

DIFFERENCES IN BODY MEASUREMENTS BETWEEN U18 AND U16 HANDBALL PLAYERS FROM UNIVERSITY SPORTS CLUB OF SUCEAVA

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Abstract

The present study aimed to evaluate the anthropometric profile of male handball players in Category Junior Team of University Sports Club of Suceava and then make the difference in body measurement between U18 and U16. The sample of participants consisted of 29 male junior handball players, divided into two groups: 17 handball players U18 (age 16.76 ± 0.43 years) and 12 handball players U16 (age 14.58 ± 0.66 years). Nine anthropometric measures, defining the four latent morphological dimensions, were used. Significant differences were revealed in five morphological measures: body height ($p = .03$), muscle mass ($p = .00$), arm span ($p = .03$), leg length ($p = .01$) and hand span ($p = .03$). There were no significant differences in body weight ($p = .33$), body mass index ($p = .90$), fat mass ($p = .43$) and sitting height ($p = .25$).

Introduction

Players' constitution or anthropometry, belongs to the so-called internal factors of playing performance, together with sex, age, genetics, maturity and physiological functioning of players [1]. Anthropometrical characteristics and body composition of athletes have been the subject of many investigations as many researchers concluded that through a long process of systematic training, the organism, in morphological and functional sense, adapts to exposed influences [2].

Various athletic events require different body types to achieve maximum performance and every athlete should have specific anthropometrical characteristics and body composition figures for his own sports discipline [3, 4]. Many studies have shown that specific anthropometric characteristics are significantly associated with success in sports and is approved that morphological

characteristics are of particular importance for orientation and selection in most sports discipline [5, 6].

Therefore numerous studies have shown that body composition and anthropometric measurements are determinant in youth and senior handball players. More exactly, anthropometric characteristics have been shown to be decisive in indoor handball in junior and senior teams [7, 8, 9].

Handball has developed a lot in recent years, at the all junior levels. It requires very well-developed players, with great height and wingspan and special physical qualities (speed, coordination, expansion, explosive strength). The anthropometric parameters according to which the selection is made are more and more strict. However, pronounced longitudinal dimensions, especially body height and wingspan, may be more important for backs, whereas a higher speed of movement and reaction is apparently more important for wings [10, 11].

Also, in addition to height, the authors found that, in sports like handball which is a gravitational sports, adequate body composition and body mass figures, among other factors, contribute to optimal exercise routines and performance [12, 13]. Consequently, it is now well-established that elite handball players should have high stature and body mass [14]. This is due to the fact that the game has become very strong and aggressive, and to cope with the demands, a strong body is required.

Material-method

The present study aimed to evaluate the anthropometric profile of male handball players in Category Junior Team of University Sports Club of Suceava and then make the difference in body measurement between U18 and U16.

Sample of subjects. The sample of participants consisted of 29 male junior handball players, the members of the University Sports Club Suceava, who had been evaluated beforehand by their coaches. The date on which the body measurements were made was March – April 2021. The sample of participants was divided into two groups: 17 handball players U18 (age 16.76 ± 0.43 years) and 12 handball players U16 (age 14.58 ± 0.66 years). Most of them participated in the preparation camp of the U18 National Team of Romania. Out of the total sample of U18 (N=17), four were wingers (W; n=4), six backcourt players (B; n=6), three center players (C; n=3), two pivots (P; n=2) and two goalkeepers (G; n=2). Out of the sample of U16 (N=12), four were wingers (W; n=4), three backcourt players (B; n=3), two centers (C; n=2), one pivot (P; n=1) and two goalkeepers (G; n=2).

All subjects were assessed for the anthropometric measures required for the calculation of body composition variables, using the standardized procedures recommended by established literature.

Sample of variables. Nine anthropometric variables were chosen: Body height (cm), Body weight (kg), BMI (kg/m²), Fat mass (%), Muscule mass (%), Sitting height (cm), Arm span (cm), Leg length (cm) and Hand span (cm).

The research methods: method of study of specialized literature, method of analysis, test and measurement method, graphical method, tabel method, statistical and mathematical method

Data analyses. Basic statistical methods were utilised to compute the descriptive indicators of variables – arithmetic mean (X), standard deviations (SD), coefficient of variability (CV), minimum value (Min) and maximum value (Max) for the entire sample. To render the statistical significance of the differences we used the Student Test. The degree of freedom was 27 (n-2) and during the significance threshold (p) 0.05, the t critical two-tail value was 2.05.

Results

In tables 1 and 2 are presented the results of the descriptive data of all participants. Table 1 shows the means (X), standard deviations (SD), coefficient of variability (CV), minimum value (Min) and maximum value (Max) for the under 18 (U18) juniors players. Table 2 shows descriptive data for the under 16 (U16) juniors players.

Table 1 Descriptive data U18

	Antropometrics	Statistical analisis			
		X±SD	CV	Min	Max
1.	<i>Body height (cm)</i>	189.82±7.41	3.90	175	203
2.	<i>Body weight (kg)</i>	82.03±12.51	15.25	64.2	108.6
3.	<i>BMI (kg/m²)</i>	23.19±3.15	13.62	19.2	29.8
4.	<i>Fat mass (%)</i>	15.3±6.82	44.62	5.9	28
5.	<i>Muscule mass (%)</i>	41.47±2.97	7.18	35.4	44.6
6.	<i>Sitting height (cm)</i>	89.05±4.23	4.75	82	96
7.	<i>Arm span (cm)</i>	189.29±8.64	4.56	173	201
8.	<i>Leg length (cm)</i>	100.76±5.78	5.76	92	110
9.	<i>Hand span (cm)</i>	20.70±1.06	4.75	19	23

Table 2 Descriptive data U16

	Antropometrics	Statistical analisis			
		X±SD	CV	Min	Max
1.	<i>Body height (cm)</i>	182.25±10.59	5.81	168	201
2.	<i>Body weight (kg)</i>	77.32±12.84	16.61	59.8	99.6
3.	<i>BMI (kg/m²)</i>	23.06±1.94	8.41	20.9	26.2
4.	<i>Fat mass (%)</i>	17.04±3.81	22.40	12.5	23.3
5.	<i>Muscule mass (%)</i>	37.50±2.52	6.72	33.36	41.89

6.	<i>Sitting height (cm)</i>	87±5.23	6.02	81	96
7.	<i>Arm span (cm)</i>	181.33±10.22	5.64	169	200
8.	<i>Leg length (cm)</i>	95±6.31	6.64	88	108
9.	<i>Hand span (cm)</i>	19.83±1.11	5.62	18	22

Table 3 Statistical analysis - intergroup differences

Indicator	t	p-value
<i>Body height (cm)</i>	-2.26	.03
<i>Body weight (kg)</i>	-0.98	.33
<i>BMI (kg/m²)</i>	-0.12	.90
<i>Fat mass (%)</i>	0.79	.43
<i>Muscle mass (%)</i>	-3.75	.00
<i>Sitting height (cm)</i>	-1.16	.25
<i>Arm span (cm)</i>	-2.27	.03
<i>Leg length (cm)</i>	-2.64	.01
<i>Hand span (cm)</i>	-2.22	.03

Discussions

As we can see in the tables from above, significant differences were revealed in five morphological measures between the two groups of male juniors. We observe that there are significant difference in body heigh (p =.03), muscle mass (p =.00), arm span (p =.03), leg length (p =.01) and hand span (p =.03).

Also, we can see that there were no significant differences calculated between under 18 and under 16 handball junior players in body weight (p =.33), in body mass index (p =.90), fat mass (p =.43) and at the sitting height (p =.25). The results are different but statistically insignificant.

Conclusions

Correct assessment of body is important since errors may lead to mistakes in training prescription and affect the performance. Handball players need specific training that allows them to do complex physical tasks and like other team sports, physical development and morphological indication playing important roles in developing efficiency in the game.

Through our study, we tried to see if the results from one level to another (from U 16 to U18) are significant and if physical development is an important indicator of performance. It has been shown that there are no significant changes in many anthropometric measurements, but what conditions the performance of older players is more advanced techniques and the degree of development of handball-specific motor qualities

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