

Comprehensive training of highly qualified athletes in beach volleyball

UDC 796

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Received by the editorial office on 20.03.2024

Abstract

Objective of the study was to identify the features of complex training of highly qualified athletes in beach volleyball.

Methods and structure of the study. The scientific work was carried out from November 2022 to March 2023 with the participation of 24 beach volleyball players (control group - 12 people, experimental group - 12 people). For participants in the control group, the process of sports training was carried out traditionally, and for participants in the experimental group - using elements of the scientific and technological concept of complex training of athletes-players, promoting an increase in the power and intensity of the training process of beach volleyball players, an increase by 10% in the partial contribution of training exercises from the means of the fourth and the fifth training zones (heart rate during execution - 172 beats/min and above) in the total volume of training means.

Results and conclusions. The results of determining the level of physical fitness of athletes and the quality of their competitive activity are presented, the average group values of which can be used as a model for those players who want to gain a foothold in leading positions in domestic and foreign beach volleyball of the highest achievements.

Keywords: beach volleyball, highly qualified athletes, comprehensive training.

Introduction. One of the ways to increase the level of sportsmanship of highly qualified players in modern beach volleyball is the use of complex training means for athletes, the scientific and technological concept of which was developed by a group of teachers from the Kuban State University of Physical Culture, Sports and Tourism under the guidance of a candidate of pedagogical sciences, associate professor, dean of the faculty advanced training and retraining of personnel Kostyukova O.N. and is successfully used in sports games - basketball, volleyball, handball, table tennis [1, 2].

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Methods and structure of the study. The study was conducted from November 2022 to March 2023 with the participation of 24 beach volleyball players (control group - 12 people, experimental group - 12 people), whose teams then entered the play-off stage of the finals of the Russian Beach Volleyball Championship 2023, where they became winners and winners, as well as participants in the 1/8 and 1/4 finals. 16 of the 24 athletes

surveyed were members of the Russian national beach volleyball teams.

For participants in the control group, the process of sports training was carried out traditionally, for participants in the experimental group - using elements of the scientific and technological concept of complex training of athletes-players, promoting an increase in the power and intensity of the training process of beach volleyball players, an increase by 10% in the partial contribution of training exercises from the means of the fourth and fifth training zones (heart rate during execution – 172 beats/min and above) in the total volume of training means.

The complexity of the process of sports training of the surveyed beach volleyball players consisted in the use of training means of related sports (physical, technical and tactical training), as well as the use of modern technologies for transmitting information, activating and accelerating the processes of formation of the necessary motor skills and professional gaming competencies (theoretical, psychological, integral preparation) among athletes.

The partial contribution of complex training means was 10% of the total time spent on the process of sports training of the surveyed beach volleyball players.



The traditional training program for highly qualified beach volleyball players basically complied with the requirements of the Model Sports Training Program for the sport «Volleyball», the sports disciplines «volleyball» and «beach volleyball», developed by a team of authors under the general editorship of Yu.D. Zheleznyak. V.V. Kostyukova, A.V. Chachina (2016) based on the requirements of the Federal Standard of the Ministry of Sports of Russia (2013), for representatives of beach volleyball of the highest achievements [3].

Innovations in the developed 4,5-month comprehensive training program with a volume of 300 hours concerned the following:

- a) the amount of time allocated for general physical training was reduced by 10,0 hours (3,3%);
- b) the amount of time allocated for technical training was reduced by 5,0 hours (1,7%);
- c) the amount of time allocated for psychological and theoretical training was reduced by 5,0 hours (1,7%);
- d) the amount of time allocated for special physical training was increased by 10,0 hours (3,3%);
- e) the volume of hours allocated for tactical training was increased by 5,0 hours (1,7%);
- f) the volume of hours allocated for integral training was increased by 10 hours (3,3%).

In general, the cumulative changes of 30 hours (10,0% of the total training volume) were aimed at increasing the partial contribution of intensive training activity to the total time of volleyball training, which increased the opportunity to pay more attention to the development of mixed aerobic-anaerobic mechanisms providing energy for the muscle activity of beach volleyball players high sports qualifications necessary to obtain good sports results in this sport.

In the developed 300-hour comprehensive training program, implemented over 4,5 months, the set of changes made should cause a more pronounced developmental response of the systems and functions of the body of highly qualified beach volleyball players assigned to the experimental group.

Results of the study and discussion. The process of sports training of the surveyed beach volleyball players of the experimental (EG) and control (CG) groups had a varied impact on the level of physical fitness of the players (see table), as well as on the efficiency and effectiveness of their competitive activities.

As the study showed, the results of running from a place of 20 m over 4,5 months of training improved in the control group by 0,06 s, and in the experimental group by 0,18 s, which is three times more. The reduc-

tion in the time for performing the shuttle run of 45,3 m (the «Envelope» test) in the control group was 0,16 s, and in the experimental group – 0,73 s, which is also several times more in favor of the experimental group. The results of throwing a medicine ball weighing 1 kg from behind the head with both hands while sitting also indicate that in the experimental group the improvements were more pronounced than in the control group - 11 cm and 73 cm, respectively. Changes in the results of jumping tests confirm the previously stated pattern of more the pronounced impact of the developed training program for complex training in beach volleyball compared to the traditional one. Thus, the improvement in the results of standing long jumps in the control group over 300 hours of training was 6 cm, and in the experimental group - 18 cm, in standing high jumps – 1,7 cm and 5,7 cm, respectively. Thus, according to its battery of five physical fitness tests, the improvement in the EG was two to three times greater than in the CG. Moreover, according to two out of five criteria (40%), the differences in the level of physical fitness in the experimental group exceed those in the control group statistically significantly ($t = 2,34-3,06$; $p < 0,05$), which indicates the feasibility of using a developed, 300-hour training program of comprehensive training in the practice of working with highly qualified beach volleyball players in the preparatory and competitive periods of the annual cycle of sports training.

The experiment proved that regular purposeful training in beach volleyball for four and a half months in the amount of 300 hours according to traditional (control group) and developed (experimental group) programs causes a positive developmental training effect in the examined athletes of high sports qualifications (see table). Their competitive activity becomes more effective and efficient: for example, the overall efficiency of serving increased by 0,8% in the control group and by 3,7% in the experimental group. At the same time, serve losses decreased from 9,0% to 6,2% among beach volleyball players who trained traditionally and from 9,1% to 5,3% among athletes who trained more intensively (EG). The above-described pattern can also be traced in the dynamics of other studied parameters of the quality of competitive actions of highly qualified beach volleyball players.

In general, if we evaluate the magnitude of improvements in the criteria for the effectiveness and efficiency of performing attacking and defensive game actions demonstrated in competitive conditions, then in the control group they will be one and a half to two and a half times less than in the experimental group.



Efficiency and effectiveness of competitive actions of highly qualified beach volleyball players from the control (CG - 12 people) and experimental (EG - 12 people), recorded during the pedagogical experiment – from November 26, 2022 (initial survey) to March 8, 2023 (final survey)

№ n/n	Groups, surveys, results Indicators	Control group		Experimental group		t _{3,4}	t _{5,6}	t _{3,5}	t _{4,6}	t _{3,6}
		Initial survey (m±m)	Final survey (m±m)	Initial survey (m±m)	Final survey (m±m)					
Feed efficiency %										
1	Winning	6,8±0,76	7,3±0,81	6,9±0,92	7,9±1,08	0,45	0,70	0,08	0,44	0,83
2	Loss of feed	9,0±1,14	6,2±0,96	9,1±1,16	5,3±0,87	1,88	2,62	0,06	0,69	2,58
3	General	15,8±2,45	16,6±2,12	15,6±2,41	19,3±2,37	0,25	1,09	0,06	0,85	1,03
Efficiency of receiving the ball from serve %										
4	Positive reception	66,3±4,86	69,8±4,33	67,8±5,61	81,3±5,79	0,54	1,67	0,20	1,59	1,98
5	General	59,0±6,28	63,3±6,12	60,5±6,39	70,6±6,91	0,49	1,07	0,17	0,79	1,24
Efficiency of offensive strikes on the return %										
6	Winning	59,9±4,55	61,7±5,06	59,7±4,39	67,4±4,77	0,26	1,19	0,03	0,82	1,14
7	General	62,5±4,04	64,3±3,29	63,3±3,87	71,4±3,93	0,35	1,47	0,14	1,39	1,58
Blocking efficiency (n)										
8	Blocks per game (average)	3,3±0,26	3,6±0,31	3,4±0,40	4,1±0,53	0,74	1,05	0,21	0,81	1,36
9	Blocks per tournament	9,3±0,68	10,7±0,71	9,5±0,73	12,2±0,81	1,42	2,48	0,20	1,39	2,74
Defensive Performance (n)										
10	Balls per game (average)	4,2±0,40	4,7±0,43	4,1±0,39	5,8±0,52	0,85	2,62	0,18	1,63	2,44
11	Balls per tournament	21,4±1,69	23,7±1,80	22,1±1,62	27,8±1,87	0,93	1,58	0,30	2,30	2,54
Efficiency of counterattacks (replays) %										
12	Winning	36,5±10,55	37,7±9,36	36,9±7,88	45,3±8,66	0,09	0,72	0,03	0,60	0,64
13	General	68,8±5,11	70,3±5,26	69,1±5,34	79,0±5,99	0,20	1,23	0,04	1,09	1,30

Note: the values of indicators in shaded cells characterize statistically significant differences.

Among the 13 considered indicators of the quality of competitive actions of highly qualified beach volleyball players, four (30,8% of the entire digital array) improved statistically significantly in favor of representatives of the experimental group. These include criteria such as service losses (2,58-2,62, $p < 0,05$), blocking efficiency per tournament (2,48-2,74, $p < 0,05$) and defensive play per tournament (2,30-3,12, $p < 0,05$).

It is advisable to use these indicators for pedagogical control of the quality of training sessions in the preparatory and competitive periods of the annual process of sports training of highly qualified beach volleyball players.

Conclusions. The results of the pedagogical experiment made it possible to:

a) justify and experimentally determine the effectiveness of the developed program of comprehensive training for highly qualified beach volleyball players of 300 hours, implemented over four and a half months (from November 26, 2022 to March 8, 2023) and including a 30-hour block of innovations and corrections that increases intensity and effectiveness of training sessions;

b) identify the initial level and nature of the dynamics of the parameters of the physical status of athletes from the control and experimental groups who participated in the pedagogical experiment;

c) determine the nature of changes in the quality of attacking and defensive competitive actions of highly qualified beach volleyball players of the experimental and control groups in the preparatory and competitive periods of year-long training;

d) recommend the studied criteria of preparedness of the surveyed beach volleyball players, according to which statistically significant improvements were found during the pedagogical experiment, for use in monitoring the quality of the process of their sports training.

e) confirm the feasibility of applying the scientific and technological concept of complex training of player athletes in elite beach volleyball.

References

1. Kostyukov V.V., Bulykina L.V., Guba V.P., Rodin A.V. Voleybol i yego raznovidnosti. Textbook for universities of physical education. 2023. 523 p.
2. Kostyukova O.N., Kostyukov V.V., Tyutyunnikov A.S., Prokopenko Yu.E., Tyutyunnikova N.V. Organizatsiya kompleksnoy podgotovki yunyh voleybolistov v selskoy mestnosti. Fizicheskaya kultura, sport – nauka i praktika. 2023. No. 4. pp. 57-62.
3. Primernaya programma sportivnoy podgotovki po vidu sporta «Voleybol» (sportivnyye distsipliny «Voleybol» i «Plyazhnyy voleybol»). Yu.D. Zheleznyak, V.V. Kostyukov, A.V. Chachin [ed.]. Moscow. 2016. 224 p.