

# Fitness Level and Body Composition of Elite Female Players in England Basketball League Division I

Daniel Berdejo-del-Fresno<sup>1,\*</sup>, Amador J. Lara-Sánchez<sup>2</sup>, José M. González-Ravé<sup>3</sup>

<sup>1</sup>England Futsal National Team and Sheffield FC Futsal, United Kingdom.

<sup>2</sup>Lecturer in the Faculty of Education, University of Jaén, Spain.

<sup>3</sup>Faculty of Sport Sciences, University of Castilla La Mancha, Spain.

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## Abstract

**Background:** Basketball is one of the most practised sports in the world. There is a huge amount of articles analyzing the anthropometry of basketball players, the parameters of basketball, its physiological demands, and the fitness level of the teams. However, the vast majority of these studies focus on male basketball players. There are only a few studies working on British high-level female basketball teams. **Research question:** To evaluate and compare the body composition and fitness characteristics of elite British female basketball players in relation to other studies. **Type of study:** Descriptive study. **Methods:** 14 elite level female basketball players from a top-4 team that compete in the England Basketball League Division I voluntarily participated in this study. The anthropometry measurements performed were: weight, height, arm span, BMI, and skin folds. The fitness tests were: Flexibility (sit and reach), Agility 1 (4x10-meter shuttle run), Lower Body Power 1 (Standing Broad Jump), 20-meter shuttle run, Sprint (5 and 10-meter), Agility 2 (Left and Right), Lower Body Power 2 (Hop, Triple Hop, Cross-over Hop), and Yo-Yo Test. **Results:** Statistical differences were found between the right and left leg of players in the Triple hop ( $p=0.04$ ) and Cross-over hop ( $p=0.01$ ). Furthermore, regarding VO<sub>2</sub>max, statistical differences were found between the VO<sub>2</sub>max that had been calculated by Yo-Yo IR2 and the VO<sub>2</sub>max that had been calculated by the 20-meter shuttle run test, without taking into account the players' age ( $p=0.002$ ). **Conclusions:** The sample analyzed of elite British female basketball players had fitness level and body composition values lower than high-level female basketball teams from countries where basketball is more popular and better developed.

**Keywords:** BMI, Arm span, Body fat, Flexibility, Agility, Speed, Endurance.

## Introduction

Basketball is one of the most practised sports in the world. In spite to this, it is not too popular in England and the United Kingdom. Still, thanks to the London 2012 Olympic and Paralympics Games, basketball has been further developed during the last decade.

Basketball is an intermittent sport where a large number of different activities and situations are developed [1]. Besides, basketball is characterised by speed and repeated changes in the direction of activities and movement, especially since May 2000 when the rules were modified [2]. There is a huge amount of articles analysing and studying the anthropometry of basketball players, the parameters of basketball, its physiological demands, and the fitness level of the teams [2-14]. Those papers deal with the body height, weight and arm span in the high level. Also, it is known that the maximum oxygen uptake of basketball players ranges between 50 and 74.4 ml/kg/min VO<sub>2</sub>max, and a volume lower than 50 ml/kg/min VO<sub>2</sub>max is not recommendable in the high level [15]. However, the vast majority of these studies focus on male basketball, as opposed to female. There are only a few studies

working on British high level female basketball teams. In particular, there does not seem to be any study which analyses both the anthropometry and the fitness level of top level female basketball players in the United Kingdom. Bale [16] only determined the physical and body composition of eighteen members of the under-17 England Basketball squad to examine these variables in relation to playing position, and Deletraxt & Cohen [17] evaluated a number of top-4 teams from the England National League Division II. Thus, one of the aims of the present paper was to fill in the knowledge gap regarding this research question on high level teams.

In addition, the knowledge of body composition and fitness level of the players and their evolution through the season is very helpful for the Head Coach, as well as for the Strength & Conditioning Coach [15, 18]. Both of them can use these values to coach and train the team in relation to certain particular aspects that need to be improved in order for the team to achieve the elite or a better performance [15, 19].

The aim of this study was therefore twofold: a) to fill in the knowledge gap by contributing with a description of the body composition and fitness characteristics of elite British female basketball players, and b) to evaluate and compare the resulting values with the few studies available in the literature.

\*Corresponding author: Daniel Berdejo-del-Fresno

Tel: 00447532378157

E-mail: daniberdejo@gmail.com

## Methods

### Subjects

Fourteen elite female basketball players from a top-4 team that competes in the England Basketball League Division I volunteered to participate in this study after having signed the corresponding informed consent. The team was made up by 2 members of the Senior Great Britain Women Basketball Team, a member of the Under 20 Great Britain Women Basketball Team and Under 18 England Women Basketball Team, a member of the Under 20 Great Britain Women Basketball Team and Under 18 Scottish Women Basketball Team, 2 players of the Under 20 Hungary Women Basketball Team, 2 USA professional players, and 6 non-international British players. At the time of the tests performance, all the subjects were in the middle of the regular season (December).

### Anthropometric Tests

Anthropometric measures were taken, following the Lohmann et al.[20] instruction. Standing height and arm span were measured with a precision of 0.1 cm with a stadiometer and a tape measure, respectively (SECA Ltd, model 220, Germany). Body mass (kg) was recorded with a scale SECA (SECA Ltd, Germany) to the nearest 100 g, the subjects wearing light, indoor clothing and no shoes. The Body Mass Index (BMI) was calculated using the Quetelet formula. The skinfold measured were subscapular, supraspinal, abdominal, triceps, thigh, and calf and the body fat percentage was estimated according to the Carter [21] equation.

### Fitness Tests

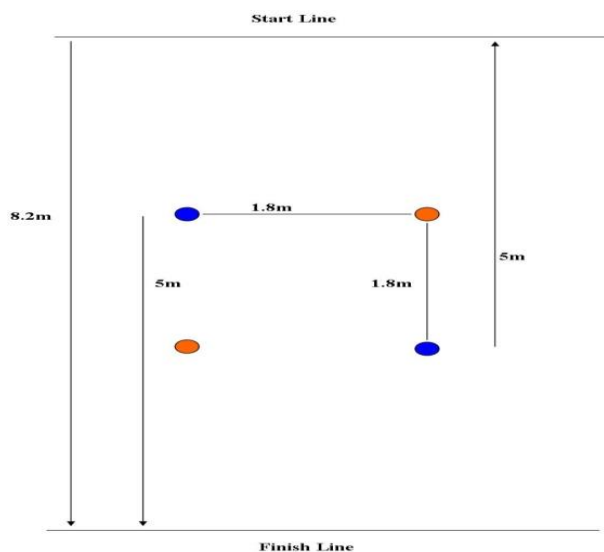
The fitness tests were selected based on validated batteries commonly used in sport in different cross-sectional and longitudinal studies. These tests are described in detail in a specific article [22]. Each subject performed all tests on two separate and non-consecutive days. On the first day, players performed the Flexibility (sit and reach), Agility 1 (4x10-meter shuttle run), Lower Body Power 1 (Standing Broad Jump) tests, as well as the 20-meter shuttle run or Bleep Test. On the second day, the Sprint (5 and 10-meter), Agility 2 (Left and Right), Lower Body Power 2 (Hop, Triple Hop, Cross-over Hop) and Yo-Yo tests were made.

### First day's Tests:

- Flexibility (sit and reach). This test is part of the FITNESSGRAM battery [23]. The subjects attempted to reach forward as far as possible from a seated position with both legs straight and without bending the knees. Two alternative repetitions were carried out and the best attempt was recorded.
- Agility 1 (using shuttle run 4 x 10-meter). This test is a variation of the shuttle run (10 x 5-m) test included in the EUROFIT battery [24].
- Lower body power 1 (using standing broad jump). In the standing broad jump test, the subject had to push off vigorously and jump as far as possible trying to land with both feet together. The score is the distance from the take-off line to the point where the back of the heel which is nearest to the land is. Two non-consecutive repetitions were carried out and the best attempt was recorded.
- Cardiorespiratory fitness 1 (20-meter shuttle run test or Bleep test) [25]. In this test, the initial speed is 8.5 km/h, which is increased by 0.5 km/h per min (1 min equals one stage). The subjects ran in a straight line, to pivot upon completing a shuttle, and to pace themselves in accordance to the audio signals given. The test is finished when the subject stops or fails to reach the end lines concurrent with the audio signals on two consecutive occasions. The equation of Léger & Gadoury [26] was used to estimate the maximum oxygen uptake ( $VO_2max$ ):
 
$$VO_2max = 20.6 + \text{Last stage completed} \times 3$$
 Furthermore, the equation of Léger et al. [25] was used to estimate the maximum oxygen uptake ( $VO_2max$ ) considering the player's age:
 
$$VO_2max = 31.025 + 3.238S - 3.248A + 0.1536SA$$
 where A is the age (years) and S refers to the final speed ( $S = 8 + 0.5 \times \text{Last stage completed}$ ).

### Second day's Tests:

- Sprints (5 and 10-meter sprint): Players have to run as fast as possible in both the 5 meter-sprint and the 10 meter-sprint, starting in a stationary position. Three attempts of each test were performed and the best of them was recorded. Two photoelectric cells Eleiko Sport MAT RS 232 (United Kingdom) were used to record the times of the 5 and 10-meter sprint tests.
- Agility 2: This test has been developed at the University of Salford (United Kingdom). The test is set up as follows (Figure 1): The coloured circles are the coloured rubber discs provided. Players begin at the start line opposite the blue disc. When a sprint to the blue disc is instructed, they must turn on it using the left foot, run to the diagonal blue cone, turn on it using the right foot and sprint through the finish line. The next time, they must begin at the start line opposite the orange disc. When a sprint to the orange disc is instructed, they must turn on it using the right foot, run to the diagonal orange disc, turn on it using the left foot and sprint through the finish line. Two attempts were performed for each side and the best attempt was recorded.



**Figure 1.** Agility 2 Test

This test to measure the agility capacity has been developed at the University of Salford (United Kingdom).

- Lower Body Power 2: These tests were described by Noyes et al.[27] with the aim find lower limb asymmetry.
  - o Hop: For the single hop for distance, the players stand on one leg, perform one hop as far as possible, and land on the same foot. The single hop for distance was performed three times on each foot. The best of the three values for each foot was the final score.
  - o Triple hop: For the triple hop for distance, the players stand on one leg, perform three consecutive hops as far as possible, and land on the same foot. The triple hop for distance was performed three times on each foot. The total distance hopped is the best of the three values of each foot.
  - o Cross-over hop: The cross-over hop test is performed on a course consisting of a 15 cm marking strip on the floor which extended approximately 6 m. The players hop three consecutive times on one foot, crossing over the centre strip on each hop. The cross-over hop for distance was performed three times with each foot. The best of the three values of each foot was the final score.
- Cardiorespiratory fitness 2 (using the Yo-Yo Intermittent Recovery Test level 1) [28]. The development of the test was inspired by the Leger multistage fitness test [25]. As in the 20-meter shuttle run test or Leger test, the participants in the Yo-Yo IR test must run 20 m shuttles; however, each shuttle is interspersed with a recovery period. Thus,

the Yo-Yo IR tests consists of 2 x 20 m shuttle runs at increasing speeds, interspersed with a 10-second period of active recovery (controlled by audio signals from a compact-disc player). The equations of Bangsbo et al. [28] were used to estimate the maximum oxygen uptake ( $VO_{2max}$ ):

$$VO_{2max} = IR \text{ distance (m)} \times 0.0084 + 36.4$$

### Statistical Analyses

Mean  $\pm$  standard deviation of the data was calculated. Normal distribution and homogeneity of the parameters were checked with Shapiro–Wilk, and Levene’s test. The statistical differences were assessed by using Student’s *t* test. A *P* value of 0.05 or lower was considered as being statistically significant. An analysis was performed using SPSS version 16.0 (Chicago, IL, USA).

### Results

All the variables were normally distributed. Levene’s test showed no violation of homogeneity of variance. The group characteristics were the following: they were aged  $20.50 \pm 2.31$ , had a Body Mass Index (BMI) of  $24.67 \pm 4.23$ , a weight of  $75.21 \pm 15.38$  kg, and a height of  $174.21 \pm 4.17$  cm. The body composition values of the female elite basketball players participating in this study are indicated in Table 1. Table 2 shows all the fitness test results.

Statistical differences between both legs were found for Triple hop ( $p=0.04$ ) and Cross-over hop ( $p=0.01$ ). On the contrary, no differences were observed in the Agility 2 test and the hop. Furthermore, regarding  $VO_{2max}$ , statistical differences were found between the  $VO_{2max}$  calculated by Yo-Yo IR1 and the  $VO_{2max}$  calculated by the 20-meter shuttle run, without taking into account the subjects’ age ( $p=0.002$ ). Similarly, there were statistical differences between the two  $VO_{2max}$  obtained from the 20-meter shuttle run ( $p=0.000$ ) – i.e. between the formula that takes the age into account and that which does not consider said parameter (Table 2).

### Discussion

#### Body Composition

The results of anthropometric measures showed that the average height of the team was lower than the values given by Salgado-Sánchez et al. [29] regarding Spanish first (183.2 cm) and second (180.2 cm) division players, and in the same line as third division (174.8 cm) players. Basinac et al. [30] also obtained higher heights in players from Bosnian first league teams (177.6 cm). Nunes et al. [31] analysed the Brazilian National Team that participated in the 2004 Olympic Games, and obtained a height of 182.6 cm. Carter et al. [32] examined 14 teams from the Women’s World Basketball Championships, Australia 1994, and found a height of 180 cm. Cook et al. [33] and Drinkwater et al. [34] also obtained higher heights in Australian elite or national junior basketball players (177.6 cm and 178.0 cm, respectively). Similarly, Payne et al. [35] showed higher values (176.9 cm) in college varsity players than the values in this study.

On the other hand, the values of this paper were similar to Greek basketball players from second division (174.7 cm) [36] and to those found in 4 top-ranking teams of the England National League Division II (174.5) [17]. Fernández-Río et al. [37] obtained similar values in second division Spanish players

(173.8 cm), and so did Narazaki et al. [38] with NCAA division II players. Lastly, Hopper [39] and Drinkwater et al. [34] showed similar values in Australian netball players (173.5 cm) and state basketball players (174 cm).

**Table 1.** Body composition, playing position and level of female elite basketball players (n=14).

Subject	Position	Level	Age (years)	Height (cm)	Weight (kg)	BMI ( $m/kg^2$ )	Arm span (cm)	Sum of skin fold (mm)	Body Fat (%)
1	1	Sen GB	23	170	65	22.49	172	64	15.32
2	1	USA	23	172	61	20.62	179	67	15.89
3	1	U20GB	18	170	72	24.91	169	89	19.84
4	1	U20GB	18	170	64	22.15	171	71	16.39
5	2	Sen GB	25	177	69	22.15	183	68	16.18
6	2	Non-I	19	170	64	22.15	169	78	17.78
7	2	U20H	19	170	72	24.91	165	92	20.48
8	3	Non-I	21	179	72	22.60	172	96	21.36
9	3	U20H	19	176	85	27.44	181	90	20.10
10	3	Non-I	19	171	60	20.52	179	86	19.32
11	4	Non-I	19	179	82	25.59	185	88	19.70
12	4	Non-I	20	179	73	22.78	191	88	19.76
13	5	USA	24	176	102	32.93	184	92	20.74
14	5	Non-I	20	181	112	34.19	182	106	23.22
<b>Mean</b>	-	-	<b>20.50</b>	<b>174.21</b>	<b>75.21</b>	<b>24.67</b>	<b>177.29</b>	<b>83.93</b>	<b>19.01</b>
<b>SD</b>	-	-	<b>2.31</b>	<b>4.17</b>	<b>15.38</b>	<b>4.23</b>	<b>7.60</b>	<b>12.41</b>	<b>2.34</b>

**Table 2.** Fitness test results of female elite basketball players (n=14).

Tests	Mean	SD	Max	Min	Range
Flexibility (Sit&Reach) (cm)	5.95	7.36	15	-10	25
Agility 1 (4x10m shuttle run) (s)	10.18	0.5	11	9.3	2
Agility 2 (left side) (s)	2.27	0.24	2.79	1.96	0.84
Agility 2 (right side) (s)	2.26	0.23	2.73	2.02	0.72
5-meter Sprint (s)	1.31	0.08	1.41	1.19	0.22
10-meter Sprint (s)	2.23	0.13	2.41	2.03	0.38
Standing Broad Jump (cm)	196.42	19.86	230	163	67
Hop (left) (cm)	154.64	17.05	184.67	120.67	64
Hop (right) (cm)	153.78	20.25	185.53	114.33	71
Triple Hop (left) (cm)	519.4	57.31	628.67	429	199.67
Triple Hop (right) (cm)	532.41	67.28	655.33	408.67	246.67
Cross-over Hop (left) (cm)	478.81	65.82	614.67	368.67	246
Cross-over Hop (right) (cm)	497.92	64.01	621	381.67	239.33
20-meter shuttle run (stages)	8.19	1.39	10.5	6	4.5
20-meter shuttle run (VO <sub>2</sub> max)	45.18	4.17	52.1	38.6	13.5
20-meter shuttle run (VO <sub>2</sub> max*)	42.01	4.46	50.6	35.48	15.12
Yo-Yo IR1 (stages)	14.67	0.95	16.2	13.2	3
Yo-Yo IR1 (distance) (m)	701.54	265.14	1160	360	800
Yo-Yo IR1 (VO <sub>2</sub> max)	42.29	2.23	46.14	39.42	6.72

\* This value has been calculated using an equation which takes into account the basketball players' age.

Only Greene et al. [40]; Tsunawake et al. [41] and Koley & Singh [42] had players smaller (166.19, 166.5, and 160.32 cm,

respectively) than those that participated in the present study. However, those samples were made up by players from high

school that were aged 16.02, 17.06, and 17.69, respectively. To sum up, the height of the players participating in this study was greater than high school players and similar to Spanish and Greek second division players, but it is much lower than the values of high level players (first divisions and World Championships).

Regarding weight, our players showed the highest weight values. Only Salgado-Sánchez et al. [29] obtained higher values, although that was just in Spanish second division players. Besides, taking into account the players' BMI value (24.67), they were very close to the over-weight zone (25). Obviously, this BMI was also the highest of all studies. Finally, the average Body Fat (%) was 19.01 %. This value is slightly higher than the value found in high level players by Salgado-Sánchez et al. [29], Jelacic et al. [43], Tsunawake et al. [41], and Fernández-Río et al. [37], as well as being the value found for senior female basketball players (between 14 % and 18 %), according to Gualdi-Russo et al. [44] and Bale [16]. In addition, the sum of the skin folds resulted in a value (83.93 mm) which is not recommended at a high performance level.

Most of the coaches want to have players with a large arm span, since it is an advantage when it comes to stealing the ball, catching a rebound or doing a deflection. Nevertheless, there are not many studies that show a benchmark for this parameter in spite of the great importance that it bears in basketball. The arm span value obtained in the present study (177.29 cm) is lower than that found by Ackland et al. [46] before the Women's World Basketball Championships held in Australia in 1994. This, together with the low height and the elevated weight, BMI, and Body Fat (%), shows that these players did not possess the most appropriate body composition factors for the practice of high level basketball [15] (i.e. World Championships, Olympic Games, European Championships or first division teams in countries such as USA, Australia, Russia, Spain, or France where female basketball has a very good level).

### **Fitness**

Despite being a positive number, the flexibility value obtained in the players that participated in the present study (5.95 cm) does not show an outstanding result, and could perfectly be classified as normal [47] and lower than the result obtained by Cook et al. [33] (12.33 cm) in Australian elite junior players. It is important to take into consideration the great heterogeneity in the group analysed in this study, with a range of 25 cm among players. The application of a stretching protocol during a whole season has proved to result in long-term significant improvement of flexibility [48, 49]. Nowadays, there are already some studies that have showed flexibility improvements in elite sportsmen who have carried out training based in the Pilates method [50, 51]. Similarly, other studies support the usefulness of the application of kinesio-taping to improve this capacity [52].

Regarding the Agility 1 test, there have not been found any other studies that involve basketball players and make use of the same test (4x10 m shuttle run) to measure the speed of movement and the coordination in an integrated way [22].

Having said this, the choice of this test was a thoughtful decision, since it is a good way to test the basketball players' ability to make changes of speed and directions similar to those performed in a basketball game. The result obtained (10.18 s) in this study was similar to the value obtained by Berdejo-del-Fresno [48] in relation to Spanish male junior basketball players at the beginning of the season (10.13 s) and better than that found in highly trained Spanish young tennis players at specific times during the season (11.42-11.37-11.05 s) [53, 54]. The Agility 2 test did not show any differences between the legs with respect to the changes in direction; it is therefore deduced that in the subjects there is not any unbalance between the lower limbs in terms of agility. Graham-Smith & Pearson [55] examined the combined effects of physical attributes and technique in a simple 2x5 m test which is quite similar to the test used in the present study, concluding that performance was associated with a combination of speed, eccentric strength and specific aspects of technique. They also observed that better agility performances were associated with lower contact times on the turning foot (which in turn were related to shorter last stride lengths, greater backward trunk inclination at contact, greater knee flexion in the turn and greater horizontal drive-off forces). Jones et al. [56], in the same line than Graham-Smith & Pearson [55], suggested that, for basic improvements in change of direction and speed, athletes should seek to maximise their sprinting ability and enhance their eccentric knee flexor strength to allow effective neuromuscular control of the contact phase of the change of direction and speed task. Finally, Graham-Smith et al. [57] added that the penultimate contact plays a significant role in deceleration when changing direction, i.e. greater braking forces in the penultimate contact are associated with faster agility times. Therefore, if basketball players wish to improve their agility capacity, they will have to work on their sprinting ability, their eccentric knee flexor strength and their body position before turning.

The speed tests (5 and 10-meter sprint) have shown that the basketball players in this study are slower than those participating in other studies. Mikolajec et al. [58] analysed the Under 17 Women Polish Basketball Team and found a time of 1.26 s in the 5-meter sprint at the beginning of the camp and a time 1.18 s six weeks later. Jones et al. [56] also obtained better times in 33 physically active university students with a background in several sports (1.08 s). In relation to the other speed test (10-meter sprint), Vaquera et al. [59] analysed a male junior team with a 10-meter sprint test and a 10-meter sprint test integrated in a court training. The results that they obtained were 1.9 and 1.96 s, respectively. Vaquera et al. [60] reported values of Spanish first and second division basketball players in the 10-meter sprint. First division players (1.70 s) were slower than second division basketball players (1.66 s). In the same study [60], guards and forwards were quicker (1.66 s) than centres (1.72 s). Finally, Cook et al. [33] found in Australian elite junior players times of 1.91 s for women and 1.76 for men. Despite the fact that some of the above mentioned studies showed values corresponding to young or male sportsmen, the difference between their values and the

values in this study is considerable. Thus, it is clear evidence that the basketball players that took part in the present study need to work harder on their speed.

In relation to lower body power, the standing broad jump test showed a poor performance (196.42 cm) [61-63]. The Hop test measures were also very low (154.64 cm and 153.78 cm for the left and the right leg, respectively) and did not involve significant differences between legs, unlike the Triple hop test and the Cross-over hop test, which did show significant differences between legs. This fact corroborates that the players that were evaluated in the present study had difficulties to perform two or more consecutive jumps without it affecting the performance, not due to the lack of power in one of the limbs, but due to the lack of coordination in one of their legs (capacity to make several consecutive jumps) [17] or dynamic balance [64]. Jump capacity on one foot is a demanded gesture in basketball (lay-up shots) which requires good coordination and jump ability, in particular muscular power more related to the neuro-motor coordination [17].

The value of maximum oxygen uptake ( $VO_{2max}$ ) obtained with the different formulas (45.18 ml/kg/min – 42.01 ml/kg/min – 42.29 ml/kg/min) was lower than that obtained by other authors: Vaccaro et al. [66]: 49.6 ml/min/kg; Riezebos et al. [67]: 50.1 ml/kg/min; Dal Monte et al. [68]: 49.6 ml/kg/min; Jousselein et al. [69]: 51.1 ml/kg/min; Smith & Thomas [70]: 51.3 ml/kg/min; Hakkinen [71]: 48 and 47 ml/kg/min; Franco [72]: 50.36 ml/kg/min; Fernández-Río et al. [37]: 46.6 ml/kg/min; Tsunawake et al. [41]: 56.7 ml/kg/min; Koley & Singh [42]: 46.54 ml/kg/min. The  $VO_{2max}$  values that were obtained from the different tests (Bleep test and Yo-Yo IR1) and the different formulas showed statistical differences between the  $VO_{2max}$  calculated by Yo-Yo IR1 and the  $VO_{2max}$  calculated by the 20-meter shuttle run, without taking into account the age ( $p=0.002$ ). Also, statistical differences were observed between the two  $VO_{2max}$  obtained from the 20-meter shuttle run ( $p=0.001$ ) – i.e. between the formula that takes age into account and the formula that does not consider it (Table 3). These differences were minimal in spite of the fact that some studies have established that the Yo-Yo test is more appropriate for intermittent sports [28] such as football, futsal, hockey, team handball, cricket, rugby, badminton or basketball.

It is important to note that the team analysed in this study do not usually perform specific Strength & Conditioning (S&C) sessions, which has been proved to be the reason why their fitness and body composition values are lower than those of the other professional female basketball teams. It must be said that, if British basketball teams wish to reach an international level, one of the aspects that they should work on during the whole season is their S&C, something that has been proved to play a central role in the development of basketball players [74-78]. In addition to this, the specific training would also increase the training load, which has been proved to be directly linked with body composition and fitness level in the high level [79].

### Conclusions

In the present study, it has been demonstrated that British

basketball players have fitness level and body composition values lower than other high level teams from countries where basketball is more popular and better developed. With regards to body composition, the players that participated in this study were smaller and heavier than those of first division teams, and similar to those of second division. They showed the highest values of BMI and Body Fat (%), these being counter-productive in the high level. Finally, the arm span values obtained in this study are lower than those found in the Women's World Basketball Championships (Australia, 1994). This, together with the low height and the elevated weight, BMI and Body Fat (%) of the players in this study, shows that they have values lower than those observed in countries (i.e. Russia, Spain, France, USA...) or competitions (i.e. World Championships, Olympic Games, European Championships) where basketball is more professional and has a longer tradition, as well as a higher level. As for the fitness level, the players in this study showed low flexibility, speed, power and maximum oxygen uptake ( $VO_{2max}$ ) values, but average agility results.

Finally, we suggest that they should focus on the improvement of  $VO_{2max}$  and should carry out plyometric training to increase speed and power. In addition, if basketball players wish to improve their agility capacity, they will have to work on their sprinting ability, their eccentric knee flexor strength, and their body position before turning. Finally, it must be said that the role of an S&C coach as part of the technical staff is essential and highly recommended if the aim of a team is to reach high level competition.

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**AUTHORS BIOGRAPHY****Daniel Berdejo-del-Fresno****Employment**

England Futsal National Team and Sheffield FC Futsal (United Kingdom)

**Degree**

PhD Student

**Research interests**

Strength and Conditioning in High Performance, Periodization, Monitoring of Training Physical Activity and Health, Physical Education

**E-mail :** daniberdejo@gmail.com

**Amador J. Lara-Sánchez**  
**Employment**

Lecturer in the Faculty of Education. University of Jaén (Spain).

**Degree**

PhD

**Research interests**

Sports and Health Training

**E-mail:** alara@ujaen.es

**José M. González-Ravé****Employment**

Director of Sport Training Laboratory. Associate Professor. Faculty of Sport Sciences. University of Castilla La Mancha (Spain).

**Degree**

PhD

**Research interests**

Strength and Conditioning in High Performance, Periodization, Monitoring of training

**E-mail:** josemaria.gonzalez@uclm.es