



## ANTHROPOMETRIC FEATURES AND BALANCE AMONG ELITE HANDBALL PLAYERS

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### Abstract

**Purpose:** The aim of this study was to investigate the balance and body fat values of a team playing in the Turkish Handball Super League and to compare them with the international values and also to contribute the national norm to develop for the handball players.

**Methods:** Male players from a team playing in the Turkish Handball Super League as experimental group (n=12) and university students as control group (n=12) participated in the study. The relationship among static balance, body fat percentage and some anthropometric parameters of subjects whose average age was  $\bar{x} = 29.3 \pm 4.1$  years for experimental group and  $\bar{x} = 23.2 \pm 2.1$  years for control group was investigated. The statistical significance was accepted as  $p < 0.05$ .

**Results:** The sport age, height and weight values of the handball players were significantly higher than the values of university students. The body fat percentage of handball players ( $13.3 \pm 3.1$ ) was also higher than of the university students ( $12.2 \pm 2.1$ ). As the balance values of handball players ( $8.2 \pm 3.1$ ) were better than the values of control group ( $8.9 \pm 7.5$ ) on the right foot, the values of control group ( $6.0 \pm 2.6$ ) were better than of elite handball players ( $7.4 \pm 2.3$ ) on the left foot.

**Conclusion:** As a result, even if it could be found some differences between the elite handball players and the control group among the static balance values, body fat percentage and anthropometric parameters, these differences weren't statistically significant. The physical and anthropometric features of elite handball players showed similarities with the other international players.

**Key Words:** Handball, static balance, body fat percentage.

### Introduction

Handball is a sport which is rapidly gaining more and more popularity and this is inevitable. However,

European and North African countries. Team handball, combining aspects of basketball, soccer and baseball, is one of the most popular sport in the world. The game is unique, with a rapid and physical yet simultaneously skillful and strategic style of play (Sporis, Vuleta, Vuleta, & Milanovic, 2010). There is a paucity of research on the physiological,

physical, and anthropometric profiles of elite and sub-elite handball players. Profiling can be valuable means of identifying talent, strengths and weaknesses, assigning player positions, and helping in the optimal design of strength and conditioning programmes (Chaouachi et al., 2009). It will not be a wrong comment when the handball is compared

with the other sport branches that the reasons of the insufficient studies about elite handball players are seen as the narrowness of the area where it is played and it has been commonly playing recently. Handball is a complex sport branch requiring strength, resistance and speed to be successful. Balance is, like the other sport branches, one of the most important measurable values of coordination in handball. Even if handball is seen as an aerobic activity, the explosive activities

Americans are accustomed to watching such sports as football, basketball, soccer and baseball, handball is a popular sport especially in

consisting of speed, coordination and agility are crucial for success. Handball players have to have lower body fat percentages in order to use aerobic and anaerobic capacity effectively in the game. The lower body fat percentage can be taught as a sub-component of power because it develops the relative muscular strength and also as a sub-component of speed and agility because it affects the active muscle mass ratio. The aim of this study is to investigate the balance and body fat values of a team playing in the Turkish Handball Super League and to compare them with the international values and also to contribute the national norm to develop for the handball players.

### Method

This study was performed on the Çankaya Belediyespor male players (n=12) playing in the Turkish Handball Super League and a control group consisting of the male university students from School of Physical Education and Sport (n=12) were included in the study to compare the data. The subjects firstly were informed about the tests and signed the voluntary participation form. Flamingo balance test was used to measure the balance. The subjects were asked to stand

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on the beam (50cm long, 5cm high and 3cm wide) on one leg like a flamingo for 60 seconds and it was applied for each leg. The number of attempts after the falls during 60 seconds was accepted as the balance score. In the first 30 seconds of test, if the subject had more than 15 attempts, the test was terminated and a core of zero (0) was given. The body fat percentage was found by using Sloan-Weir formula ( $BD=1.1043 -$

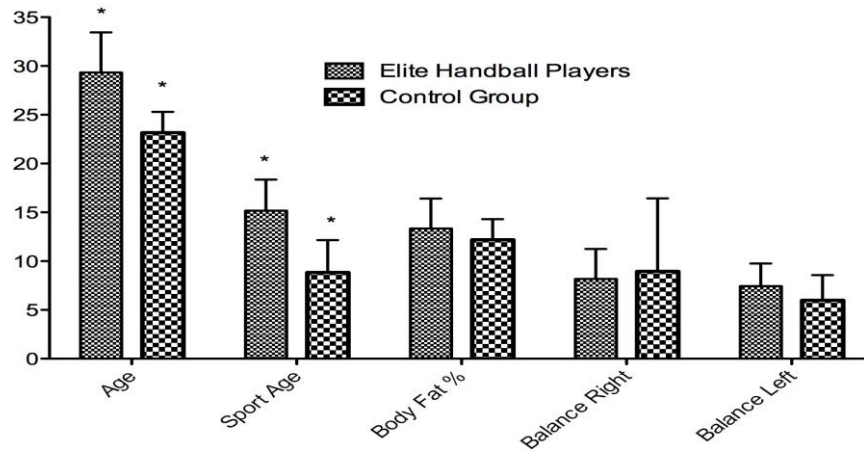
$(0.00133 \times \text{thigh skin fold in mm}) - (0.00131 \times \text{subscapular skin fold in mm})$ ). The height and weight of the subjects were measured by Seca (Seca, Hamburg, Germany) scale and stadiometer. Graphpad Prism (Chicago, USA) was used for the descriptive statistics and statistical comparisons.

**Findings**

**Table 1. The Physical Features and Other Parameters of Elite Handball Players and Control Group (average ± ss)**

	Elite Handball Players	Control Group
Age	29.3±4.1*	23.2±2.1*
Sport Age	15.2±3.2*	8.8±3.3*
Height (cm)	189±6.6*	181.1±7.7*
Weight (kg)	96.2±13.3*	79.8±10.7*
Body Fat %	13.3±3.1	12.2±2.1
Balance right	8.2±3.1	8.9±7.5
Balance left	7.4±2.3	6.0±2.6

\* Statistically significant  $p < 0.05$



**Figure 1. The age, sport age, body fat %, balance values of the elite handball players and control group (\* $p < 0.05$ )**

The values between the groups were compared by using Mann-Whitney U test and the statistical significance was accepted as  $p < 0.05$ . In the age variable, it can be seen that the average age of handball players (29.3±4.1) playing in the Turkish Handball Super League is significantly higher than of the control group (23.2±2.1). In addition to these, as it can be seen in Table 1, the sport age, height and weight values of the elite handball players are significantly higher than the values of control group. The body fat percentage value of elite handball players (13.3±3.1) is also higher than the value of control group (12.2±2.1). As the balance values of handball players (8.2±3.1) are better than the values of control group (8.9±7.5) on the right foot, the values of control group (6.0±2.6) are better than of elite handball players (7.4±2.3) on the left foot. The differences in the variables of body fat percentage,

left and right foot balance values between the groups are not statistically significant.

**Discussion**

It can be seen that elite handball players with the average age of 29.3±4.1 are significantly older than the control group. It is understood that this value is quite higher than the value of Tunisian National Male Handball Team (24.3±3.4) in the study by Chaouachi et al. (2009), the value of France national league players (21.0) in the study by Buchheit et al. (2009) and the value of Croatian National Male Handball Team (26±3.8) in the study by Sporis et al. (2010). The average age of Iranian national team who has obtained the silver medal in 2010 Asian Games is 24±3.8 (Shahbazi, Rahimizadeh, Rajabi, & Abdolmaleki, 2011).

In this study, the average sport age of elite handball players is seen as 15.2±3.2 and it is



determined that this value is significantly almost two times more than the value of the students from School of Physical Education and Sport whose average sport age is seen as  $8.8 \pm 3.3$  years. In literature review, any value about the sport age of handball players is not found, nevertheless it is thought that the value of their sport age maybe high depending upon the value of their age.

It can be seen that the elite handball players whose average height is  $189 \pm 6.6$  cm is significantly different from the control group whose average height is  $181.1 \pm 7.7$ . In the review study by Ziv and Lodor (2009) which is aimed to compare the physiologic and performance features of handball players playing in national leagues and national teams, the average of data from nine studies is seen as 182.6 cm. Because of the fact that the raw data isn't obtained, the statistical comparisons can't be applied, yet the average height value of Handball Super League team in our study is not only significantly higher than value of the control group but also is higher than the average height of international players.

In this study, the average weight of super league handball players is seen as  $96.2 \pm 13.3$  kg and this value is significantly higher than the value of control group. In the review study by Ziv and Lodor (2009), the average weight of six teams playing in the similar levels is 87.4 kg. The weight value of our study in direct proportion to the height is higher than the world average.

In our study, the body fat percentage of experimental group is found as  $13.3 \pm 3.1$  and this value isn't statistically significant. In some similar studies the values are like that; the body fat percentage of Tunisian National Male Handball Team is seen as  $15.4 \pm 3.7$  in the study by Chaouachi et al. (2009), besides the body fat percentage value is also seen as 14.1 in the study by Gorostiaga, Granados, Ibanez, Gonzalez-Badillo, and Izquierdo (2006) which is aimed to investigate the physical changes of an elite team participating European Handball Champions League. When we compare our study with both the control group and the similar studies in the literature, it is understood that the body fat value of experimental group is within accepted limits and in a better condition.

In flamingo balance test, the low values except zero (0) is accepted as the better balance score. It can be seen that as the balance values of experimental group ( $8.2 \pm 3.1$ ) are better than the values of control group ( $8.9 \pm 7.5$ ) on the right foot, the values of control group ( $6.0 \pm 2.6$ ) are better than the values of elite handball players ( $7.4 \pm 2.3$ ) on the left foot. There isn't any statistically significance between the groups in flamingo test. It can't be seen any study or data about balance of handball players in literature review.

### Conclusion

In this study performed on a team playing in the Turkish Handball Super League, the physical values are significantly different from the control group

consisting of the students from School of Physical Education and Sport positively. The physical data of elite handball players are compared to the international studies especially on the handball players in the similar level. It is obviously understood that the average age value of experimental group in our study is higher than the international values (Gorostiaga et al., 2006; Shahbazi et al., 2011; Sporis et al., 2010; Ziv & Lidor, 2009). The standstill period of Turkish Handball after its rapidly development between the dates 1990-2005 and the failure of youth setup works can be seen as the some probable reasons of it. Besides, it is determined that the elite handball players begin to play handball at the age of 14 and even if this value is enough, it results from the high average age value of handball players. Because of the fact that to make the handball players begin to the sport earlier or to canalize the promising players to the handball will bring much more success to this sport branch.

In height and weight variables, the elite handball players are seen in a better condition in comparison to both the control group and the players in the similar levels. Although the elite handball players of Turkey, who are physically higher values, are very successful individually, we can't equally get succeed in international area.

It is impossible to say anything accurate about the relationship between the physical data and the international success with this study only. Since this study doesn't measure other motor features and it is not also aim of the study. Further studies which measure the motor features have to apply and they will give detailed information about the characteristic features of elite handball players in Turkey and enable to compare them with the international opponents.

Despite of the fact that the body fat percentage value of players is higher than the control group, it shows great similarity to the values in the international literature and it is also within accepted limits. When the flamingo balance value of players is compared with the control group, it can be seen that the balance value is better for right foot, but it isn't better for left one. So it can be said that it is essential not to accept these values as norm values because of the fact that the number of people in the groups aren't quite adequate for this.

The participation of the limited number of people and the lack of measuring some motor features such as speed, strength, resistance, flexibility can be seen as the limitations of the study. This is because of the limited time and possibilities. Finally, further studies must be performed on a great number of subjects and also motor features mentioned above, besides measure some shooting and speed parameters peculiar to handball.

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