

FUNCTIONAL EXAMINATION OF FUTSAL PLAYERS

Milen Gadzhev

UNWE, Sofia, Bulgaria, milen_gazhev@unwe.bg

Ivan Stoilov

UNWE, Sofia, Bulgaria, i.stoilov@unwe.bg

Vasil Tsvetkov

NSA Vasil Levski, Bulgaria, vas.tsvetkov@gmail.com

Abstract: Futsal is developing very quickly, proof of it being its inclusion into the programme of the Youth Olympic Games in Buenos Aires in 2018. UNWE in the recent years gives an opportunity to the students in the university to compete on the highest level in futsal championship of Bulgaria. The aim of the examination is to establish the level of the functional condition and body structure of futsal contestants – amateurs. All tests have been conducted in NSA “Vasil Levski”, in a Center for scientific and applying activity in sport. The loading was carried out on Tredban H/P Cosmos (Germany) as per Prof. Dr. Ilchi Iliev’s Record(duration of step 1.30’, initial speed 6 km/h, acceleration of runway on each step by 1.2 km/h, with constant tilt of 2.5 %). Spiroergometric indices and results of gas analysis are registered in real time (breath – by – breath) by metabolic analyzer Jaeger – Pro (Germany). ECG has been studied at rest prior loading, during loading and up to the 5th minute from recovery. Anthropometric data show BMI of result $23,6 \pm 1,54$, height – $177,05 \text{ (cm)} \pm 4,09 \text{ (cm)}$ and weight $74.1 \text{ (kg)} \pm 5,80 \text{ (kg)}$. Body fats $11.83 \pm 3,66$ are within normal ranges. All investigated contestants show good and very good hydration of organism TBW (KG) $47,79 \pm 3,77$. Functional fitness is rated as per the value of the reached peak (maximum) oxygen consumption as follows: LOW, AVERAGE, GOOD, VERY GOOD AND EXCELLENT, the excellent being the one of elite sportsmen of world’s rank, very good – of international rank (national teams), good – of club’s rank. Functional fitness of investigated contestants is defined as good, which corresponds to contestants of club’s rank. VO2 max (ml/kg/min) is of average value 54, $17 \pm 6,14$. Values of the examined persons are lower, but the same approach those demonstrated by elite futsal contestants (Barbero – Alvarez JC, et al., 2007, Tsvetkov V. et al. 2018). The average value – $15,32 \text{ (km/h)} \pm 1,77 \text{ (km/h)}$ of the maximum speed reached, approaches the values registered by the elite contestants, the maximum result of 18,8 km/h, demonstrated by one of the contestants from UNWE, is on a level – elite contestants of international rank.

Keywords: futsal,functional condition, anthropometry

1. INTRODUCTION

Futsal was elaborated in 1930 in Uruguay by Carlos Ceriani. After Uruguay won the gold medals on football on the World Championship in 1930 and the gold of the Olympic Games in 1924 and 1928, the interest towards the game became enormous. The aim of Ceriani was to elaborate a team game similar to football that could be played indoors. Ceriani worked out rules, combining football rules (possibility for the ball to be touched by each part of the body, except the hands), basketball (number of contestants), water ball (40 play minutes) and handball (size of the field). The game was enjoyed by the practicing ones and after several years, in 1936 some countries from South America organized futsal tournaments between themselves.

In 1954 the different regions in Brazil united around general futsal rules setting the beginning of a serious boom of the game. Since 1965 championships of South America have started taking place regularly. In 1971 on an initiative of Latin America countries, International Football Indoors Federation was established (FIFUSA) in Sao Paolo, Brazil. In 1985 FIFA decided to include futsal in the big football family too. In 1989 the first World futsal championship was held under the aegis of FIFA in Holland. Shortly after that the rules of the game underwent some changes, aiming to make it still more exciting. In 2005 the first seminar of FIFA was held for futsal trainers.

Since then until now, futsal is developing extremely quickly, proof of that being its inclusion into the programme of the Youth Olympic Games in Buenos Aires in 2018(Gioldasis A. 2016), considering the possibility for the game to be a part of the programme of the Summer Olympic Games..

Futsal in Bulgaria was manifested in the end of the last century, using the name mini-football. The first matches and tournaments were in the format 6:6 or 7:7. Gradually the game attracts more and more persons wishing to practice it, which imposed the establishment of a Mini-football Federation. Its role is to organize and administrate tournaments and events in the field of futsal. In the end of 90-ties the Mini-football Federation was reduced to Futsal Committee, having a direct control on all happening to futsal in our country until this date.

In our country futsal with its official name occurred in 2003 and the state futsal championship is dating since then. Throughout the years, the formats of holding the championship have been changed repeatedly, but always leading forces are the teams from Sofia and Varna, and all country champions coming out of them.

The team of UNWE was established in 2009 by Ivan Stoilov, a Lecturer in the Department Physical culture and sports, with the University. The team is entirely amateur one giving a chance for manifestation of students from the educational groups on Physical culture and sports. It is wide known that the trainers play a decisive role in the life of young sportsmen and have a potential to influence, positively or negatively on their sport experiences (Bruner et al., 2011). Students acquire a number of skills when practicing a sport in the University (Kasabova, 2011), increase their sport qualification and as a consequence of that increase the results in competitions (Ivanov and coll., 2014). This is the main task before the team of UNWE, to give an opportunity to students in the University to compete on the highest level. The team participated for two years, in the period 2009 – 2011 in the amateur futsal league, organized by Bulgarian Mini Football Association. From season 2012/2013, UNWE is a participant at futsal championships of Bulgarian Sport Federation (BSF) – Towns and National League. Just prior including the team at the championship of BSF, we decided to make functional examinations of contestants, in order to establish the level of the functional condition and body structure of contestants futsal amateurs. Along with the requirements for good physical preparation, the contestants should possess good theoretical preparation, practical trainings should be directed towards building up of certain habits and skills, but of extreme importance is the existence of certain personal characteristics for a successful professional realization (Stavrev, S, 2011; Staykov, N, 2018).

2. AIM, ORGANIZATION AND METHODS OF EXAMINATION

2.1. Aim of investigation

The aim of the examination is to establish the level of functional condition and body structure of futsal contestants – amateurs.

2.2. Object of investigation

Object of the investigation have been students from the UNWE that are a part of the representative futsal team of the university. In the examination participated 10 contestants of the age 17 – 31 years.

2.3. Organization of the examination

All tests have been held in the NSA “Vasil Levski”, in the Center for scientific and applying activity in sport. Investigation was held in March 2011. Contestants have been subjected to Spiroergometric test with step loading until refusal for defining of their functional fitness. Loading was carried out on Tredban H/P Cosmos (Germany) as per Prof. Dr. Ilchi Iliev’s Record (duration of step 1.30’, initial speed 6 km/h, acceleration of runway on each step by 1.2 km/h, with constant tilt of 2.5 %). on a Record of Prof. Dr. Ilchi Iliev (duration of step 1.30’, initial speed 6 km/h, acceleration of runway on each step by 1.2 km/h, with constant tilt of 2.5 %). Spiroergometric indices and results of gas analysis are registered in real time (breath – by – breath) by metabolic analyzer Jaeger – Pro (Germany). ECG has been studied at rest prior loading, during loading and up to the 5th minute from recovery. Blood specimen for examination of lactate has been taken from a hand finger at rest prior loading in 1st, 3rd, 5th and 8th minute after the refusal.

On the same day, prior the test, several anthropometric measures have been carried out, as well as an apparatus analysis of the body content (Tanita 18, Japan).

Ten futsal contestants of the age 17 – 31 years have been examined. Contestants have been subjected to spiroergometric test with step loading until refusal for defining of their functional fitness. Loading was carried out on Tredban H/P Cosmos (Germany) as per Prof. Dr. Ilchi Iliev’s Record (duration of step 1.30’, initial speed 6 km/h, acceleration of runway on each step by 1.2 km/h, with constant tilt of 2.5 %).

2.4. Methods

Spiroergometric indices and results from the gas analysis have been registered in real time (breath – by – breath) by metabolic analyzer Jaeger – Pro (Germany). ECG has been studied at rest prior loading, during loading and up to the 5th minute from recovery. Blood specimen for examination of lactate has been taken from a hand finger at rest prior loading in 1st, 3rd, 5th and 8th minute after the refusal.

On the same day, prior the test, several anthropometric measures have been carried out, as well as an apparatus analysis of the body content (Tanita 18, Japan).

Results from the anthropometric examinations have been presented in reprints from the respective examinations.

Functional fitness is graded according to the value of the achieved peak (maximum) oxygen consumption as follows: LOW, AVERAGE, GOOD, VERY GOOD AND EXCELLENT, the excellent being the one of an elite sportsman of world’s rank, very good – of international rank (national teams), good – of club’s rank. It should be taken into consideration that the maximum oxygen consumption is not the only one defining the functional fitness and sport achievements.

The data got has been subjected to mathematical-statistical processing, applying a variation analysis.

3. ANALYSIS OF THE RESULTS

Results are presented in Table 1. Strong homogeneity of the excerpt is observed, proved by the indices of variation. Values of asymmetry (As) and excess(Ex) are with normal distribution. Coefficient of variation shows a strong homogeneity for the indices Height, weight, BMI, BMI, FFM KG, TBW KG and Maximum pulse frequency and comparative homogeneity for the indices Age, VO2 max/W, ml/min,ml/kg/min and V max. The only heterogeneity is observed as regards the index FAT%. This index does not fall in the range of our examination.

The individuals examined are of the age between 17 and 31 years. The anthropometric data show BMI result $23,6 \pm 1,54$, height – $177,05 \text{ (cm)} \pm 4,09 \text{ (cm)}$ and weight $74.1 \text{ (kg)} \pm 5,80 \text{ (kg)}$. Body fats $11.83 \pm 3,66$ are within the normal limits and only two contestants need losing % of body fats. All contestants examined show good and very good hydration of organism TBW (KG) $47,79 \pm 3,77$. Functional fitness of contestants examined is defined as good, corresponding to contestants from club's rank. VO2 max (ml/kg/min) is of average value $54, 17 \pm 6,14$. Values of the individuals examined are lower, but they come close to those demonstrated by the elite futsal contestants, in the investigations of (B. M. Baroni, P. Leal. Junior, 2010; Castagna C. et al., 2009; Barbero – Alvarez JC, et al., 2008) giving us a reason to deem the functional level of the examined Bulgarians good, taking into consideration their amateur status. The average value – $15,32 \text{ (km/h)} \pm 1,77 \text{ (km/h)}$ of the maximum speed achieved comes close to the values registered by the elite contestants, the maximum result of 18,8 km/h, demonstrated by a contestant from the UNWE is at the level – elite contestants of international rank. The average value of maximum pulse frequency is $191,4 \text{ (b/min)} \pm 10,59 \text{ (b/min)}$. Examinations (Stoilov, I. 2012.) show that with futsal contestants, over 50% of the playing time, contestants' pulse varies in the range over 85% of the maximum pulse (HR max). In such examination (Barbero – Alvarez JC, et al., 2007) has established that with elite contestants, in 83% of the duration of matches, the pulse frequency varies in the range over 85% of HR max.

Table 1.

Index	N	X min	Xmax	R	□□	S	V	As	Ex
Age	10	17	31	14	24.2	3.88	16.04	-0.189	0.805
Height	10	172	185	13	177.05	4.09	2.31	0.869	0.054
Weight	10	64.7	82.3	17.6	74.1	5.80	7.83	0.08	-0.755
BMI	10	21.6	26.3	4.7	23.6	1.54	6.54	0.429	-0.857
FAT%	10	4.4	16.5	12.1	11.83	3.66	30.90	-0.99	0.739
FFM KG	10	60.3	72.9	12.6	65.29	5.13	7.85	0.622	-1.526
TBW KG	10	44.1	53.4	9.3	47.79	3.77	7.89	0.62	-1.515
VO2 max/W	10	9.68	16.01	6.33	13.196	2.02	15.28	-0.296	-0.034
ml/min	10	3168	5076	1908	4027.7	659.17	16.37	0.308	-1.411
ml/kg/min	10	43.6	63	19.4	54.17	6.14	11.33	-0.292	-0.542
V max	10	13.2	18.8	5.6	15.32	1.77	11.55	0.684	0.088
HR max	10	176	206	30	191.4	10.59	5.53	-0.004	-1.419

In Table 2, are illustrated the values of concentration of lactate and change during the test respectively for 1st, 3rd and 5th minute. The data has been subjected to statistical smoothing. Values of indices at 8th and 11th minute from the test do not allow making statistical analysis, due to the excessively high variation values. With the investigated indices, normal distribution is observed, and values of As and Ex are within the norm. Coefficient of variation defines the excerpt as significantly homogeneous..

Table 2.

Index	N	X min	Xmax	R	□□	S	V	As	Ex
Initial	10	1	2	1	1.4	0.31	22.08	0.846	0.226
1'	10	8.9	17.8	8.9	13.38	3.89	29.08	0.076	-2.05
3'	10	6	13.6	7.6	10.47	2.27	21.64	-0.518	0.543
5'	9	6.2	13.9	7.7	10.23	2.68	26.20	0.005	-1.005

The average value of the lactate level prior the beginning of the test is 1,4 (mMol/l). It is within the normal limits, values between 1,2 – 2 mMol/l. Of interest are the values after finishing the loading. On the 1st min after the refusal the average value is 13,38 mMol/l and on the 5th min it is 10,23 mMol/l. It shows that the loading from the functional examination enters in forth energy-supply zone (anaerobic – glycolytic supply). Loading is characterized by the active participation of muscle fibers of type IIb and by the sudden discrepancy between the increased needs by oxygen and the limited possibilities of its supply. In this energy-supply zone, the level of La in the blood is the highest and VO₂max reaches maximum values.

4. CONCLUSIONS

Anthropometric data of the examined individuals show that the group is homogeneous as regards the anthropometry. Contestants of UNWE have good body structure, the average value of BMI – 23,6 is an index demonstrating that the group examined is with normal weight, corresponding to active sportsmen. Of course, there are certain individuals examined to whom decreasing of weight is recommended.

As regards the functional fitness, it could be claimed that the examined persons demonstrate average functional fitness. Taking into consideration that the examined contestants are amateurs, we deem that the registered values are a good base for achieving of good results in the concrete sport. VO₂ max (ml/kg/min) is with average value 54,17±6,14. Values of the examined persons are lower, but come close those demonstrated by elite futsal contestants (Barbero – Alvarez JC, et al., 2007, Tsvetkov V. et al. 2018). The average value – 15,32 (km/h) ± 1,77 (km/h) of the maximum achieved speed comes close to the values registered by the elite contestants, and the maximum result of 18,8 km/h, demonstrated by one of the contestants of UNWE is on level – elite contestants from international rank.

Initial level of La in the beginning of the examination is of normal value – 1,4 mMol/l. All contestants reach levels of La, that indicate loading by anaerobic – glycolytic supply, average value of 1 min after the refusal 13,38 mMol/l. Within the range of 8th minute after finishing the test, indices of all contestants demonstrate normalizing of the values of La in the blood, which again is an index of good organism training.

We could summarize that the indices from the examination carried out of futsal contestants give a reason to assert that the examined individuals have good functional fitness, corresponding to contestants of clubs rank. The persons examined throughout the years after the examination carried out succeeded winning a number of medals on national and international level, confirming the thesis that they possess good potential for manifestation at a particular sport activity.

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