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Evaluation of some morphological determinants of handball players u 19 years and their relationship to the level of explosive force.

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Abstract

The aim of this study was to evaluate the model of some important anthropometric requirements in handball and the explosive force For the hand and legs of handball players u19.
Through a descriptive study of our research sample of 174 players.

The results found that there was a convergence between the youngsters under the age of 19 years for the teams of the West of Algeria in terms of some physical measurements; And the impact of explosive force, and there is an impact of anthropometric measurements in the results of tests of explosive strength in handball players.

1. Introduction

Similar to other team games, the nature of performance in handball depends on the physical, skill and tactical aspect, which requires the necessity of compatibility with special mental abilities of the team members (Hassan, 2006, p. 27). The necessary physical attributes of the handball player have become one of the important aspects. In the daily, weekly, periodic, and annual training plan, the idea of the modern hand is characterized by speed in playing, and skill in technical and planning performance, and the basic rule for the player to reach the features that qualify him for this is the development and development of physical qualities, As it has a direct impact on the level of skill and tactical performance of the player, especially during matches..., and thus the physical fitness of the handball player is linked to the skill and tactical performance of the game, and exercises that develop physical qualities are a constant part of the training program throughout the year (Darwish & Ali, 1998, p 21-22), as handball players are characterized by a set of physical and motor abilities, which are (strength, speed, stamina, agility, coordination, balance, kinetic flexibility and accuracy) (Al-Mashhadi & Al-Jubouri, 2014, p. 151).

The Explosive power is one of the most important components of the power trait that occupies a great place in handball, linking strength and speed. To extract the ball from the opposing player, and all this requires great strength and a very strong muscular effort (Odeh, 2014, p. 119), Not only that, but even the goalkeeper desperately needs this physical characteristic, by jumping to repel balls shot in the upper corners of the goal, or dropped shots, or when long passes in a lightning attack or when he is involved as a player in some offensive situations, which is very important for the goalkeeper's performance, especially for For the two legs and arms (Al-Mashhadi & Al-Jubouri, 2014, p. 159).

There is also no sports activity that is not related to physical characteristics (physical composition) (Hassan, 2006, p 26), as the results of scientific research indicate that there are high correlations between anthropometric measurements and the level of performance in different activities, so short and medium stature is preferred in sports Gymnastics, while tall people are preferred in the sports of basketball and handball... (Shaghati, 2014, p. 153), and heavy bodies are of great importance in sports that require pushing, carrying, or overcoming high external resistances. The long limbs have a very high center of gravity, which helps them to excel in

sports that require jumping, jumping, throwing and swimming (Al-Hazzaa, 2009, p. 128), Similar to handball players who have a body pattern and special physical measurements such as height and weight, which have an important and effective role in the game of handball, the players must be in the category of height, and have a large muscle mass to produce strength in the body as a whole and the arms in particular during the defense process Such as the blocking wall and the confrontation, and attack operations such as shooting and handling, as the dominant pattern of handball players is the muscular pattern, and their heights range between (185-195) cm and their mass weights are between (77-85) kg, and they differ from one center to another (Al-Mashhadi & Al-Jubouri, 2014, p. 151).

Since the idea of measurement in handball expresses the level of levels that players have in the physical, skill and tactical aspects of the game (Ismail & Hassanein, 2001, p. 27-28), it is not possible to infer any progress made based on Programs to evaluate the level of achievement to determine the positive and negative points and to identify the causes, methods and causes of treatment (Darwish & Morsi & Abu Zaid, 2002, p. 354).

and After we discussed some of the previous studies, such as the study of Dr. Harbi Saleem & al. (2018) under the title: Anthropometric measurements and their relationship to the performance of some skills in handball among minors groups, which aimed to identify the relationship of some anthropometric measurements to the performance of some special skills in handball among minors groups (13-15) years, and found the existence of Correlation between the studied anthropometric measurements in themselves and with the basic skills of handball (Salim & Bin Saadeh & Rabouh, 2018, p 122-141).

And the study of Mahor Pasha (2012) under the title: Indicators of the morphological and physical development of handball players (15-17) years; Where it aimed to identify the extent of differences in the morphological and physical development of handball players (15-17) years, and found that the back-back players scored the best results on the level of tests of vertical advancement, horizontal throwing the ball and flexibility and medium to below average results in the speed test (Mahur Pasha, 2012).

From here, and in light of these data that prove some of the importance of evaluating the requirements of achievement and competitive performance, especially the explosive power of handball players for the coach and players, and given our interest in a class under 19 years of age in the field of handball because of its importance in the training ladder directed to building an integrated base of composition in order to reach For the best levels of

performance and achievement, the problem of our study, inspired by the field reality crystallized, Where we went to research one of the aspects and field problems faced by coaches, which is the evaluation of one of the most important physical competitive performance requirements, which is the explosive power of players under 19 years of age for the Western Algerian teams active in the advanced divisions (Second National Division, First, Excellent), which represents the best The difference for this body, in order to identify the extent of convergence and homogeneity between the players in terms of this indicator, and from it setting thresholds (deficiencies, minimum according to the averages) for the level of players that coaches can rely on in classifying their players in the future, our main question was as follows:

- Is the explosive force affected by the physical measurements of handball players under 19 years (17-18) years old in the Algerian western teams active in the advanced divisions (Excellent Division; First Division; Second Division)?

2. Method and Materials

2.1. Participants

Our intended sample included players from a research community that includes players under 19 years for 11 teams from the Algerian West and activists in the advanced sections of the Algerian championship (Excellent Division, First Division, Second Division).

The research sample consisted of 147 players out of 287, so they were distributed as follows:

Table No. 01: Distribution of sample players and the research community:

Sections	Excellent Section	First Section	Second Section
Research sample	33	31	110
Research community	49	46	192
Percentage	67.34%	67.39%	57.79%

2.2. Materials

2.2.1 Research Methodology:

In our study, we have relied on the descriptive approach in our study because it is most appropriate for such research by relying on measurements as a basic method in research, that is, studying the phenomenon as it is related to the change in facts to explore the truth.

2.2.2 Research Areas:

- **Human field:** the research sample included the research sample of 147 players out of 287.
- **Spatial domain:** This study was conducted in western Algeria in the multi-sport halls (Hall... Maghnia, Hall of Colonel Lotfi Tlemcen, Hall... Camp, Hall... Saida, Hall... Oran, Hall... Arzew).
- **Time domain:** The field study was conducted between October and November 2017, during the preparatory phase.

2.2.3 search tools:

A- Important anthropometric measurements (lengths; weight; widths; circumferences).

B - We used the most important tests of explosive force, such as:

- Pushing the medicine ball from the front of the chest to the farthest distance (measuring the muscles of the arms).
- long jump of the tibia (legs muscles); Jumping up with the feet using the magnetic board or using the Elacon belt (measuring the muscles of the legs) (Shaghati, 2014, p. 299).

2.2.4 Scientific basis for the tests and measurements used:

Test stability:

(Melhem 2005) believes that stability means stability. If you repeated the measurements of one individual, it would show some stability Al-Fartousi; Al-Husseini & Al-Karizi, 2015, p. 218), and in order to achieve the scientific foundations of the approved tests and measurements; We used the test-retest method, where the idea of this method is to perform the test on a group of individuals and then repeat the same test on the same individuals after a period of time (Abdel-Majid, 1998, p. 82), and they were applied to a sample From the research community consisting of 36 players - we mentioned this in the research community and sample -.

When we obtained the results, we studied the correlation using the “Pearson” correlation coefficient, which is the most common (Al-Fartousi,

Sadiq Jaafar Al-Husseini, Ali Mutair Al-Karizi, 2015, p. 207), where its value is between (0-1) (Al-Kaf). , 2014, p. 56).

Test honesty: where honesty is considered one of the most important good tests, the honest test is the one that succeeds to measure what it was designed for.).

To get the validity of the test, we calculated the validity coefficient.

Test validity = test reliability coefficient

The results obtained were as follows:

Table No. 02:. Morphological measurements

Measurement	stability	honesty	appreciation	Measurement	stability	honesty	appreciation
body length	0.99	0.99	excellent	shoulder width	0.99	0.99	excellent
stump length	0.99	0.99	excellent	pelvic width	0.99	0.99	excellent
arm length	1	1	excellent	hand width	0.99	0.99	excellent
lower limbs	0.99	0.99	excellent	Shoulder circumference	0.99	0.99	excellent
hand length	0.99	0.99	excellent	pelvic circumference	0.99	0.99	excellent
Arm width	0.99	0.99	excellent	weight	1	1	excellent

Table No. 03:. explosive force

Measurement	stability	honesty	appreciation
vertical jump	0 .98	0 .98	excellent
cross jump	0 .98	0 .98	excellent
medicine ball standing	0.99	0.99	excellent
Seated medicine ball	0.99	0.99	excellent

2.3. Statistical Analysis:

We have relied on a number of statistical methods that are appropriate for our purposes: they are as follows:

A- Fisher's analysis of variance "P" test: (Abdel-Majid, 1998, p. 89),

B- P homogeneity.

C- Spearman for correlation.

D- Student's test.

3. Result :

3.1 Presentation, analysis and discussion of the results of explosive force tests:

Table No. 04: shows the comparison between the difference between each sample separately and the three samples in terms of explosive force tests.

Arms explosive force test				Lower limb explosive force test				N	The Indications / the team		
medicine ball standing		medicine ball sitting		horizontal jump		Sargent test					
^2EC	M	^2EC	M	^2EC	M	^2EC	M				
12555.8	784.41	4568.38	584.41	818.01	231.47	68.76	44.52	17	saida		Excellent Section
6622.91	783.12	3989.58	571.87	747.39	221.06	49.59	42.43	16	oran		
0.03		0.54		1.06		0.78			calc	T Student	
2.03		2.03		2.03		2.03		.05	tab		
31		31		31		31			Deg-fr		
no significance		no significance		no significance		no significanc			Indic		
9278.09	799.33	2380.95	556.66	849.52	219.33	26.38	42.56	15	meghnia		First Section
5158.33	788.75	3473.33	562.5	815.72	216.56	29.42	42.31	16	Ain tadles		
0.34		0.30-		0.39		0.18			calc	T Student	
2.04		2.04		2.04		2.04		95 %	tab		
29		29		29		29			Deg-fr		
no significance		no significance		no significance		no significanc			Indic		
8940.39	807.56	5272	574	441.66	223.75	45.85	45.62	16	tlemcen		Second Section
6371.97	774.72	5679.11	553.94	972.58	222.33	45.41	38.33	18	mascara		
8143.12	781.06	3012.91	555.62	523.33	215	37.42	43.31	16	sfizef		
3606.66	790.66	3023.09	596.33	558.80	216.33	31.38	41.66	15	Oued sli		
6668.13	777.14	7029	578.21	601.80	215.5	34.02	41.21	14	ghelizan		
3193.22	772.81	6312.39	558.43	595	218.75	56.29	41.18	16	Es–senia		
9454.28	801	4509.52	578.33	480.69	227.53	47.26	43.53	15	mesreguine		
0.44		0.82		0.57		2.08			calc	analysis variance	
2.18		2.18		2.18		2.18			tab		
(10³6)		(10³6)		(10³6)		(10³6)			Deg-fr		
no significance		no significance		no significance		no significanc			Indic		
9382.85	783.78	4194.79	578.33	787.25	226.42	58.75	43.51	33	Excellent		Variation between sections
6937.84	793.87	2856.55	559.67	806.29	217.90	27.05	42.48	31	First Section		
6419.35	786.20	4537.34	569.95	590.77	219.97	45.36	42.06	110	Second Section		
0.13		0.66		1.03		0.60			calc	analysis variance	
3.04		3.04		3.04		3.04			tab		
(171¹2)		(171¹2)		(171¹2)		(171¹2)			Deg-fr		
no significance		no significance		no significance		no significanc			Indic		

• in terms of the results of the explosive force tests (lower members; arms). There were no statistically significant differences between the juniors of the sample teams, where in the excellent and first sections, the calculated t in all measurements was smaller than the tabular T. And in the junior division of the second division and among the teams of the three divisions, the calculated F-Fisher was smaller than the tabular value.

3-2 Presentation, analysis and discussion of the correlation between the results of important anthropometric measurements for players:

Table No. 05: Shows the relationship and correlation between the most important physical requirements for handball players.

A

	body length	stump length	arm length	lower limbs	hand length	Arm width	shoulder width	pelvic width	Shoulder circumference	Shoulder circumference	pelvic circumference
body length	1										
stump length	0,79	1									
arm length	0,84	0,81	1								
lower limbs	0,73	0,75	0,69	1							
hand length	0,87	0,82	0,82	0,75	1						
Arm width	0,92	0,77	0,84	0,70	0,85	1					
shoulder width	0,81	0,79	0,83	0,71	0,75	0,77	1				
pelvic width	0,80	0,80	0,80	0,80	0,76	0,76	0,81	1			
hand width	0,31	0,29	0,39	0,25	0,32	0,30	0,30	0,34	1		
Shoulder circumference	0,79	0,74	0,73	0,72	0,77	0,78	0,76	0,81	0,33	1	
pelvic circumferenc	0,54	0,54	0,50	0,56	0,53	0,53	0,51	0,53	0,197	0,56	1
weight	0,77	0,77	0,68	0,78	0,76	0,74	0,70	0,79	0,29	0,83	0,59

Analysis and discussion of the results:

By analyzing the results of Table No. 05, which studies the extent of the correlation between the elements of the studied physical requirements, we reached the following results:

*** Regarding heights:** there is a positive correlation between all the elements of the studied body measurements, where we notice an integration among them, where each length is affected by and affects the other lengths, for example, the greater the length of the body, the greater the length of the leg, torso, arm and hand, meaning that those who have a taller stature are the ones who have Greater lengths, where the length of the body clearly affects the other lengths, not only this, the effect of all lengths appeared and affected each other.

*** Regarding the widths:** similar to the lengths, the results of the correlations showed clear positive relationships between the shows, where each show is affected by the other shows and affects them, for example, the greater the width of the pelvis, this clearly affects the increase in the width between the shoulders and the width by extending the arms and is affected by them.

*** For circumferences:** the greater the circumference of the pelvis, the greater the circumference of the shoulders, and vice versa, and this correlation appears clearly through the results.

*** The relationship between the measurements:** it was found that there is a positive correlation for all the elements with the length of the body, as the greater the length of the body, the greater the lengths, widths and circumferences of the components of body measurements, in addition to the positive effect on body weight. It did not affect other measurements.

3-3 Presentation and analysis of the relationship and correlation between the results of explosive force tests:

Analysis and discussion of the results:

The results of the correlations between the physical components were highlighted in Table No. 06 showing a clear positive correlation between the results of the explosive force tests of the upper and lower organs. The better results the player achieved in the vertical jump test, the better his results were in transverse jumping and pushing the medicine ball than sitting and standing and vice versa.

Table No. 06: Shows the relationship and correlation between the results of explosive force tests.

	Sargent test	horizontal jump	medicine ball standing	medicine ball sitting
Sargent test	1			
horizontal jump	0,8009	1		
medicine ball standing	0,8774	0,8099427	1	
medicine ball sitting	0,8457	0,8100084	0,902583	1

3-4 Presentation, analysis of the relationship and correlation between anthropometric measurements and the results of explosive force tests:

Table No. 07: shows the relationship and correlation between anthropometric measurements and the results of explosive force tests.

	body length	stump length	arm length	lower limbs	hand length	Arm width	shoulder width	pelvic width	Shoulder circumference	pelvic circumference	weight
Sargent test	0,79	0,82	0,76	0,78	0,81	0,79	0,78	0,78	0,88	0,57	0,87
horizontal jump	0,82	0,72	0,66	0,75	0,72	0,76	0,73	0,74	0,78	0,53	0,79
medicine ball standing	0,85	0,79	0,78	0,74	0,81	0,84	0,78	0,79	0,86	0,58	0,85
medicine ball sitting	0,83	0,75	0,73	0,81	0,78	0,81	0,77	0,79	0,83	0,55	0,83

By analyzing the results of Table No. 07, it was found that:

- **Explosive force:** It is one of the physical characteristics most affected by anthropometric measurements in the juniors of the research sample, where high positive correlations appeared between anthropometric measurements and the results of explosive force tests of the upper and lower organs.

3-5 Discuss the results with hypotheses:

3-5-1 Discussing the results with the sub-hypotheses:

A- The first sub-hypothesis: By presenting and analyzing the results of the first table, we came to believe this hypothesis which states that there is a convergence between the players in terms of the results of the explosive power tests, as we did not find statistically significant differences in any of the explosive power tests.

B- The second sub-hypothesis: Similar to the previous hypothesis, we came to believe the second hypothesis which states that there is a correlation between the results of important anthropometric measurements among the players, where it was found that there is a positive correlation for all elements with body length, where the greater the length of the body, the greater the lengths, widths and circumferences of the components of body measurements, in addition to the effect Positive in body weight, as it showed positive correlations between all the elements of body measurements except for the width of the open hand, which was not affected and did not affect the other measurements.

C- The third sub-hypothesis: By presenting and analyzing the results of Table No. 03, we have come to believe this hypothesis which states that there are correlations between the results of the players' explosive power tests.

D- Fourth sub-hypothesis: By presenting and analyzing the results of Table No. 04, we have come to believe this hypothesis which states that there is a clear effect of anthropometric measurements on the results of explosive force tests for handball players.

3-5-2 Discussing the results with the main hypothesis:

After validating the four sub-hypotheses, we reached to confirm the general hypothesis that the results of explosive force tests are affected by anthropometric measurements of handball players under 19 (17-18) years old in the Western Algerian teams active in the advanced divisions (Excellent Division; First Division; Second Division).

4 Conclusions and general conclusion:

- There is convergence between the juniors of the under-19 category of the Western Algerian teams active in the advanced divisions in terms of some anthropometric competitive performance requirements; explosive force.
- The affinity between the juniors and these requirements reflects the great interest that the trainers of this class give to this type of tests.
- The greater the length of the body, the greater the length, width, circumference, and weight of the body.

There are positive correlations between most of the anthropometric components.

- There are correlations between the results of important explosive power tests in players.
- There is an effect of anthropometric measurements on the results of explosive force tests for handball players.

- The need for players of all positions for explosive force of all kinds on the one hand and their suitability to important physical measurements on the other hand contributed to increasing the value of the link between the requirements.
- The results highlighted some indicators and figures that coaches can rely on in choosing their players and directing them to specialize through their evaluation and comparison of the results with the results of our research.

5 recommendations:

- Benefiting from the research results reached by resorting to them as a criterion for selecting and directing young people.
- We hope to apply these tests to a wide field in the discovery and selection of handball players with no side.
- Relying on and expanding the results obtained in our research in order to build standard levels in each indicator of performance requirements to facilitate the work of coaches in the field in evaluating their players.
- Continuous training of trainers in this field to keep pace with developments in the field of measurement and evaluation on the one hand and the importance of measurement in the correct guidance of the athlete for the appropriate specialization and saving time on the other hand.
- We recommend researchers to search more in this category, because of its importance in sports training, with the application of our proposal with different samples and other variables to prove it more through continuous experimentation based on scientific foundations.

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