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TECHNOLOGY FOR DETERMINING THE MOST SIGNIFICANT INDICATORS OF THE TRAINING LOAD OF GYMNASTS AT THE COMPETITIVE STAGE OF PREPARATION

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ABSTRACT

An important part of the presented article is the results of the correlation analysis of the indicators of training load that most affect the management efficiency of the training process of highly qualified gymnasts at the competitive preparation stage.

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Introduction. The most important place in the training system, both beginners and highly qualified gymnasts, is physical and technical training, associated primarily with the development of a large circle of systematically complex and improving exercises.

The exercises that make up the program material of special technical training (STT) are mastered on the basis of a technique that has certain specific features. It boils down to the need to apply a number of methods that allow for the implementation of training and training in the most efficient and effective (1,2,7). Factor analysis as a statistical method is used quite widely in the studies of many sports. In gymnastics, the high efficiency of this method was shown in the works of Arkaeva L.Ya., Suchilina N.G. (one); Yu.K. Gaverdovsky in co-author (2); Rosina E.Yu. (3); Khasanova G.M. (6); Cheburaeva V.S. (7) to identify factors on the indicators of sports and technical (STP) and special physical training (SPhT), and the formation of the structure of the motor activity of highly qualified gymnasts and gymnasts (1,5,6,7).

Purpose of the study. Determination of the most significant indicators of training load of gymnasts at the competitive stage of preparation.

In our study, the use of factor analysis is justified by the fact that when preparing highly qualified gymnasts for competitions and to achieve success in them, it is necessary to take into account training loads on which sports and technical results depend (1,5,6,7).

Research results. The study was conducted with 17 highly qualified gymnasts at a competitive stage of preparation for 7 competitions 2016-2017. 22 of the most significant indicators of training loads were recorded, with sufficient completeness reflecting the course of preparation for competitions. In all competitions, athletes performed successfully, fulfilling the requirements of the corresponding category in all-around and in individual forms.

The obtained data were processed using the principal component method with varimax rotation of the factor matrix using the WINDOWS –EXSEL computer program. The correlation coefficient was calculated by the Student.

Correlation analysis can be viewed as a preliminary procedure of factor analysis, associated with the selection of groups of closely correlated indicators of training loads of gymnasts.

The correlation matrix obtained at the first stage was transformed into a matrix of factor weights. As a result of the factorization of 22 indicators of training loads that do not have the most significant information about the phenomenon under investigation, 5 factors were identified that have different contributions to the total variance. To interpret the results of factor analysis, the essence of the factors was revealed, and on this basis their names were determined; analyzed the uneven distribution of factor weights by factors.

It should be noted that in the presented matrix of factor weights of the components of the training load, there are indicators 12 and 5: the total number of combinations performed and the number of stable combinations (tab.). They characterize the most significant aspects of preparing gymnasts for competitions and at a high level are interconnected with the main groups of the sample (from r = 0.829 to r = 0.967).

In the process of research, five factors with different percentage contribution of each of them to the total variance: factors of the number of completed combinations (contribution - 52.7%), the number of completed elements and supporting jumps, as a factor of special technical preparedness - STT (16.3 %), temporary indicators (9.4%), SPhT (9.2%), trampoline preparation (4.1%).

Table 1. Matrix of factor weights of training load indicators competitive stage of training highly qualified gymnasts

№	Ndicators training loads	Factors				
		1	2	3	4	5
1	The number of training days	107	257	839	260	-089
2	Number of workouts	326	128	877	283	066
3	Net training time	239	150	845	201	189
4	The total number of items	372	568	381	596	125
5	**Total number of combinations**	916	330	158	074	078
6	Total number of approaches	206	748	329	406	167
7	The number of elements of the highest difficulty group	310	637	020	294	233
8	The number of elements of SPhT	057	028	324	892	198
9	Number of SPhT approaches	046	-033	211	925	-025
10	Intensity by element	248	609	374	497	-155
11	Intensity by combinations	846	397	139	076	-095
12	Number of stable combinations	893	328	175	121	-038
13	The number of elements of technical training	450	778	292	200	-007
14	Number of technical training approaches	215	862	262	-072	149
15	The number of elements in the exercises on the trampoline	080	122	033	-113	967
16	The number of approaches in exercises on the trampoline	060	183	075	016	961
17	The number of combinations in the floor exercise	619	653	016	-120	069
18	The number of combinations in exercises on Pommel Horse	843	100	190	260	254
19	The number of combinations in exercises on the rings	829	323	035	-113	093
20	Number of vault	202	667	-019	-169	110
21	The number of combinations in the exercises on the Parallel Bars	916	116	219	110	045
22	The number of combinations in the exercises on the Horizontal Bar	928	139	171	088	032

Note: «0» and comma before correlation coefficients omitted

The contribution of the first factor is most significant (52.7%). This included a group of indicators of training loads related to combinations only. The obtained indicators in the first factor with high coefficients of weight are the main pa of the competitive stage of preparation. This is important for

planning and controlling training loads at this stage of preparation. At competitions in sports gymnastics, a team of judges in the complex evaluate only the combinations. So, athletes realize the accumulated potential, performing combinations in individual types and gaining a certain amount of points in the all-around for each day of the competition. On the basis of complete combinations, certain features of the upcoming competitive activity are modeled, thus, training and competition modes come closer.

Of all the indicators of training loads included in the first factor, to control the athlete's readiness for competitions, the indicator of the number of stably executed combinations, which is determined as a percentage of the total number of combinations performed, is the most informative, as in each individual form and all-around. All of the above indicators of combinations are associated with the highest values of the weight coefficient with this factor. In this connection, the first factor is interpreted by us as a factor of the "number of completed combinations".

Let us dwell on the second factor. Its contribution to the total variance is 16.3%. The highest weight ratio of the connecting group of indicators of training loads corresponds to the number of completed elements of technical training, and most importantly, of the elements of the highest difficulty group. This factor characterizes the systematic use of specially-preparatory and general preparatory exercises for selectively improving the elements of competitive actions, increasing the overall level of the functional capabilities of the organization, developing the specific and maintaining overall performance at a sufficiently high level.

Proceeding from the purpose of the indicators of training exercises included in the second factor, we called it the factor "the number of completed elements and supporting jumps."

The third factor is determined by the closely related indicators of the number of training days, workouts, and net training time. Therefore, we believe that the factor of indicators, characterizing the temporal characteristics at the competitive stage, can be called the factor of "temporary indicators".

The fourth factor is the factor of special physical fitness of "SPhT" (special physical training), since the indicators of the number of completed exercises and approaches of SPhT are very high.

The fifth factor, which accounts for 4.7% of the total variance of the sample, reveals substantial weights in terms of the number of elements and the approaches taken on the trampoline. All this gives reason to interpret it as a factor of "trampoline preparation".

Conclusions. Thus, the factor analysis allowed determining the structure and identifying the most significant groups of training load indicators recommended for use in the formation of micro- and competitive mesocycle for highly qualified gymnasts, these are:

- quantitative and qualitative indicators characterizing the work on combinations, both general and for individual types of gymnastic all-around, with a very high level of correlation relationships (from r = 0.829 to r = 0.928).

- five factors with a different contribution of each of them to the total variance: factors of the number of executed combinations, the number of elements performed and support jumps, time indicators, special physical fitness, trampoline training.

For a more complete realization of the sporting and technical potential of highly qualified gymnasts at the main competitions of the four-year period, it is necessary to continuously monitor the stable performance of combinations on certain types and gymnastics multi-round, elements of the highest difficulty group (technical), the level of special physical and trampoline preparedness.

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