



The results of a pedagogical experiment aimed at improving overall endurance in football during the training period

UDC 796.386



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Received by the editorial office on 12.04.2025

Abstract

Objective of the study is to improve the methodology for developing the general endurance of football players using high-intensity interval training.

Methods and structure of the study. The experimental study was carried out on the basis of the State Budgetary Institution of Additional Education "Sports School of Olympic Reserve No. 19 named after B. Kabargin" in the conditions of the training process. Direct participants of the pedagogical experiment were 20 young football players aged 13-14 years at the training stage of preparation in the sports school, 10 of whom were included in the experimental group and 10 players in the control group. Complexes of high-intensity interval training were developed, aimed at increasing the aerobic performance of the athletes' body and in their content represented high-intensity exercises that alternated with various variations of rest.

Results and conclusions. It was established that the use of the proposed sets of exercises in the training sessions of football players led to positive changes in a number of endurance indicators in the experimental group. The positive dynamics of the parameters of general endurance was especially clearly observed in specific tests for football players of this age period.

Keywords: *football, physical training, endurance development, high-intensity interval training.*

Introduction. In modern world football, which is characterized by a high density and intensity of play with a large number of single combats, the success of competitive activity is determined by the high level of comprehensive training of athletes. During the match, a football player performs a variety of technical and tactical actions, the quality of which depends on the level of special performance. Often in the game, goals are scored in the last minutes of the match or in extra time, which indicates a loss of concentration and the onset of premature fatigue. In these circumstances, one of the important qualities in football should include general endurance, which is the foundation for the successful implementation of technical actions of players.

However, it should be noted that in sports schools, for the development and improvement of aerobic endurance, coaches mainly use methods of continuous exposure in moderate-intensity exercises, which does

not fully reveal and optimize the adaptive mechanisms of the body.

In these circumstances, the search for new variable ways to improve the effectiveness of the methodology for developing general endurance in football is an urgent problem. The gaps that have arisen at present can be resolved only with a qualitative transformation of the structure and content of the training process and its intensification. The most promising direction, in our opinion, in this aspect is the technology of constructing the training process for football players using high-intensity interval training, which is characterized by short repetitive series of intensive tasks alternating with recovery periods of low intensity or passive rest, contributing to the diversity and variability of the load.

Objective of the study is to improve the methodology for developing the general endurance of football players using high-intensity interval training.



Methods and structure of the study. The experimental study was carried out from September 2023 to May 2024 at the State Budgetary Institution of Additional Education of the Rostov Region “Olympic Reserve Sports School No. 19 named after B. Kabargin”.

The experiment was aimed at testing the effectiveness of the developed high-intensity exercise complexes aimed at improving the overall endurance of 13-14 year old football players. In order to determine the content of training sessions for the football players participating in the study, pedagogical observations were conducted. A total of 8 training sessions were analyzed in groups of young athletes at the State Budgetary Institution of Additional Education “Olympic Reserve Sports School No. 19 named after B. Kabargin”.

During the observation, it was established that to solve the problems of physical training, the sports school coaches use traditional means with an emphasis on technical and tactical training, which is allocated about 70% of the total training time. Basically, this is the improvement of technical elements in football using specially preparatory and selected competitive exercises (passes, “squares”, shots on goal, game combinations, etc.). The rest of the time (20%) was allocated to other types of training.

It was revealed that the content of general physical training includes strength exercises using the repeated method (push-ups, squats, bending and unbending the body, etc.). In the training process as part of special physical training, tasks on the coordination ladder, jerks, accelerations, shuttle running are used.

As a result of observations, it was also established that only long-term running exercises of moderate intensity at the beginning of training along the perimeter of the field (10-15 minutes) are used to develop general (aerobic) endurance.

In addition, the results of testing the level of general endurance according to the main parameters in groups of young football players aged 13-14 years showed a low level of its development (Table 1).

Based on the analysis of scientific and methodological literature, state educational programs and the standard for the sport of “Football”, we have developed complexes of high-intensity interval training aimed at improving the overall endurance of young football players. When compiling microcycles, the preparation period, age and anatomical and physiological characteristics of those involved were taken into account.

Experimental training was aimed at increasing the aerobic performance of the athletes’ body and, in terms of its content, represented high-intensity exercises that alternated with various variations of rest. The increased intensity of the tasks ensured the work of physiological systems to work above the threshold values of a submaximal and maximum nature.

In addition, the presented complexes provided for the modeling of game situations of football players, in which there are alternating short-term stresses. The tasks were planned with an increase in the volume of impacts at a higher intensity due to the partial restoration of metabolic mechanisms in adjustable intervals of passive or active rest. The developed high-intensity interval training complexes used exercises with and without a ball, as well as strength-oriented tasks with the global participation of all muscle groups. The exercises were included in the preparatory and main parts of the classes, depending on the focus.

To test the effectiveness of the developed tools, a pedagogical experiment was carried out over a six-month period, during which the control group (n=10) studied according to the generally accepted training program approved in the sports school, and the content of the training sessions of the experimental group (n=10) included specially developed complexes of high-intensity interval exercises aimed at improving the overall endurance of 13-14 year old football players.

Specially selected physical training tools in the training sessions in the experimental group were used in the main part of the classes. As a result of the final

Table 1. Level of development of general endurance of football players aged 13-14 in specific and non-specific tests

Tests	Unit of measurement	Average result in the group (n=20)	State of the art
Cooper test	М	2155,3	short
Harvard Step Test	ИГСТ	58,8	short
«Bansgbo»	М	2263,4	average
«Yo-yo»	М	1778,9	short
«Hoff»	М	1567,2	short



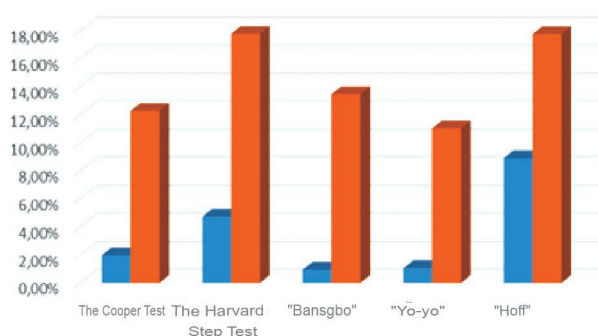
Table 2. Indicators of the level of development of general endurance in groups of football players aged 13-14 years during the pedagogical experiment

Тест	КГ до эксп. (n=10)	КГ после эксп. (n=10)	КГ прирост показателей (%)	ЭГ до эксп. (n=10)	ЭГ после эксп. (n=10)	ЭГ прирост показателей (%)
Неспецифические тесты						
Тест Купера (м)	2055,7	2096,6	1,98%	2106,7	2365,2	12,27%
Гарвардский степ-тест	57,1	59,8	4,72%	60,8	71,6	17,76%
Специфические тесты						
«Бансгбо» (м)	2121,2	2141,5	0,95%	2214,4	2512,5	13,46%
«Йо-йо» (м)	1738,3	1756,6	1,05%	1698,3	1885,5	11,02%
«Хофф» (м)	1507,1	1641,3	8,9%	1567,5	1845,6	17,74%

testing at the end of the pedagogical experiment, data were obtained that were processed using mathematical and statistical methods.

Results and conclusions. It was found that the use of the proposed exercise complexes in the training sessions of football players led to positive changes in a number of endurance indicators in the experimental group. The positive dynamics of the parameters of general endurance was especially clearly observed in specific tests for football players of this age period (Table 2).

As a result of the final testing, the advantage of young football players from the experimental group over their classmates from the control group was seen in all indicators of overall endurance, which confirmed the hypothesis of the study (see figure).



Increase in indicators (%) of general endurance in football players aged 13-14 years at the end of the experiment

Conclusions. In the presented study, based on the data obtained at the end of the experiment, the effectiveness of the developed means in the process of physical training of young football players was proven. It was found that the use of high-intensity exercises and special game tasks in the training process had a positive effect on endurance indicators. The results of the final testing showed a significant increase in the level of endurance development in 13-14 year old players of the experimental group, both in specific and non-specific tests.

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