PEDAGOGICAL METHODS FOR ASSESSING PHYSICAL PERFORMANCE AND FUNCTIONAL TRAINING PLAYERS AMATEUR TEAMS

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Annotation. *Purpose:* to determine the optimal level of physical performance and functional training of students - football players. *Material*: the study involved 19 students - football players. Players performed first running load. Distance of 700-900 m time to overcome a distance of about 5 min. After resting for 5 minutes. performing a second load. *Results*: the expediency of application of the running version of PWC 170 test to determine the level of physical performance of soccer players. Developed additional criteria for evaluating operational readiness players: speedy recovery index and the index of rapid adaptation to training loads. The indexes of physical fitness, functional training and rapid adaptation of players. *Conclusions*: pedagogical tests can quickly assess the physical capacity and the willingness of players to competitive activity.
Key words: *footballers, physical, capacity, functional, preparedness, pedagogical, methods.*

Introduction

For effective control of training process it is necessary to ensure control over orientation and intensity of training loads, trainees' fitness and workability. For this purpose not only laboratory testing is used but also testing in conditions of practical trainings [2, 3, 6, 8, 14, 18].

In practice of trainings' controlling in team kinds of sports application of laboratory (medical-biological and physiological) methods for determination of functional fitness is rather problematic [13, 15-17, 19, 20]. That is why these methods of control, as usual, are used at stage-by stage testing. Pedagogic methods of sportsmen's fitness determination are rather simple and serve as control criteria both in stage-by stage and in current examinations. They permit to determine different indicators of sportsmen's fitness in field conditions by coach and team's doctor [5, 8]. Considering the above said application of pedagogic methods for determination of physical workability and functional fitness of football players' organism to competition functioning is urgent and has significant practical importance.

Purpose, tasks of the work, material and methods

The purpose of the research is determination of physical workability and functional fitness of HEE students-football players with the help of pedagogic methods.

The tasks:

1. Determination of physical workability and functional fitness levels of sportsmen with the help of run variant of test PWC $_{170}$ (V).
2. Working out of criteria for determination of sportsmen's functional fitness in team outdoor games' kinds of sports.

Material and methods of the research: in our research 19 students – football players of combined team of KNEY participated. Their sport qualification was 1st – 2nd degrees in football. The researches were conducted from January to March 2014 in period of training of KNEU combined team for HEE championship in Kiev. For solution of our tasks we used the following *methods:* analysis of literature sources, pedagogic testing, pulse metering, mathematical statistic methods.

For determination of physical workability level and maximal oxygen consumption (MOC) we used run variant of test PWC $_{170}$ (V). This method is based on linear dependence of speed of running and heart beats rate (HBR [4, 10, 12, 15]. The basis of run variant of test PWC $_{170}$ (V) was track and field running as a physical load. [1]. The test does not require maximal sportsman's efforts and can be conducted in any conditions.

The methodic of testing: football players fulfilled first running load without warming up at distance of 700-900 meters. Speed of running was constant with HBR of 110–130 b.p.m/ Time of running the distance was 5 minutes. At the end of first running load HBR was registered. After rest, during 5 minutes, the second load was fulfilled at distance of 1100 – 1300 meters. Speed of running was also constant with HBR of 150–160 b.p.m. Time of running the distance was about 5 minutes. Also at the end of the second load HBR was registered.

Speed of running at first (V_1) and second (V_2) distances was calculated by formula:

$$V = \frac{S}{t},$$

where: S – length of distance; t – time of running the distance.

Physical workability PWC $_{170}$ (V) was determined by formula [1, 4]:

$$PWC_{170}(V) = V_1 + (V_2 - V_1)\frac{170 - f_1}{f_2 - f_1},$$

where: PWC $_{170}$ (V) – power of load in m.p.sec, with which HBR reaches 170 b.p.m.

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Value PWC $_{170}$ (V) calculated as PWC $_{170}$ in kgm/min. For this purpose we used formula of Z.B. Bilotserkovskiy:

$$PWC_{170} = 299 \cdot PWC_{170}(V) - 36$$

Maximal oxygen consumption (MOC) was calculated by formula [4]:

$$MOC = 1{,}7 \cdot PWC_{170} + 1240$$

Relative MOC indicators was calculated by formula [1, 4]:

$$MOC\ rel. = MOC/BM,$$

where: BM – body mass of sportsman.

Besides run variant of test PWC $_{170}$ (V) we worked out two criteria, which, in our opinion, characterize physical workability and functional fitness: index of operative restoration of HBR and index of operative adaptation.

Index of operative restoration (IOR) was calculated by formula:

$$IOR = 100 - (f_b \cdot 100)/f_p,$$

where:

f p – HBR just after testing exercise, fulfilled for 10 seconds;

f в – HBR at the end of first minute of restoration during 10 seconds (from 50 – to 60 seconds);

100 – indicator, reflecting value in percents.

For test exercise we chose shuttle run 180 meters (see fig.1)

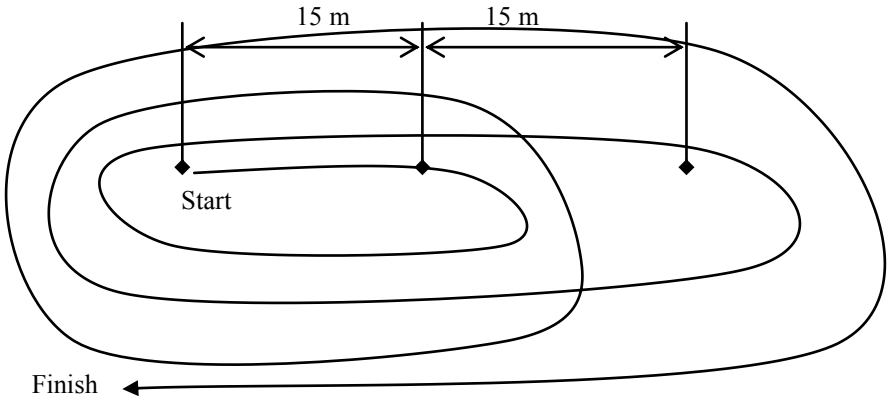

Fig.1. Diagram of test "shuttle run 180 meters.

By coach's signal sportsman starts run from first stand, covering distance of 15 meters, runs around the second stand returns to the first one, the he runs to the third stand, runs around it and returns to the first one. The exercise is to be repeated twice.

Index of operative adaptation is determined by formula:

$$IOA = [(f_p - f_p)/t] \cdot 100,$$

where: t – time of test's fulfillment (shuttle run 180 meters);

100 – constant factor.

Results of the research

Our purpose was determination of optimal criteria of physical fitness, which can be obtained in conditions of trainings (in camps) without applying of complex laboratory instrumental methodic. Practice of football players' trainings witnesses that preparation of a team for competitions takes several months and often is conducted in camps. In camps often conditions for laboratory testing with the help of ergo-meter, treadmill do not exist. The above provided criteria for evaluation of physical workability, functional fitness and adaptation to specific training loads condition more effective current control over sportsmen's fitness directly in process of trainings. Indicators of physical and functional fitness as well as operative adaptation of football players of KNEU combined team are given in table 1.

Table 1

Indicators of physical workability, functional fitness and operative adaptation to training loads of KNEU students – football players (n = 19)

Nos.	Criteria	Statistic indicators		
		$\overline{X}$	δ	$\overline{V}$, %
1.	PWC $_{170}$ (V), м/с	3.10	0.40	12.9
2.	PWC $_{170}$, kgm/min.kg $^{-1}$	16.8	2.1	12.5
3.	MOC, ml/min.kg $^{-1}$	50.5	4.9	9.7
4.	IOR, %	24.6	5.7	23.2
5.	IOA, conv.un.	16.8	2.9	17.3

Mean value of indicator PWC $_{170}$ (V) – 3.1 ± 0.4 m/sec reflects physical workability of football players, who yield to sportsmen of cyclic kinds of sports by this indicator, at training of whom great attention is paid to running trainings and whose indicators PWC $_{170}$ (V) are within 4.0–5.0 m/sec. Mean values of indicator PWC $_{170}$ for football players – members of KNEU combined team was 16.8 ± 2.1 kgm/min.kg $^{-1}$.

Mean MOC, which characterizes sportsmen's functional fitness was 50.5 ± 4.9 ml/min.kg^{-1}, that practically coincide with data, which were received at testing of outdoor games' sportsmen of 1st degree (by V.L. Karman, Z.B. Belotserkivskiy, I.A. Gudkov) 50±1 ml/min.kg^{-1}[4].

Concerning such indicators as index of operative restoration (IOR) and index of operative adaptation to training loads (IOA) their mean values were respectively 24.6 ± 5.1 % and 16.8 ± 2.9 conv.un. The higher are these indicators the better if football players fitness.

Conclusions:

For effective control over training of students-football players appropriate criteria are required, which, on the one hand would objectively reflect fitness of sportsmen and, on the other hand, would be simple and easy. It would permit to determine physical workability, functional fitness and operative adaptation to physical loads of teams' players directly in training camps by coaches. For this purpose, in training process run variant of test PWC $_{170}$ (V), can be used, as well as such criteria as index of operative restoration (IOR) and index of operative adaptation to training loads (IOA).

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