ANTHROPOMETRIC, PHYSICAL AND TECHNICAL PROFILES OF JUNIOR HANDBALL GOALKEEPERS

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Abstract

The aim of this paper was to determinate the anthropometric, physical and technical profiles of young handball goalkeepers that belong to National Handball Team of Romania, at the level – junior II. In this sense, we established a set of tests and measurements to highlight their characteristics. The subjects (n = 3, aged between 16 and 17 years) are handball goalkeepers that belong to University Sport Club Of Suceava. In the same time, they are part of National Handball Team of Romania and members of the National Olympic Training Center for Juniors in Handball Suceava. The results obtained from the evaluation, highlight a very good development of the goalkeepers. The data collected exceed the model presented by the Romanian Handball Federation. For example, the best values were recorded in height (X=191.33), armspan (X=194), handspan (X=22) and others. An appropriate physical potential helps the goalkeepers execute more easily the technical elements and obtain in a short time the adaptation of the organism to physical and mental efforts.

Introductions

Handball involves a varied technique and a large number of spectacular actions, which has led to many concerns worldwide regarding this sport. The recent years have seen a considerable increase in the speed of actions performed by handball players. Matches are played faster, and technical and tactical elements are performed more dynamically and within a shorter time [1]. All this determined the need to start practicing the game from an early age, in a specialized position.

Modern performance sports, in general, and handball in particular, require a continuous increase in the level of skill, which determines allocation a longer time to training. This aspect leads to the beginning of the specialized selection from childhood. The criteria according to which the selection is made are systematized differently depending on the factors to which it is addressed. Four categories of selection criteria are recommended: medical-biological criteria, somatic criteria, motor criteria and psychological criteria. Among to the morphological parameters

involved in the selection, the most important are: body structure, height, proportions of body segments and somatosexual type [2].

The selection requires the knowledge of the players' particularities and the correspondence of these particularities with the requirements of the sports activity [3]. An appropriate physical potential helps the handball players to execute more easily the technical-tactical elements and to obtain in a short time the adaptation of the organism to physical and mental efforts [4].

Handball players are characterised by considerable physical strength and speed, features which prove invaluable when it comes to performance. So, training and selection play an important role among handball players [5]. In coaching communities, it is well recognized that goalkeepers'performances can predict team ranking in major tournaments [6,7]. The goalkeeper is the last player who can stop the opponent team from scoring a goal; in other words, he presents the "last instance" and embodies an individualist in the team [8]. In short, the main tasks of the goalkeeper are to prevent the ball from entering the goal and to organize the counterattack, so that the goalkeeper's playing technique is divided into defense technique and attack technique [9].

The goalkeeper plays an important role in a handball team. His movements must be coordinated as simple and economical as possible. The short distance from the players attacking his goal requires reflex and courage, but also the ability to predict the flight of the ball and cooperate with the defence. Goalkeepers should move appropriately, assume suitable positions and have a general feeling for the game [10].

In handball, the goalkeeper is an unusual position in that it requires very quick responses to the opponents' handling of the ball. In addition to technical and tactical preparation, the effectiveness of intervention relies on a short reaction time, motor time and the anticipation of the opponent's throwing behaviour [11]. Goalkeepers in team handball perform solely and must concentrate on a quick and explosive execution of a movement in a restricted space, as it is important for the acceleration of his body and his arms [12].

Material and method

Aim of research. The aim of this paper was to determinate the anthropometric, physical and technical profiles of young handball goalkeepers that belong to National Handball Team of Romania, at the level – junior II. In this sense, we established a set of tests and measurements to highlight their characteristics.

Subjects. *T*he subjects (n = 3, aged between 16 and 17 years) are handball goalkeepers that belong to University Sport Club Of Suceava. In the same time, they are part of National Handball Team of Romania, at the level junior II and members of the National Olympic Training Center for Juniors in Handball Suceava. In this Olympic Center i train the goalkeepers to get the best results in competitions.

Tests performed. For the anthropometric profile we used: Body height, Sitting height, Body weight, Body Mass Index (BMI), Muscule mass, Fat mass, Arm span, Hand span and Leg Length.

For evaluating the physical and technical-tactical level we used:
- Squat Jump (SJ) – involves a vertical jump;
- Standing broad jump (SBJ) – involves a long jump;
- Sit-ups in 30 second – tests the muscular abdominal endurance;
- Mouvement in a triangle 3 courses (MT) – test proposed by the FRH (Romanian Handball Federation);
- Throwing the ball with three step momentum (TBSM) – test proposed also by the FRH;
- Throwing the ball at a fixed point (TBFP) – involves passing the ball to a player who is in the middle of the field, running towards the opponent's goal (the ball is thrown 10 times);
- Speed 5x30 meters with breaks of 30 seconds between repetitions – the arithmetic mean of the 5 runs is calculated;
- Running Speed 15 meters.

The research methods: method of study of specialized literature, method of analysis, measurement method, test method, graphical method, tebel method, statistical – mathematical method.

Results

The results obtained from the evaluation highlight a very good development of the goalkeepers. The data collected exceed the model presented by the Romanian Handball Federation. In table 1 are shown the somatic data of the goalkeepers an in the table 2 are shown the physical and technical data.

Table 1. Anthropometric profile

Measurements	Name and surname			Statistical indicators		
	P.D	S. F	L.Ș			
Age (years)	17	17	16	X	SD	CV
Body height (cm)	191	189	194	191.33	2.51	0.01

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Sitting height (cm)	92	88	88	89.33	2.30	0.02
Body weight (kg)	108	91.1	72.2	90.43	17.90	0.19
BMI (kg/m2)	29.8	25.5	19.2	24.83	5.33	0.21
Muscule mass (%)	35.9	37.1	43.5	38.83	4.08	0.10
Fat mass (%)	25.1	23.8	9.3	19.4	8.77	0.45
Arm span (cm)	200	197	191	196	4.58	0.02
Hand span (cm)	23	22	21	22	1.02	0.04
Leg length (cm)	99	101	106	102	3.60	0.03
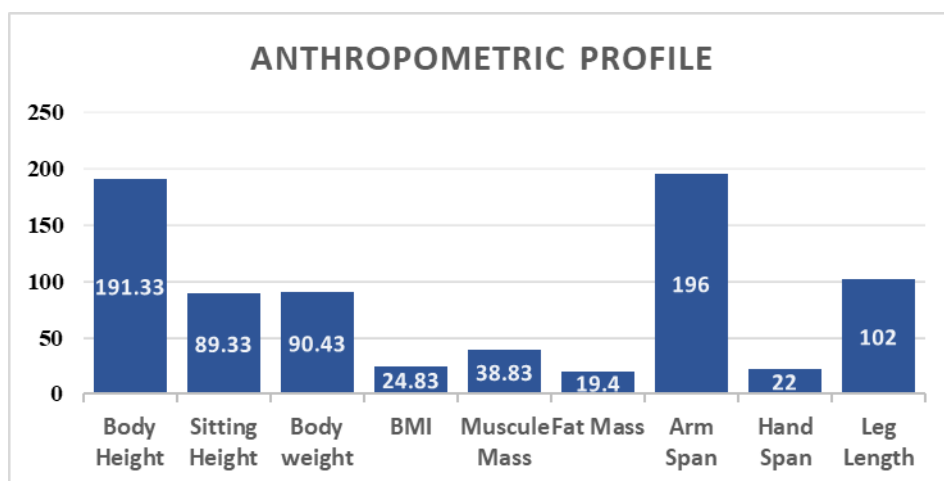
Graphic 1. Anthropometric profile – junior goalkeepers

As we can see in table 1 and graphic 1, the goalkeepers' values are very good. The mean of height is 191.33 centimeters and he mean of armspan exceeds the mean of height ($X = 196$ cm). We also notice a very high percentage of muscle mass ($X = 28.83\%$) and a low percentage of fat mass ($X = 19.4\%$). According to the model of the Romanian Handball Federation, the profile of the goalkeepers is better.

Table 2. Physical and technical profile

Tests	P.D	S. F.	L.Ş	Statistical indicators		
				X	SD	CV
SJ (cm)	43	39	42	41.33	2.08	0.05
SBJ (cm)	222	210	206	212.66	8.32	0.03
Sit-ups (reps)	33	28	30	30.33	2.51	0.08
MT (s)	17.14	17.43	17.27	17.41	0.13	0.007

TBSM (m)	46	45	40	43.66	3.21	0.07
TBFP (reps)	10	10	10	10	0	0
5 X 30m (s)	4.34	4.42	4.39	4.36	0.03	0.008
15 m (s)	2.30	2.52	2.33	2.38	0.11	0.05
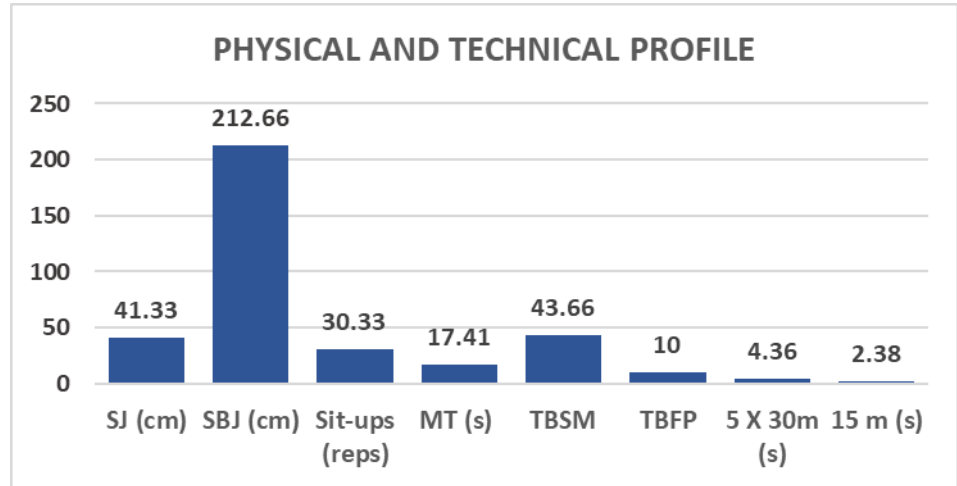
Graphic 1. Physical and technical profile – junior goalkeepers

Both at the physical and at the technical tests, the three goalkeepers obtained a value very close to each other. They demonstrated a very good specific running speed (X =4.36 seconds and X =2.38 seconds), an explosive force (X= 41.33 centimeters and 212.66 centimeters) and a force of the arms and of abdominal muscle.

Conclusions

The selection and training of goalkeepers is a difficult task for coaches. It is difficult to specify which is the ideal type of athlete in this position. Some coaches prefer tall goalkeepers, others prefer heavier goalkeepers, while another category of coaches have affinities for shorter and slimer goalkeepers, considered faster.

The results obtained from the evaluation highlight a very good development of the goalkeepers. The data collected exceed the model presented by the Romanian Handball Federation. Our goalkeepers are at a high level, they get very good results in competitions of any level. This aspect is due to a good selection, but also to a preparation that targets all their components.

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