

## COMPARATIVE STUDY REGARDING AGILITY BETWEEN U18 AND U16 HANDBALL PLAYERS FROM UNIVERSITY SPORTS CLUB OF SUCEAVA

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### **Abstract**

The purpose of this study was to evaluate the agility and the running speed of male handball players in Category Junior Team of University Sports Club of Suceava and then make the comparison between the results obtained by players from U16 and those from U18. The sample of participants consisted of 32 male junior handball players, divided into two groups: 18 handball players U16 (age  $15.27 \pm 0.57$  years), and 14 handball players U18 (age  $17.14 \pm 0.77$ ). To test agility we used Illinois Test that involves various turns and movements. At the end of the research, it was shown that there were no significant differences calculated between under 18 and under 16 handball junior players in agility ( $p = .38$ ). Even if there was a difference between arithmetic means ( $17.49 \pm 1.52$ ;  $17.08 \pm 0.97$ ), that was not statistically significant.

### **Introduction**

Characteristics of handball are high intensity body-contact and well-coordinated activities. Handball is one of the fastest sports which requires endurance. It is characterized by different movements such as jumping, running, shooting under the pressure, faking against hard defence players and attempting fast breaks despite all the fatigue [1, 2, 3]. Handball is a team sport played in an indoor field and requires a high standard of aerobic and anaerobic fitness in order to complete 60 minutes of a competitive game and achieve success through an intermittent high intensity body-contact and well-coordinated activities. It is said that is one of the fastest and the most endurance required team sports. [3, 4].

Agility is an important component of many team sports, though it is not always tested, and is often difficult to interpret results. Tests on agility, running and accelerating speed and explosive power are very often applied to athletes who play sports games. Some authors described in their studies as handball, football, basketball, and tennis players are expected to generate in intervals high values of muscle power (sprints) in order to respond to specific playing situations, alternated by periods of low physical activity [5, 6].

Agility is trainable in youth, and specifically for handball. The dependence between the physiological profile of handball players and their playing position as well as their sport level has been examined. Authors reached the conclusion that a dependence between body composition, physical performance abilities, and playing position of handball players [7].

On the same note, another studies demonstrate that the age and playing position have a significant impact on physical fitness in handball. There are studies that confirms the impact of the playing position on the results achieved in agility tests. The values may become of practical use for handball coaches in the ongoing control of the athlete's power-speed preparation in junior category (from U16 to U19) as well as assignment to the playing positions [8].

### **Material-method**

*The purpose* of this study was to evaluate the agility and the running speed of male handball players in Category Junior Team of University Sports Club of Suceava and then make the comparasion between the results obtained by players from U16 and those from U18.

*Sample of subjects.* The sample of participants consisted of 32 male junior handball players, the members of the University Sports Club Suceava. The sample of participants was divided into two groups: 18 handball players U16 (age  $15.27 \pm 0.57$  years, height  $176.83 \pm 7.57$ , weight  $71.44 \pm 12.83$ ) and 14 handball players U18 (age  $17.14 \pm 0.77$  years, height  $189.29 \pm 9.41$ , weight  $86.57 \pm 15.84$ ). Most of them participated in the preparation camp of the under 18 National Team of Romania and in recent years, they have won National Championships in the junior categories.

*Procedures.* To test agility we used Illinois Test that involves various turns and movements. The Illinois Agility Test is a commonly used test of agility in sports, and as such there are well-established norms available. The length of the course is 10 m and the width is 5 m. Four cones are used to mark the start, finish and the two turning points. Another four cones are placed down the center, spaced 3.3 meters apart. Subjects should lie on their front and hands by their shoulders, gets up as quickly and runs forwards 10 m to run around a cone, then back 10 m, then runs up and back through a slalom course of four cones. Finally, the athlete

runs another 10 m up and back past the finishing cone, at which the timing is stopped. The results were recorded in seconds [9, 10].

All of them gave their written consent and the local ethics committee approved the protocol of the study. The data on which the measurements were made was September-October 2021.

*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 30 (n-2; 32-2) and during the significance threshold (p) 0.05, the t critical two-tail value was 2.04.

## Results

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

Table 1. Descriptive data U16 – Illinois agility test

No	Initials	Positions	Height	Agility Values
1	P.D	C	168	17.15
2	H.S	G	169	17.32
3	M.A	G	177	17.46
4	B.R	C	178	16.90
5	D.C	W	170	17.30
6	O.R	C	164	17.42
7	C.C	B	174	16.54
8	C.I	B	170	19.03
9	B.R	B	182	21.75
10	H.A	G	180	19.98
11	H.A	G	172	16.09
12	Z.N	B	183	18.30
13	R.R	G	189	17.50
14	C.V	W	188	17.17
15	R.A	C	185	15.90
16	I.T	W	170	15.55
17	Z.C	G	186	17.54

<i>18</i>	<i>T.A</i>	<i>W</i>	178	15.94
<b>X±SD</b>			176.83±7.57	17.49±1.52
<b>CV</b>			4.28	8.72
<b>Min</b>			164	15.56
<b>Max</b>			189	21.75

B – backs, G – goalkeepers, P – pivots, W – wings, C – center

Table 2. Descriptive data U18 – Illinois agility test

<b>No</b>	<b>Initials</b>	<b>Positions</b>	<b>Height</b>	<b>Agility Values</b>
<i>1</i>	<i>T.M</i>	<i>P</i>	201	17.39
<i>2</i>	<i>R.C</i>	<i>B</i>	191	15.26
<i>3</i>	<i>F.C</i>	<i>P</i>	204	18.10
<i>4</i>	<i>P.D</i>	<i>G</i>	190	18.44
<i>5</i>	<i>N.B</i>	<i>C</i>	188	17.54
<i>6</i>	<i>D.F</i>	<i>P</i>	187	16.54
<i>7</i>	<i>S.C</i>	<i>W</i>	170	17.17
<i>8</i>	<i>H.A</i>	<i>B</i>	191	15.40
<i>9</i>	<i>S.F</i>	<i>G</i>	188	17.38
<i>10</i>	<i>L.Ș</i>	<i>G</i>	196	16.37
<i>11</i>	<i>C.L</i>	<i>B</i>	187	16.50
<i>12</i>	<i>P.C</i>	<i>W</i>	171	17.25
<i>13</i>	<i>M.T</i>	<i>B</i>	193	17.40
<i>14</i>	<i>D.C</i>	<i>B</i>	193	18.40
<b>X±SD</b>			189.29±9.41	17.08±0.97
<b>CV</b>			4.97	5.72
<b>Min</b>			170	15.26
<b>Max</b>			204	18.45

B – backs, G – goalkeepers, P – pivots, W – wings, C – center

Table 3. Statistical analysis - intergroup differences

<b>Indicator</b>	<b>t</b>	<b>p-value</b>
Agility	0.87	.38

## Discussions

As we can see in the tables from above, there were no significant differences calculated between under 18 and under 16 handball junior players in agility ( $p = .38$ ). Although there is a difference between arithmetic means (U16 =  $17.49 \pm 1.52$ ; U18 =  $17.08 \pm 0.97$ ), this is not statistically significant. It is worth mentioning that some of the U18 players were not present. At the moment of the

study, they were selected for training in the national junior team. It is possible that the results of those who missed it will increase the difference.

### **Conclusions**

Through our study, we tried to see if the results that assessed agility differed significantly from one level to another, namely from juniors under 16 to juniors under 18. As we mentioned before, it is well known that agility is influenced by several factors in handball, including: physical characteristics and playing positions.

*The limits of research:* one of the limitations of this presented study is the small number of subjects which have been evaluated. The second limitation of the research is that we did not correlate the results with the game positions. It was necessary to compare the results on the game positions and establish the significant difference between wingers players and backcourt players, between backcourt players and center players and between wingers players and center players.

*Future research directions:* analysis of the motor development specific to the game positions in handball game, of the game profiles and of the differences of agility and explosive power between the players of several levels of juniors.

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