

## THE STRUCTURE OF PHYSICAL FITNESS AND ITS CORRELATION ANALYSIS AT YOUNG PLAYERS AGED 16-17 YEARS AT THE STAGE OF BASIC TRAINING

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**Annotation.** *Purpose:* The questions about the importance of physical fitness of young players to improve the management and correction of the training process. *Material:* In the research participated 40 players aged 16-17 years of specialized youth football school of FC "Obolon-Brewery". Data for the study of physical fitness were teacher observations and teacher testing carried out under the direct training of young players. *Results:* It is shown that the structure of physical fitness among all the studied parameters there is a close correlation relationship, except for a parameter that characterizes the start speed. It was found that the above regularities indicate the advisability of excluding the studied parameters in the structure of physical fitness of young players to improve the efficiency of the training process at the base of specialized training. *Conclusions:* It is recommended to improve the starting speed to use non-gaming and technical and tactical exercises.

**Keywords:** young players, structure, physical fitness, control tests, correlation analysis.

### Introduction

Modern football implies high level of players' fitness. Modern style of play means maximal possible speed, high reliability of technical-tactic actions with minimal mistakes.

Football player's physical fitness [2, 6, 14] is characterized by complex of quickness, speed-power qualities, endurance (general and special), relative strength, coordination.

In this connection, with sufficient stability of football players' technical sportsmanship, effectiveness of training's management is, to large extent, determined by coach's ability to monitor players' condition, to reach maximal individual indicators of physical and functional fitness of players of different roles and of team in the whole; to maintain this level during all competition period.

M.A. Godik [2] writes that in the process of many-years' training main forms of motion skills acquire specialized character.

Football is characterized by alternative competition conditions, high level of specific endurance. Distinctive feature of sport games, football in particular, is presence of great number of complex motion functions, which require high level of abilities to explosive forces, variable adaptation to changing conditions of competition struggle. Besides, football requires ability to resist tiredness without weakening of effectiveness of players' technical-tactic actions [3, 6, 7, 11].

That is why it is important, in this aspect, to understand the structure, i.e. combination of connections between components, type and form of inner organization of junior football players' physical fitness.

Some works [1, 8, 12, 13] regarded structure and dynamic of development of football players' motion qualities at different stages of sportsmanship's perfection.

Our researches showed that leading factor, which reflects level of junior football players' physical fitness, is aerobic component of endurance. The second by importance factors is anaerobic glycolitic component of endurance, the third – technical level's resistance to embarrassing factors [10, 15]. As per data of A.P. Zolotariov [4] sportsmanship of 14-17 years old football players to large extent depends on such factors as body mass and length, physical workability, speed-power qualities, quickness.

Besides, correlation analysis of indicators of physical fitness's different sides permits to determine the most informative indicator and it shall be considered with composing of programs for physical fitness's control. With it, age and specialization in game shall also be considered [13].

Thus, analysis of researches and publications shows that this problem has been being studied rather profoundly, however there is deficit of works, devoted to structure of junior, 16-17 years old, football players' physical fitness on the base of correlation analysis.

The work has been fulfilled in the frames of combined plan of scientific and research works in sphere of physical culture and sports for 2011-2015, of Ministry of education and science, youth and sports of Ukraine, by topic 2.3 "Scientific-methodic principles of perfection of sportsmen's training system in football, considering specificities of competition functioning", state registration number 0111U001722.

### Purpose, tasks of the work, material and methods

*The purpose of the research* is to study the structure of physical fitness and determine interconnection of 16-17 years old junior sportsmen's indicators at the stage of specialized basic training.

*The tasks of the research:*

- on the base of analysis of scientific-methodic literature to study up-to-date situation of problem of football players' physical fitness's structure;

- with the help of correlation analysis to determine interconnection of indicators of junior football players' physical fitness and its structural features.

*The methods of the research:* analytical analysis of scientific-methodic literature, pedagogic observations, pedagogic testing, methods of mathematical statistics.

For evaluation of physical qualities we applied measuring system «Optijamp Next» (Micro-gate SRL-Italy), consisting of timer Racetime 2 Kit Light Radio and photocells Politemo Ligt Radio.

*Organization of the research:* pedagogic testing of physical fitness was conducted at SCJSOR (Sport children-junior school of Olympic reserve) "Obolon", Kiev, in 2012-2013. In the research 20 junior football players of 16-17 years old age took part. All they were participants of Ukrainian championship for children- junior football league teams. The received results were processed with the help of correlation analysis.

#### Results of the research and their discussion

Analysis of data of teams' physical condition plays important role in junior football players' physical fitness and successfulness of their participations in competitions.

Correlation analysis of main sides of junior football players' physical fitness is given in table 1.

Table 1

*Correlation matrix of interconnections of indicators of junior football players' (16-17 years old age) physical fitness (n=40)*

No.	Indicators	1	2	3	4	5	6	7	8	9	10
1	Length of body, cm	1									
2	Mass of body, kg	<b>0.81</b>	1								
3	PWC <sub>170</sub> kgm/min, kg	<b>-0.36</b>	<b>-0.37</b>	1							
4	MCO, ml/min.kg	<b>-0.48</b>	<b>-0.53</b>	<b>0.98</b>	1						
5	15 meters' run from the spot, sec.	0.09	0.11	-0.06	-0.08	1					
6	15 meters' run from walking, sec.	0.13	0.16	-0.15	-0.17	<b>0.61</b>	1				
7	30 meters' run, sec.	0.03	0.02	-0.15	-0.14	<b>0.60</b>	<b>0.69</b>	1			
8	Shuttle run 7×50 m, sec.	<b>0.33</b>	0.29	<b>-0.31</b>	<b>-0.34</b>	<b>0.38</b>	<b>0.55</b>	<b>0.38</b>	1		
9	12-minutes' run, meters	-0.20	-0.17	<b>0.53</b>	<b>0.52</b>	-0.10	-0.28	-0.12	<b>-0.47</b>	1	
10	Vertical jumping, cm.	<b>0.40</b>	<b>0.37</b>	-0.13	-0.19	-0.14	<b>-0.35</b>	<b>-0.45</b>	0.02	-0.01	1

Notes: MCO – maximal consumption of oxygen; confident interconnections are marked in bold type (P<0.05).

As we see in table 1 analysis of correlation between physical fitness's indicators permits to determine that from 45 cases of correlation dependences there are 13 weak, 7 moderate and 2 with high dependence.

It should be noted that weak static correlation exists between anthropometric indicators (body length and mass) and tests, reflecting general physical workability (PWC<sub>170</sub>) and aerobic efficiency –  $r=-0.36$ ;  $r=-0.48$  and indicators of tests "Shuttle run 7×50 m" and "Vertical jumping" –  $r=0.33$ ;  $r=0.40$ . Indicators "Shuttle run 7×50 m" has weak interconnection with tests PWC<sub>170</sub>, MCO and quickness (15 meters' run from the spot and 30 meters' run) accordingly:  $r=-0.31$ ;  $r=-0.34$ ;  $r=0.38$ ;  $r=0.38$ . In test "12 minutes' run" also we can see weak correlation interconnection with indicators of "Shuttle run 7×50 m"  $r=-0.47$ . Indicator of "Vertical jumping" have weak correlation interconnections with physical condition's indicators, "15 meters' run from walking" and "30 meters' run" accordingly:  $r=0.40$ ;  $r=0.37$ ;  $r=-0.35$ ;  $r=-0.45$ .

Mean statistic correlation interconnection exists between the following indicators: MCO and body weight  $r=-0.53$ , quickness "15 meter' run from the spot" and "15 meters' run from walking" and "30 meters' run", accordingly:  $r=0.61$ ;  $r=0.69$ ; special endurance "Shuttle run 7×50 m" and "15 meters' run from walking" –  $r=0.55$ ; general endurance "12 minutes run" and PWC<sub>170</sub>, MCO –  $r=0.53$  и  $r=0.52$ .

Indicators of physical condition and general physical workability as well as aerobic efficiency have high level of connection in structure of physical fitness:  $r=0.81$  и  $r=0.98$ .

Thus, the conducted correlation analysis of junior 16-17 years old football players' physical fitness resulted in determination, mainly, of moderate and low levels of interconnection that implies sufficiently close interconnection of physical fitness's level nearly by all indicators except indicator, which characterizes start speed.

It permits to consider that distribution of motion qualities in structure of junior football players' physical fitness at this stage was even. It permits to purposefully increase level of start speed with the help of special and technical-tactic exercises.

**Conclusions:**

1. Studying of physical fitness's structure and its correlation analysis (of junior football players) at stage of specialized basic training showed presence of rather clear structural features, which greatly influence on football players' physical fitness.

2. Management of training process at present stage of football's development can not be effective without objective data about junior football players' physical fitness, which would permit to individualize and correct their readiness to training and competition functioning.

*The prospects of further researches* imply study of above mentioned indicators of junior football players, depending on their role in team.

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