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The role of special physical training in improving the effectiveness of competitive exercises (handball)

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Abstract

Purpose: Increasing the effectiveness of the preparation of players of extreme amputee during training and competitions by developing combinational game techniques aimed at the development of technical and tactical actions of handball players.

Methods: The study uses methods of analysis of scientific and methodological literature, questionnaires; pedagogical observations; biomedical methods, control tests characterizing special preparedness, pedagogical experiment, mathematical and statistical data processing.

Results: Automated components aimed at the implementation of fast attacking actions by corner players during the preparation of qualified handball players for competitive activity, the analysis of competitive situations and the module of process control are applied in the classes of qualified handball players. At the comparative analysis of the results of corner players of the team 'SKUF' during the preparation of qualified handball players for competitive activity the efficiency of attacking actions at the beginning of the experiments was - 50%, after the experiments - 58%, growth rate - 8%.

Conlcusion: The relative share in the total power consumption of anaerobic and aerobic processes in maximum physical loads with different durations to increase the volume and intensity of the means of the preparatory stage of the players of the corner role was increased. At the same time, the level of physical fitness affecting the competitive activity of qualified handball players was 44 kg at the beginning of the experiments and 48 kg after the experiments when determining the hand strength of the right hand at the beginning of the experiments. The strength of the hand of the left hand was at the beginning of the experiments - 39 kg, and after the experiments - 45 kg. The number of flexion of the arms in the supine position at the beginning of the experiments was - 24 times, and after the experiments - 29 times.

In order to increase the tactical combination of qualified handball players, taking into account the game role of handball players involvement in the second half of the goalkeeper as the seventh player (for a temporary quantitative advantage on the court) The goal was introduced into the competition process, which helped to improve the accuracy of shots on goal.

Keywords: technical fitness of players, handball, tactical actions, level of game, combination of qualified handball players.

Introduction

In many countries of the world, the issues of education of a healthy generation, the development of physical culture and sports, as well as improving the health of the population is becoming one of the priorities. The role of handball, as one of the sports games, is increasing in improving people's health. In the studies of specialists in the field of handball states that the issues of improving the technical and tactical actions of highly qualified athletes by increasing the mass popularity of this sport are relevant. Of particular importance is to improve the planning of the training process, taking into account the improvement of tactical skills, accuracy of shots on goal for corner players in the sovcompetitive stage, as well as factors affecting the results of the game in the organisation of the training process.

In the world handball, the constant growth of competitive results, high competitiveness among the international sports grounds require an uninterrupted search for ways to effectively resolve the existing problems in the technical and tactical actions of athletes in the system of multi-year training. It is known that at present, one of the most important issues facing the sports games is: firstly, the technical and tactical training of athletes, and secondly, the positive impact and improvement of the results of players by the development of their physical qualities.

Leading scientists in the field of handball have carried out numerous scientific studies on improving the level of physical and technical fitness of players. The results of their research and the increase of competitiveness in the field of handball put forward the need to develop the optimal types of tools and techniques to be used in the assessment and analysis of technical and tactical actions of corner players directly. It is the issues of increasing the effectiveness of the collective game by assessing and analysing the technical and tactical actions of corner players in the competitive stage are one of the main factors in improving the sportsmanship of players. In the existing scientific and scientific-methodical sources there are not enough research materials on the issues of improving the quality of strength and technical-tactical actions of corner players, improving their physical fit-

ness, as well as increasing the level of game efficiency.

Methods

Analysis and generalisation of scientific and methodological literature, pedagogical observation, interviews, pedagogical control, pedagogical experiment and methods of mathematical statistics were used in the research work.

Results and discussion

The qualitative assessment of competitive activity is foreseen, defining effectively and ineffectively performed techniques during the game. For this purpose, the boundary of the difference between positive and negative motor actions is defined. In the composition of positive actions are included: selection of the ball, the correct transfer of the ball, effective throws of the ball, the transfer of the ball culminating in the capture of the goal and creating conditions for 7-metre bar throws, removal of the opponent for a 2-minute penalty time, exit to the opponent throwing the ball and 'tying' it, various situational obstacles (from above, from the side, from below) throwing the ball to the opponent. The composition of negative actions includes: a mistake when taking the ball, removal for a 2-minute penalty time, allowing an opportunity for 7-metre free throws, etc.

To qualitatively assess the effectiveness of handball players' technical and tactical actions, the mathematical model proposed by V.M. Goncharenko was used. The evaluation standards taking into account the qualifications and tasks of handball players were used for a comprehensive assessment of fair play.To fulfil the purpose and objectives of the study, we studied the technical and tactical actions of the corner players of the team "SKUF" in the third round of the national championship of Uzbekistan 2021, as well as monitored their effectiveness. In order to compare the level of technical and tactical preparedness of the corner players of 'SKUF' team, the technical and tactical actions of the corner players of 'AGMK' team of Almalyk city, 'Andijon OZK' team of Andijan city and 'URDU' team of Khorezm city were analysed. Questionnaires consisting of 10 questions were prepared to conduct a survey among 25 people coaches and athletes, the results of which are shown in Table-1.

Table 1. Results of testing different attacking actions of handball players of the national team "SKUF" of the control (n=24) and experimental (n=24) groups at the beginning of the pedagogical experiments

Test	Control group			Experimental group			AP	OP	t	P
	$\overline{X}$	σ	V, %	$\overline{X}$	σ	V, %				
Passing the ball[1]	198,34	24,94	12,57	195,04	25,29	12,97	3,30	1,66	0,46	>0,6
Passing the ball[2]	118,42	13,71	11,58	116,91	14,01	11,98	1,51	1,28	0,38	>0,7
Total	316,76	37,63	11,88	311,95	38,89	12,47	4,81	1,52	0,44	>0,6
Throwing the ball into the goal[1]	28,44	3,01	10,58	29,03	3,18	10,95	0,59	2,07	0,66	>0,5
Throwing the ball into the goal[2]	25,37	2,94	11,59	25,82	3,09	11,97	0,45	1,77	0,52	>0,6
Total	53,81	5,68	10,56	54,85	6,02	10,98	1,04	1,93	0,62	>0,5
Outlining[1]	7,74	0,90	11,59	7,53	0,90	11,95	0,21	2,71	0,81	>0,4
Outlining[2]	5,68	0,71	12,57	5,56	0,72	12,99	0,12	2,11	0,58	>0,5
Total	13,42	1,59	11,85	13,09	1,64	12,53	0,33	2,46	0,71	>0,4

Note: *[1]1-times, [2]2-times, AR-absolute difference, OR-relative difference, (%).*

The first stage (2020), is devoted to the theoretical analysis of literary sources, the formation of the research topic, the definition of the purpose and objectives of the study, the problems to be solved, the stages and timing of the pedagogical experiment, as well as the definition of means and methods used in the study.

The second stage (2021), is devoted to the study of the structural features and content of the educational and training process of handball players of the national team "SKUF" of the Uzbek State University of Physical Culture and Sport, the definition of the control and experi-

Table 2. Results of testing of attacking actions in the section of 10 minutes of handball players of the national team "SKUF" of the control (n=24) and experimental (n=24) groups at the beginning of pedagogical experiments

Test	Control group			Experimental group			AP	OP	t	P
	$\overline{X}$	σ	V, %	$\overline{X}$	σ	V, %				
1-10 minutes	12,48	1,57	12,58	12,16	1,57	12,94	0,32	2,56	0,71	>0,4
11-20 minutes	10,35	1,51	14,59	10,15	1,52	14,95	0,20	1,93	0,46	>0,6
21-30 minutes	13,62	1,85	13,58	13,92	1,94	13,97	0,30	2,20	0,55	>0,5
Total (1-30)	36,45	4,87	13,36	36,23	4,96	13,69	0,22	0,60	0,16	>0,8
31-40 minutes	9,43	1,19	12,59	9,73	1,26	12,97	0,30	3,18	0,85	>0,3
41-50 minutes	11,35	1,54	13,57	11,08	1,55	13,99	0,27	2,38	0,61	>0,5
51-60 minutes	8,74	1,27	14,58	9,05	1,36	14,97	0,31	3,55	0,82	>0,4
Total (31-60)	29,52	3,94	13,35	29,86	4,12	13,80	0,34	1,15	0,29	>0,7
General	65,97	8,92	13,52	66,09	9,07	13,72	0,12	0,18	0,05	>0,8

mental group for the research, explaining to them the content of the means and methods used in the research process, the curriculum of athletes to conduct experiments, pedagogical observation of practical training of handball players. All matches of the team "SKUF" were also analysed.

The third stage (2022-2023), is devoted to conducting pedagogical experiments with the participation of second and third year students engaged in handball in the team 'SKUF' of the Uzbek State University of Physical Culture and Sport. During the pedagogical experiments for the control and experimental group the programme developed by us was introduced step by step. In the control and experimental groups were involved 14 students, a total of 28 people involved in handball in the team 'SKUF'.

In the intervals between halves (in 10-minute section) we determined the number of attacks of KG and EG players. In total for the game (for 1-30 minutes), the number of attacks in KG was -36.45, in TG - -36.23, relative difference - 0.60% (t =0.66; P>0.3). Attack is the main decisive factor of the game, i.e. achieving success, in most cases, depends on its final result. During the half of the match, the total number of attacks made (for 31-60 minutes) was -29.52 in KG and 29.86 in EG, the relative difference was 1.15% (t =0.29; P>0.7). Technique, serves as a means of realisation of tactical plans of the player. Only at a high level of technical readiness it is possible to perform a variety of tactical actions.

We have developed and implemented in practice a programme of 6 weekly training of handball players. It gives exercises of general and special training for a week for the members of the national team 'SKUF' in handball, according to which the handball players of the experimental group were engaged in 3 days a week. Classes of the control group were conducted according to the standard programme.

The intensity of the exercise performed is considered to be the most important characteristic of the load, influencing the peculiarities of the ratio of aerobic and anaerobic process of energy supply, in which it is customary to distinguish 4 zones of intensity: maximum, submaximal, large and small. The duration of an exercise has an opposite dependence on its intensity. Its intensity sharply decreases if the duration of work increases from 20-25 seconds to 4-5 minutes. The type of energy supply of an exercise depends on its duration. The duration of anaerobic-alactate mode exercises is 3-8 seconds, and anaerobic-glycolytic mode - 20 20 seconds to 3 minutes, and in aerobic mode - 3 and more minutes. Based on the results of numerous studies, the proportions of anaerobic and aerobic processes in physical exercise in relation to total energy metabolism can be determined.

The data on the number of repetitions of an exercise, determines the level of its influence on the athletes' organism. Increasing the number of repetitions when working in aerobic conditions forces to maintain for a long time the work of respiratory and circulatory organs at a high level.

The number of repetitions of exercises in anaerobic mode leads to the completion of work in the oxygen-free mechanism or the environment of the central nervous system

Table-3. Relative proportion of total anaerobic and aerobic power expenditure during maximal exercise of different durations

Limits on the duration of operation	Power output			Relative share	
	Anaerobic processes	Aerobic processes, %	Total	Anaerobic processes, %	Aerobic processes, %
10 c	20	4	24	83	17
1 min	30	20	50	60	40
2 min	30	45	75	40	60
5 min	30	12	150	20	80
10 min	25	245	270	9	91
30 min	20	675	695	3	97
60 min	15	1200	1215	1	99

The length of time between rests, as well as the body's response to the training load, is of great importance in determining its characteristics. Here, the recovery processes occurring between rests consist of the following:

- the speed of recovery processes is not equal - recovery is rapid at the beginning and then decreases;
- different indicators recover at different times (heterochrony);
- phase changes in work capacity and other indicators during the recovery process.

In low-intensity exercise, sufficient for recovery in rest intervals, each subsequent repetition starts roughly similar to the previous one.

When rest intervals are reduced in this case, the load becomes more of an aerobic mode, because the respiratory processes that are evident at 3-4 minutes are also maintained.

Reducing the rest intervals in the intervals of maximum and submaximal power exercises turns the load into anaerobic mode, because the more the exercise repetitions, the more the oxygen debt increases.

Features of rest between exercises can be active, passive and mixed.

Conclusion

In improving the physical fitness of the players of the team 'SKUF' of the Uzbek State University of Physical Culture and Sport to improve the loads of different directions, the influence of developmental exercises on the work capacity of players was studied. As a result, the work capacity of handball players during the exercises increased by - 14.5%.

The results of handball players of the national team "SKUF" during 51-60 minutes of the game were at the beginning of the experiments - =9.05, σ = 1.36, V = 12.14%, at the end of the experiments - =10.72, σ = 1.52, V = 14.18%, absolute growth -1.67, relative growth - 18.45, (t =4.02, P<0.001.

The total results of 31-60 minutes of play were at the beginning of the experiments - =29.86, σ = 4.12, V =13.80 at the end of the experiments - =34.70, neither σ = 4.57, V =13.17%, absolute growth - 4.84, relative growth - 16.21, (t =3.85, P<0.001.

The total results of 1-60 minutes of play were - = 66.09, σ = 9.07, V = 13.72% at the beginning of the experiments, and - = 76.81, σ = 10.06, V =13.10%, absolute growth - 10.72, relative growth - 16.22 (t = 3.88, P<0.01) at the end of the experiments.

The analysis of special physical fitness of 'SKUF' team players in the context of weekly loads showed that in the test 'Throwing the ball into the goal from the right and left corners with overcoming passive and active defender' at the beginning of the week 230 throws were made, then at the end of the week 280 throws were made. In the test 'Throwing the ball into the goal from the right and left corners with a step forward' at the beginning of the week 210 throws were made, at the end of the week 260 throws were made. In the test 'Throwing the ball into the goal from the right and left corners for time' at the beginning of the week 200 throws were made, at the end of the week 250 throws were made. At the same time, if the exercises of the programme are planned on average 13-17% higher than the normative ones, it will lead to achieving high results in competitive activity.

The traditional standard exercises and specially selected auxiliary games applied by us in the competitive activity of handball players effectively influence the increase of technical and tactical actions and physical qualities of corner players, which determines the necessity of their implementation in the training process of handball players.

With the right choice of the direction of classes with the help of standard exercises and training games can be achieved improvement of technical and tactical actions of handball play-

ers, as evidenced by the results of corner players of the team 'SKUF' Uzbek State University of Physical Culture and Sports during the Championship of Uzbekistan.

4. It is recommended to use in the course of preparation for competitions the weekly training programme developed by us, aimed at improving the technical and tactical actions of corner players.

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