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The physical profile of high-level handball players in Algeria according to playing positions.

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Abstract

The Object of the study aims to identify the physical profile of high-level handball players in Algeria, according to playing positions for this purpose, we used the method descriptive On a sample composed of of 44 handball players from the premier division Chosen as a random stratified manner, and for data collection, we used a tool a set of physical tests as a research tool After collecting the results and having treated them statistically, we conclude the physical profile of handball players, the high level varies according to the playing positions.On this basis, the study recommended the derived profile serves as a database for identifying the characteristics of each position physically and comparing them - in the future - with international standards in order to assess the local players' level and plan specialized training.

1. Introduction

Playing handball imposes on players an intermittent high-intensity workload that requires a combination of high aerobic and anaerobic capacities. Apart from technical and tactical skills, the physical preparedness of handball players is also extremely important (Kuchenbecker &Zieschang, 1992).

Handball rules were modified in 2000 and 2016 and playing conditions adapted (IHF, 2016), which has increased the speed of the game (e.g., quick throw-off, goalkeeper as court player), making sport more marketable, enhancing media coverage, and making it more appealing for the viewer (Marczinka, Z.; Gál, A,2018). As a result of these rules changes, handball has increased in terms of dynamics, velocity, and intensity in the past years (Manchado & al ., 2007). This is especially true for top-level handball Knowledge of the demands of the game is essential for the design of handball-specific training drills. Detailed information on the movements, like the distances covered by players, their movement velocities during a game among the analysis of vertical movements like jumps, shots, or blocking provides comprehensive assessment of the competition demands and assists in developing specific training regimes (Manchado& al,2013). programs should be individualized with respect to playing positions and related to specificcompetition on-court demands (Di Salvo, & al, 2007).

In handball there are five well differentiated playing positions: 1 goalkeeper: in control of stopping the ball; he may not leave the six-meter area with the ball in his hand, but may touch it outside the area if it is passed by a teammate; 2) central: the axis of the team and the extension of the coach on the field; he is the one who commands in attack and defense, marks the plays, places the players and indicates where the static attacks should start from; 3) wing: are those who break the closed defenses from the goal area and assist, on most occasions, to the ends; 4) pivot: is responsible for getting into the defensive wall and open holes where possible, and 5) back: are those who begin the moves of static attack, moving the defense and throwing to goal, if there is space3(IHF, 2018).

Likewise, it is important to note that the playing position, the game phase (offense or defense), as well as the team's playing style can lead to big differences in each player's physical demands. Therefore, the physical load cannot only be determined generally, but according to each player's specific position on the court both in offense and defense (Michalsik &al2013)All

this information could help coaches to better individualize training loads and thereby improve performance (Luteberget&al2017)

Many researchers have dealt with this topic because of its importance, and we mention from these studies the study of Sabira Mahor Pasha (2012) at the University of Algiers - entitled Indicators of the morphological and physical development of young handball players by playing centers and reached the typical feature of morphological and physical development of handball players (15-17 years) by playing positions. As well as a study (Chittibabu, 2014) in India entitled: comparison of repeated sprint ability and fatigue index among male handball players with respect to different playing position The results showed a significant difference between male handball players in different playing positions. The sum of speed and fatigue performance times are best for wings and worst for goalkeepers.and the study of (Zapartidis&ah,2009) which concluded that The profile of young handball players is formed by physical and morphological determinants specific to playing positions, in fact significant differences were revealed between young handball players in different playing positions in all measured variables, except flexibility.

And the difference in the nature and duties of each of the play positions in the effectiveness of handball requires familiarity with these differences and duties by coaches and trying to improve the physical and skill level and the lack of scientific knowledge and interest among those in charge of the training process with the difference in the level of physical fitness between the different play positions and its impact, the research problem has emerged, as identifying these differences can help coaches to improve the level of players, which are The main pillar in the technique and tactic of the team, and this encouraged us to study the differences in these elements in order to reach results that serve the effectiveness of handball and in the light of the above, the researcher proposed this study, which is problematic as follows:

What is the physical profile of high-level handball players according to playing positions?

1. Method and Materials

Based on the study's problem, which seeks to investigate the physical characteristics of elite handball players according to their playing positions, the descriptive method is the most suitable approach for this study.

After making sure of the sincerity and stability of the study tools, we

conducted the study on a sample consisting of (44) players from the excellent handball section, where the test was conducted on the sample members and then the results were recorded in their card, and then the results were examined and classified in the SPSS system tables.

2.1. Participants

The research population consists of male elite handball players in the eastern region for the sports season of 2014/2015 in the country, which comprises six teams.

The research sample consisted of 3 teams in the excellent division of the Eastern region for the sports season 2013/2014 in the country, representing 50% of the research population.

Table 2: Distribution of the research sample by playing position

CLUBS		Number of players according to playing positions					total
		GOALKEEPERS	BACKS	CENTERS	PIVOT	WINGS	
1	CRBM	02	03	03	04	04	16
2	CCL	03	04	02	01	05	15
3	MBT	03	02	01	04	03	13
	TOTAL	08	09	06	09	12	44
	The ratio %	10.10	520.4	313.6	520.4	27.27 00	1

2.2. Materials

For the purpose of data collection, the researcher relied on a set of physical tests:

-30 meter speed test using the Cellule Photoelectrique device

-Medicine ball throw test 2 kg from a seated position

-CMJ vertical jump test using Optojump

-T-test to measure agility using the Cellule Photoelectrique device

-15-30 IFT test measuring the maximum aerobic speed

2.1. esign and Procedure

After making sure of the sincerity and stability of the study tools, we conducted the study on a sample consisting of (44) players from the excellent handball section, where the test was conducted on the sample members and then the results were recorded in their card, and then the results were examined and classified in the SPSS system tables.

Statistical Analysis

The researcher analyzed using the statistical package for social sciences SPSS 20 to identify the following statistical values:

- Arithmetic mean.
- Standard deviation.
- Coefficient of variation.
- Single variance analysis (ANOVA).
- TUKEY Honest Difference Test.

2. Results

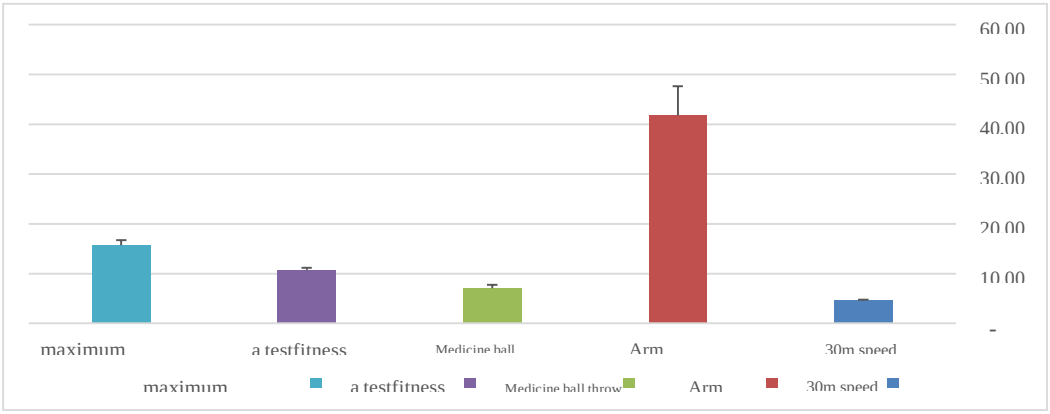
Displaying the results of the goalkeeper's physical tests

Table 3 Shows the results of the goalkeepers' physical tests

the test / Statistics	30 m speed	CMJ	Throw the ball Medical	T test	IFT
Mean	4,59	41,73	7,09	0,741	15,69
standard deviation	0,21	5,91	0,69	0,43	1,03
maximum value	4,91	50,20	8,20	1,191	17,50
minimum value	4,38	35,10	6,10	9,96	14,00
coefficient of difference	4,47	14,15	9,79	4,04	6,58

Figure 1: Shows the results of the goalkeeper's physical tests

Through Table No. (3) and Figure No. (1), which represent the results of the



physical tests for goalkeepers, we note the following

-The arithmetic mean for the 31-meter speed test was 4.59 seconds, with a deviation of ± 0.21 seconds, with a maximum value of 4.91 seconds and a minimum value of 4.38 seconds, with a coefficient of difference of 4.47%, which indicates the great homogeneity between the elements of the research sample.

-The arithmetic mean for the vertical stand test was 41.73 cm, with a deviation of ± 5.91 cm, with a maximum value of 50.20 cm and a minimum value of 35.10 cm, with a coefficient of difference of 14.15%, which indicates the existence of moderate homogeneity among the elements of the research sample.- The arithmetic mean of the medical ball throwing test was 7.09 meters, with a deviation of ± 0.69 meters, with a maximum value of 8.20 meters and a minimum value of 6.10 meters, with a coefficient of difference of 9.79%, which indicates the great homogeneity between the elements of the research sample.

- The arithmetic mean of the T test for agility was 01.14 seconds, with a deviation of ± 1.43 seconds, with a maximum value of 0.00 seconds and a minimum value

of 6.,. Second, with a coefficient of difference of 4.14%, which indicates the great homogeneity between the elements of the research sample.

- The arithmetic mean of the maximum airspeed was .01.6 km/h with a deviation of ± 0.13 km/h with a maximum value of 01.11 km / h and a

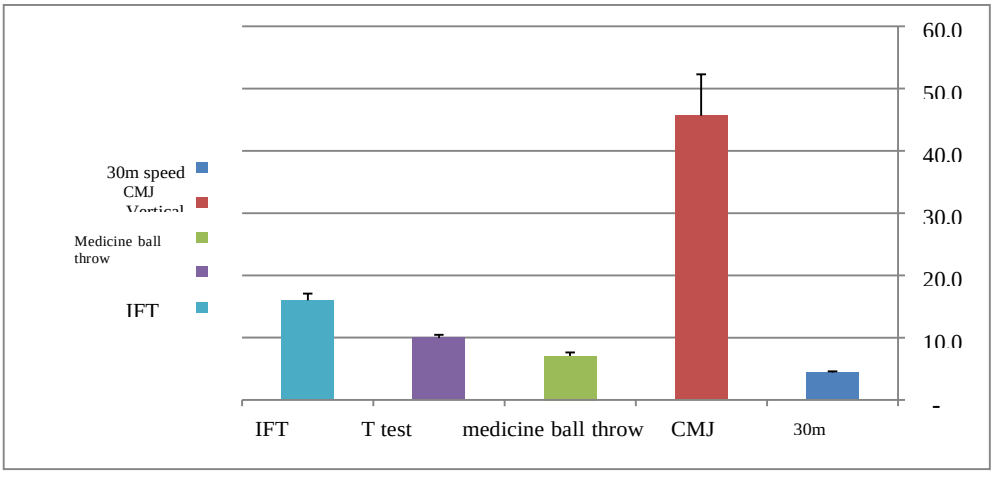
minimum value of 04.11 km / h with a coefficient of difference of 6.12%, which indicates the great homogeneity between the elements of the research sample.

Display of the results of the physical examinations of the wings

Table: 4 represents the results of the physical examinations of the wards

the test / Statistics	30m speed	CMJ	Throw the ball Medical	T test	IFT
Mean	4,45	45,68	7,06	10,02	16,04
standard deviation	0,16	6,65	0,57	0,45	1,08
maximum value	4,70	56, 80	7,80	10 ,77	17,5
minimum value	4,25	31, 00	5,70	9,09	014,5
coefficient of difference	3,50	14, 56	8,05	4,50	6,71

Figure No. (2) represents the results of the physical tests of the wings



Through Table No. (1) and Figure No. (8), which represent the results of the physical examinations of the wards, we note the following:

- The arithmetic mean for the 31-meter speed test was 4.41 seconds, with a deviation of ± 1.06 seconds, with a maximum value of 4.11 seconds and a minimum value of 4.81 seconds, with a coefficient of difference of

3.11%, which indicates the great homogeneity between the elements of the research sample.

- The arithmetic mean for the vertical stand test was 41.62 cm, with a deviation of 6.61 ± 6.6 cm, with a maximum value of 16.21 cm and a minimum value of 30.11 cm, with a coefficient of difference of 04.16%, which indicates the existence of moderate homogeneity among the elements of the research sample.
- The arithmetic mean of the medical ball throwing test was 1.16 meters, with a deviation of ± 1.11 meters, with a maximum value of 1.21 meters and a minimum

value of 1.11 meters, with a coefficient of difference of 2.11%, which indicates the great homogeneity between the elements of the research sample.

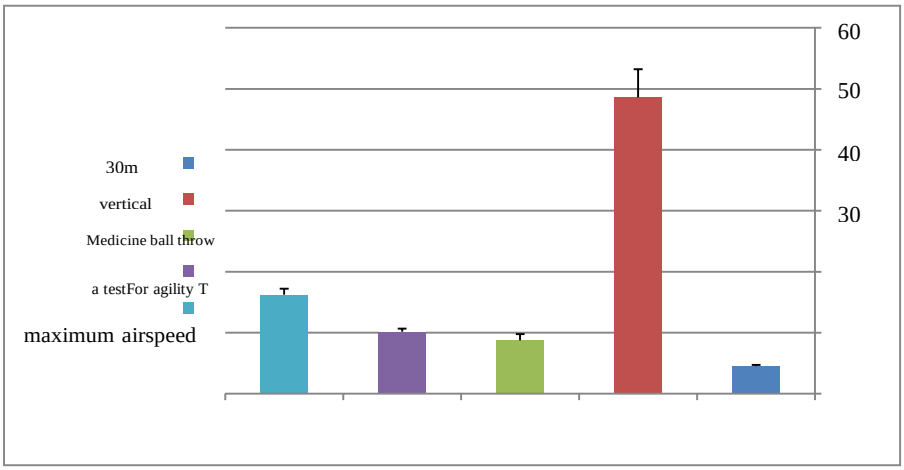
- The arithmetic mean of the T test for agility was 01.18 seconds, with a deviation of ± 1.41 seconds, with a maximum value of 01.11 seconds and a minimum value of 0.1. Second, with a coefficient of difference of 4.11%, which indicates the great homogeneity between the elements of the research sample.
- The arithmetic mean of the maximum airspeed was 06.14 km/h with a deviation of ± 0.12 km/h with a maximum value of 01.11 km / h and a minimum value of 04.11 km / h with a coefficient of difference of 6.10%, which indicates the great homogeneity between the elements of the research sample.

3.1.3 View the results of the physical exams for the backs

Table 5: Represents the results of the physical examinations for the backs

the test / Statistics	30 m speed	CMJ	Throw the ball Medical	T test	IFT
Mean	4,54	48,59	8,76	10,17	16,22
standard deviation	0,22	4,62	1,02	0,49	0,97
maximum value	4,99	54,10	9,90	10,99	17,50
minimum value	4,20	38,70	7,20	9,63	14,50
coefficient of difference	4,54	9,51	8,76	10,17	5,99

Figure 3: Illustrating the results of the physical exams for the backs



Through Table No. (6) and Figure No. (3), which are representative of the results of the physical examinations for the hinds, we note the following:

The arithmetic mean for the 31-meter speed test was 4.14 seconds, with a deviation of ± 1.88 seconds, with a maximum value of ..,4 seconds and a minimum value of 4.81 seconds, with a coefficient of difference of 4.14%, which indicates the great homogeneity between the elements of the research sample. .
The arithmetic mean for the vertical stand test was .42.1 cm, with a deviation of ± 4.68 cm, with a maximum value of 14.01 cm and a minimum value of 32.11 cm with a coefficient of difference of 10. %, which indicates a large homogeneity among the elements ofthe research sample.
The arithmetic mean for the medical ball throwing test was 2.16 meters with a deviation of ± 0.18 meters with a maximum value of 1.,. meters and a minimum value of 1.81 meters with a coefficient of difference of 2.16%, which indicates the great homogeneity between the elements of the research sample.
The arithmetic mean of the T test for agility was 01.01 seconds, with a

deviation of ±.1.4 seconds, with a maximum value of ..01 seconds and a minimum value of 63. Second, with a coefficient of difference of 01.01%, which indicates the average homogeneity between the elements of the research sample.

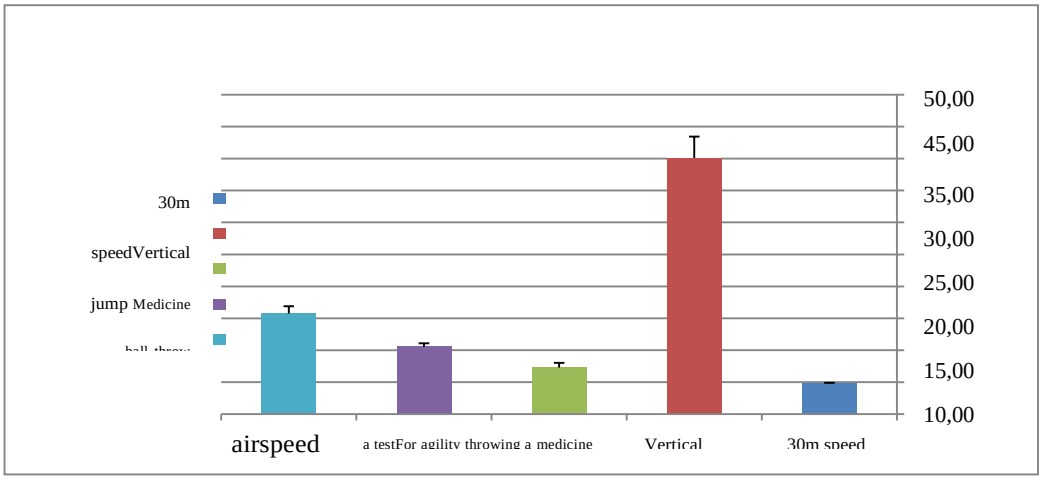
The arithmetic mean of the maximum airspeed was 06.88 km/h with a deviation of ± 1.1 km/h with a maximum value of 01.11 km / h and a minimum value of 04.11 km / h with a coefficient of difference of ..,1%, which indicates the great homogeneity between the elements of the research sample.

Presentation of the results of the physical examinations of the two pivots

Table 6: Representing the results of the physical tests for the two pivot

the test / Statistics	30 m speed	CMJ	Throw the ball Medical	T test	IFT
Mean	54,4	68,54	06,7	02,01	416,0
standard deviation	60,1	65,6	57,0	45,0	81,0
maximum value	04,7	80,65	80,7	77,01	017,5
minimum value	54,2	00,13	70,5	09,9	014,5
coefficient of difference	e 03,5	56,41	05,8	50,4	16,7

Figure 4: Shows the results of physical exams for the two axials



Through Table No. (1) and Figure No. (4), which represent the results of the physical tests for the two axes, we note the following:

The arithmetic mean for the 31-meter speed test was 4.1 seconds, with a deviation of ± 1.04 seconds, with a maximum value of 1.10 seconds and a minimum value of 4.12 seconds, with a coefficient of difference of 8.2%, which indicates the great homogeneity between the elements of the sample. Search

- The arithmetic mean for the vertical stand test was 41.00 cm, with a deviation of ± 3.31 cm, with a maximum value of 46.21 cm, and a minimum value of 1.31 cm, with a coefficient of difference of 2.34%, which indicates a great homogeneity among the elements of the research sample.
- The arithmetic mean for the medical ball throwing test was 1.38 meters, with a deviation of ± 1.18 meters, with a maximum value of 2.11 meters and a minimum value of 6.31 meters, with a coefficient of difference of 21.0. %, which indicates the great homogeneity between the elements of the research sample.

- The arithmetic mean of the T test for agility was 01.01 seconds, with a deviation of ±.1.4 seconds, with a maximum value of ..01 seconds and a minimum value of 63. Secondly, with a difference parameter of 01.01%, which indicates the average homogeneity between the elements of the research sample.

- The arithmetic mean of the maximum airspeed was 01.12 km/h with a deviation of ± 0.08 km/h with a maximum value of 01.11 km / h and a minimum value of 04.11 km / h with a coefficient of difference of 1.00%, which indicates the great homogeneity between the elements of the research sample.

5.1.5 Display the results of physical exams to centals

Table 7: Represented central physical tests results

the test / Statistics	30m speed	CMJ	Throw the ball Medical	T test	IFT
Mean	**4,48**	**5,674**	**7,58**	**10,10**	**16,42**
standard deviation	**0,17**	**6,48**	**0,58**	**0,48**	**0,58**
maximum value	**4,70**	**1,605**	**8,30**	**10,90**	**17,00**
minimum value	**4,31**	**5,703**	**6,90**	**9,61**	**15,50**
coefficient of difference	**3,91**	**4,181**	**7,62**	**4,77**	**3,56**

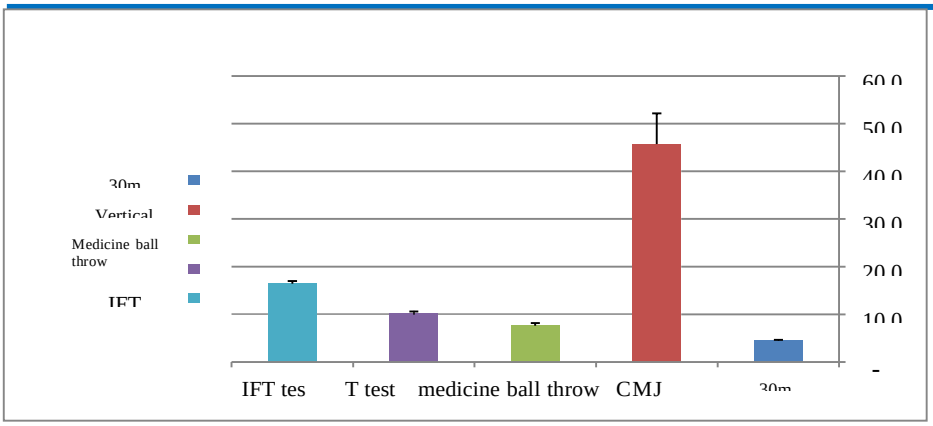


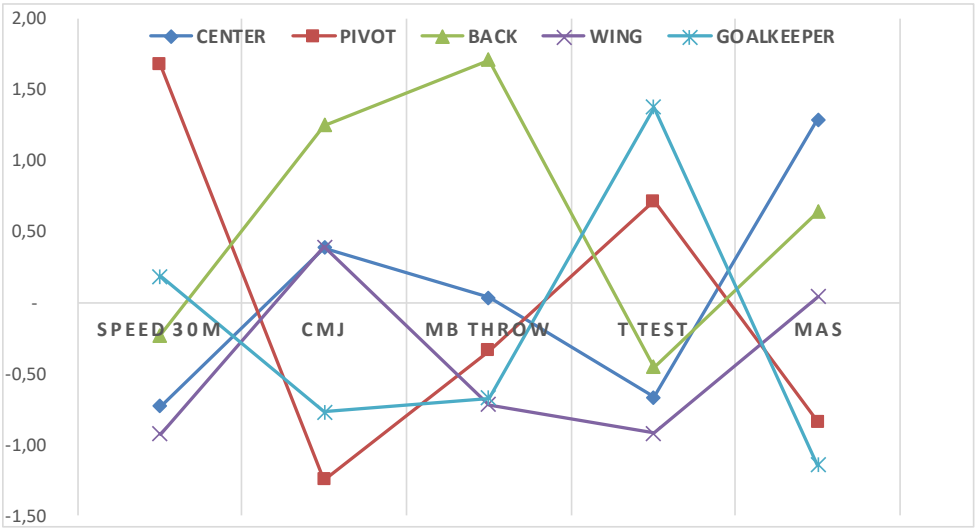
Figure 5: Shows the results of the centrals s' physical tests

Through Table No. (2) and Figure No. (1), which represent the results of the distributors' physical exams, we note the following:

- The arithmetic mean for the 31-meter speed test was 4.42 seconds, with a deviation of ± 1.01 seconds, with a maximum value of 4.11 seconds and a minimum value of 4.30 seconds, with a coefficient of difference of 0.3%, which indicates the great homogeneity between the elements of the research sample. .
- The arithmetic mean for the vertical stand test was 41.61 cm, with a deviation of 6.42 ± 6.42 cm, with a maximum value of 10.61 cm and a minimum value of 31.11 cm, with a coefficient of difference of 04.02%, which indicates the existence of moderate homogeneity among the elements of the research sample.
- The arithmetic mean for the medical ball throwing test was 1.12 meters, with a deviation of ± 1.12 meters, with a maximum value of 2.31 meters and a minimum value of 1.6 meters, with a coefficient of difference of 1.68%, which indicates the great homogeneity between the elements of the research sample. .
- The arithmetic mean of the T test for agility was 01.01 seconds, with a deviation of ± 1.42 seconds, with a maximum value of 1.01 seconds and a minimum value of 60.0. Second, with a coefficient of difference of 4.77%, which indicates the great homogeneity between the elements of the research sample.
- The arithmetic mean of the maximum airspeed was 06.48 km/h with a deviation of ± 1.12 km/h with a maximum value of

01.11 km / h and a minimum value of 01.11 km / h with a coefficient of difference of 3.56%, which indicates the great homogeneity between the elements of the research sample.

3.3 general profile of the research sample according to the results of the physical tests



Playing positions / Tests		30m	T test	Throw a good ball	CMJ	IFT
goalkeepers	paTairinthmetic mean	**4,59**	**10,74**	**90, 7**	**41,73**	**15,69**
	noStawndard character	**0,21**	**0,43**	**96, 0**	**5,91**	**1,03**
wings	paTairinthmetic mean	**4,45**	**10,02**	**60, 7**	**45,68**	**16,04**
	noStawndard character	**0,16**	**0,45**	**75, 0**	**6,65**	**1,08**
backhands	paTairinthmetic mean	**4,54**	**10,17**	**67, 8**	**48,59**	**16,22**
	noStawndard character	**0,22**	**0,49**	**20, 1**	**4,62**	**0,97**
pivots	paTairinthmetic mean	**4,79**	**10,53**	**23, 7**	**40,11**	**15,78**
	noStawndard character	**0,14**	**0,58**	**27, 0**	**3,35**	**1,12**
Distributors	paTairinthmetic mean	**4,48**	**10,10**	**85, 7**	**45,67**	**16,42**
	noStawndard character	**0,17**	**0,48**	**85, 0**	**6,48**	**0,58**

Figure 6 shows the general profile of the research sample according to the results of the physical tests

3. Discussion

From Figure No 6 the features of the research sample elements are clear, as: The goalkeeper players were distinguished by average results in the speed test, weak in the vertical jump test, and the weakest in the agility and maximum air speed test.

The wing players achieved the best results in speed, above average results in the vertical jump, the weakest results in throwing the medicine ball, the best results in the agility test, and average results in the maximum airspeed test, and this is consistent with the study of Elias and others, where they found that the wing players are The fastest, followed by the back center, and the researcher attributes this to the specificity of the center, which is characterized by counterattacks, which requires the characteristic of speed, and twice the results were recorded among the players of the pivot center, because of the characteristics of this center, characterized by lack of movement and dependence on strength. .

The back-to-back players achieved less than average results in the speed test, the best results in the vertical jump and throwing the medicine ball, and good results in the agility test at the maximum aerobic speed. The backs showed the best results in throwing the ball and also showed the largest muscle mass compared to the rest of the plying positions.

4. Conclusion

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In light of the results of the study within the limits of the sample and within the framework of the statistical treatment used, the researcher reached the general physical profile of the high-level handball players, after measuring the most specific elements of physical fitness in the performance of handball and comparing

between the different playing position. The profile is considered as a database of In order to determine the characteristics of each physical center and compare it-in the future - with international standards in order to stand on the level of local players and plan specialized training.

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