathletes [6; 7; 8].

Despite the variety of approaches to the study of competitive activity in sports all-around, there are practically no studies devoted to the study of the dynamics of competitive activity of qualified female athletes in the age aspect.

The purpose of the study: to study the dynamics of the competitive activity of the world's strongest female athletes specializing in modern pentathlon in the age aspect.

To achieve our goal, we analyzed the results shown by highly qualified athletes in major competitions (World Championships, World Cup finals, the Olympic Games 2016, 2020) over a ten-year period.

Figure 1 shows the competitive performance of the strongest female pentathletes in the world. It can be seen from the graph that the growth of the average indicator occurs almost linearly. However, several age periods can be distinguished, where spasmodic changes in the result are noted. At the age of 18-19 years, the most significant, reliable increase in the average indicator of competitive activity by 33.67 points is observed, which is 2.74%.

The second significant increase in the total sum of all-around points is observed at the age of 19 to 20 years – 13.32 points. According to the authors, at this age athletes stabilize their technical skills, which allows them to show results in certain events that are close to personal records [3]. It is worth noting that a number of female athletes of the above age, who showed the highest sports result at the level of 1330 points, did not even come close to this number of points in the future, which suggests that the training process was forced, which further negatively affects the continuation of their sports career.

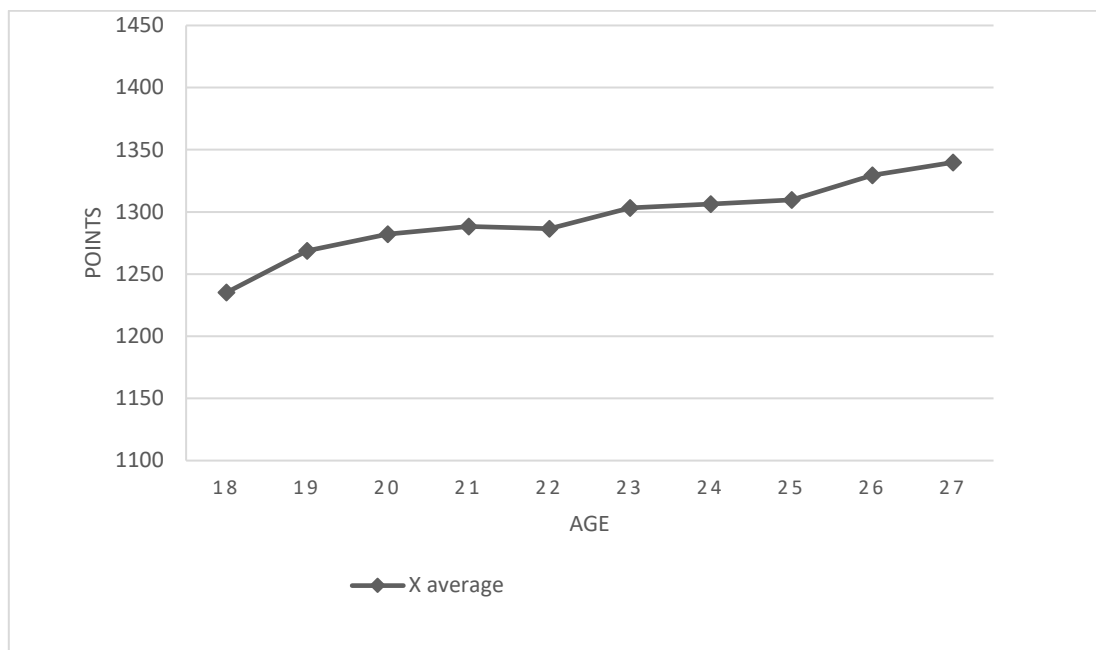


Figure 1 – Age dynamics of sports results of highly qualified female athletes specializing in modern pentathlon

The next significant increase in results falls on the period of 22–23 years (16.7 points). In this age period, the highest difference between the minimum (1241.4) and maximum (1359.7) results – 118.3 points was noted.

Further, in the period up to 25 years, there is a slight increase in the result (less than 1%), except for the period of 21–22 years, where there is a slight decrease in the result (-1.95 points).

At the age of 26, there is the next significant increase in the competitive performance of all-around events by 19.65 points – 1329.45 points in total.

Then, at the age of 27 years, there is a further improvement in the result by 10.41 points (1339.86±26.40).

According to the authors of [3], in the preparation of all-round events, attention should be paid not so much to the total amount of points, but how this amount is gained, that is, the contribution of individual types. We have studied the relationship between the results in the types of pentathlon and the total amount of points.

Tables 1 and 2 show that the difference between the largest contribution of points to the total amount of the combined relay (40.57%) and the smallest contribution – fencing (15.54%) was more than 25%. This is the maximum difference between individual types of sport for the entire period under consideration.

Table 1 – The structure of competitive activity of the strongest female athletes specializing in modern pentathlon

Age	Fencing		Swimming		Show jumping	
	Result, points	Contribution, %	Result, points	Contribution, %	Result, points	Contribution, %
18	193,67± 17,04	15,54	273,00± 8,92	22,10	270,00± 25,81	21,79
19	201,55± 23,18	15,90	272,64± 14,68	21,51	288,00± 12,17	22,72
20	206,56± 23,04	16,15	277,44± 13,03	21,69	286,87± 9,27	22,39
21	209,53± 23,29	16,47	277,13± 12,62	21,62	283,33± 20,08	22,21
22	214,38± 16,11	16,56	272,69± 13,18	21,10	281,13± 21,28	21,86
23	214,00± 22,91	16,49	277,67± 11,51	21,31	289,83± 6,58	22,25
24	216,59± 22,59	16,59	276,55± 14,68	21,18	286,30± 11,09	21,92
25	218,36± 25,26	16,78	279,36± 9,74	21,33	280,80± 10,33	21,54
26	224,82± 19,00	16,89	275,36± 9,90	20,71	289,91± 3,62	21,79
27	226,29± 17,10	16,90	283,71± 9,29	20,78	286,67± 9,1	21,30

Table 2 – The structure of competitive activity of the strongest female athletes specializing in modern pentathlon

Age	Combined relay		Final result	
	Result, points	Contribution, %	Result, points	V%
18	501,83± 19,88	40,57	1235,00± 53,78	3,8
19	504,27± 38,07	39,78	1268,88± 24,40	3,14
20	509,44± 39,10	39,78	1282,20± 42,76	3,34
21	507,93± 32,73	39,71	1288,41± 31,51	3,48
22	521,06± 34,17	40,48	1286,47± 52,75	3,91
23	517,50± 31,11	39,95	1303,17± 47,03	3,33
24	522,55± 27,44	40,01	1306,30± 32,08	2,46
25	525,73± 28,84	40,35	1309,80± 23,07	2,6
26	540,18± 26,75	40,61	1329,45± 38,96	2,93
27	549,71± 20,18	41,02	1339,86± 26,40	1,97

In the age aspect, over the entire period of research, the contribution of swimming decreased from 22.10% to 20.78%, the contribution of fencing, on the other hand, increased from 15.54% to 16.90%.

In show jumping, the contribution as a percentage did not change significantly (0.15%). The loss of contribution of swimming is explained by a significant increase in the contribution to the total amount of points of fencing and relay. Overall, there is an increase in the result in all types. The greatest increase in the result is observed in the combined relay – 47.88 points.

In fencing, the result increased by 32.62 points, swimming by 10.71, show jumping by 16.67 points. The difference in the rate of absolute growth can be associated with the peculiarities of the training of female athletes at a given age.

In the process of research, the highest variability (V%) was found in pentathletes aged 18, the lowest – aged 27. However, the degree of dispersion of data in all age groups is insignificant.

The analysis of the competitive activity of the strongest pentathlon female athletes made it possible to identify the main trends in the dynamics of its structural elements in the age aspect. The main periods of a significant increase in the result in the modern pentathlon were determined. The most significant of them can be considered age periods 19–20, 25–26 years. The stability of age dynamics is observed both as a result and in the contribution to the total amount of the pentathlon in

fencing and the combined relay. In swimming and show jumping, with the instability of the result, a decrease in the contribution of these types to the overall result is observed.

Thus, the results obtained can serve as a guide for specialists in improving the "road map" of the long-term training of female athletes specializing in modern pentathlon. In this case, one should take into account the individual characteristics of a particular all-around event and rely more on its leading motor abilities.

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E. A. Osipenko

THE FUNCTIONING OF THE SCIENTIFIC SCHOOL OF G. I. NARSKIN «PHYSICAL EDUCATION AND SPORTS TRAINING» AS A FACTOR IN THE MODERNIZATION OF HIGHER PHYSICAL EDUCATION

In existing practice, the concept of a scientific school is often used broadly: a school approaches a theoretical approach, a successfully operating organizational structure, and a center for research on a particular topic. The key feature of a school in the science of science is the existence of an independent research program and direct communication links, including those between generations. These features make it possible to unambiguously distinguish a scientific school both from a scientific direction and from other types of scientific communities. The emergence and success of the development of a scientific school depend on a complex of objective and subjective conditions, which must be taken into account in the social and legal regulation of the activities of scientific schools.

The article presents the results of the functioning of the scientific school of Doctor of Pedagogical Sciences, Professor Gennady Ivanovich Narskin.