ORIGINAL

EFFECT OF SMALL-SIDED GAMES ON FOOTBALL PLAYERS

EFECTO DE LOS JUEGOS REDUCIDOS SOBRE JUGADORAS DE FÚTBOL

Pérez, S.1; Rodríguez, A.1; Sánchez, A.1; De Mena, J.M.1; Fuentes, J.M.2; Castaño, R.1 y Martín, N.3

1 PhD in Education Science. Professor of the Degree of Physical Activity and Sports Sciences. Pontifical University of Salamanca. Spain. sperezmu@upsa.es, arodriguezca@upsa.es, asanchezmu01@upsa.es, jmenara@upsa.es, jmenara@upsa.es, rcastanoca@upsa.es
2 PhD in Psychology. Professor of the Degree of Physical Activity and Sports Sciences. Pontifical University of Salamanca. Spain. jmfuentesbl@upsa.es.
3 Bachelor’s Degree in Primary Education: Area of Concentration – Physical Education. Pontifical University of Salamanca. Spain. noefrancos@hotmail.com.

Spanish-English translator: Víctor Gutiérrez Martínez, Idiomas León, victor@idiomasleon.es

Código UNESCO: 5899 Educación Física y Deportiva / Physical education and sport.
Clasificación del Consejo de Europa: 17. Otras (iniciación deportiva) / Other (sport initiation).

Recibido 26 de julio de 2017  Received July 26, 2017
Aceptado 21 de noviembre de 2017  Accepted November 21, 2017

ACKNOWLEDGEMENTS

The authors want to thank those young people and parents who participated for the willingness that they showed during the development of this study. Furthermore, they want to express their gratitude for the unconditional collaboration of the Women’s Football Club of Salamanca, resulting in the assistance from the technicians and those in charge of the lower categories.

ABSTRACT

The objective has been to analyze how small-sided games or SSGs affect physical, technical and changes of direction (CODA) in U12 female soccer players. They conducted 14 training sessions based on reduced soccer games. The sample has normal values in the Sapiro-Wilk test, and in the Student’s t
test it shows that there are statistically very significant differences \( p \leq 0.00 \) in all the analyzed physical variables, less in the case of the explosive force. In the technique variables we show that there are significant differences in all variables analyzed \( p \leq 0.00 \). Finally, there are positive and statistically significant correlations between the different variables analyzed. In this way we can consider reduced games are a suitable and very advantageous method for training in the initial stages or training in soccer players.

**KEYWORDS**: football learning; Small-sided games; physical-fitness; technique; Women.

**RESUMEN**

El objetivo ha sido analizar cómo influyen los juegos reducidos o SSGs sobre la condición física, técnica y los cambios de dirección (CODA) en jugadoras alevines de fútbol femenino. Participan 12 jugadoras de fútbol femenino. Realizaron 14 sesiones de entrenamiento basado en juegos reducidos de fútbol. La muestra presenta valores normales en la prueba de Saphiro-Wilk, además, en la prueba de t de Student muestra que existen diferencias estadísticamente muy significativas \( p \leq 0.00 \) en todas las variables físicas analizadas, menos en el caso de la fuerza explosiva. En las variables de técnica nos muestra que existen diferencias significativas en todas las variables analizadas \( p \leq 0.00 \). Por último existen correlaciones positivas y estadísticamente significativas entre las distintas variables analizadas. De esta forma podemos considerar los juegos reducidos son un método adecuado y muy ventajoso para el entrenamiento en las etapas iniciales o de formación en jugadoras de fútbol.

**PALABRAS CLAVE**: Fútbol base; juegos reducidos; preparación física; Técnica; Mujer.

**1. INTRODUCTION**

Football was born as a game in different areas and places. Its evolution over the centuries has turned it into the "king of sports" (Vitoria, 2005). Of course, in Spain it is the most practiced sport, standing out above the others (Pérez, Sánchez and Urchaga, 2015). This applies to men's football, and not to women's football which does not have the same impact. The data show that the number of player's licenses is considerably lower for women, 29,807, than for men, 684,320 (RFEF, 2015). Football is the king of sports par excellence, but it is not so for the women who practice it.

In recent years, studies on football performance have increased, leaving aside young players (González-Villoria, García-López & Contreras-Jordán, 2015). However, more research is needed regarding the initiation and training in the different categories (González-Villoría, et al., 2015). Nor are there many studies that focus on studying women who play football. There are studies that focus on the perceived exertion of inactive female players (Martínez, et al., 2015), on the
quantification of movements in children’s seven-a-side football (Barbero-Álvarez, Barbero-Álvarez, Gómez & Castagna, 2009), on the flexibility in under-19 football players (Del Rio, Flores, Bautista, Barajas, Tamara & Gómez, 2015) and indoor football (Ayala, De Baranda, Cejudo & De Ste, 2010), on the analysis of cohesion in under-16 football players (González-Sánchez, Amado, Pulido, López, & Leo, 2013), and the most specific one by Nevado-Garrosa and Suárez-Arrones (2015) on under-13 female players. However, they all exclusively measure the physical effects.

Reduced games or small-sixed games (SSGs) (Rampinini et al., 2007) fall within the scope of modern teaching models. They take into account their specificity (Dellal, Drust & Lago-Penas, 2012) and internal logic (Hernández, 1994), leaving the traditional models behind (Robles, Giménez & Abad, 2011). The reduced games (JR) are playful and sport motor situations (Parlebas, 2001) which include most of the factors that intervene in the real game in an adaptable way (Wein, 1995). The SSGs are games that simulate the sport totally or partially, and are a proper method for the improvement of the performance of the players (Katis & Kellis, 2009), and therefore, we would be speaking of the same term. The space and the rules are adapted to the smaller number of players (Little, 2009). These adaptations are enough to reproduce situations that occur in matches (Owen, Twist & Ford, 2004) as well as they serve to train for the unpredictable and the demands of football (Cristian, Riller, René, Denise, Milton & Alcides, 2015; Garrosa & Suárez-Arrones, 2015). In addition, they are suitable and very popular regardless of the age and level of the players (Hill-Haas, Dawson, Impellizzeri & Coutts, 2011), being especially necessary in the training stages (Casamichana, San Román, Calleja & Castellano, 2015). We are, therefore, before a type of tasks that capture the complexity and specificity of football, where players can improve all the elements involved in their performance (Dellal, Hill-Haas, Lago-Peñas & Chamari, 2011). As a consequence of the foregoing, they have become a way of usual training at all levels (Owen, Wong, Paul & Dellal, 2012).

There is a variety of studies focused on SSGs that analyse the quantification of the internal training load and of the physical condition (Casamichana, Castellano, González-Morán, García-Cueto & García-López, 2011, Dellal, et al., 2011, Hill-Haas , et al, 2011, Kelly & Drust 2009, Little & Williams, 2006, Martone, et al., 2017, Owen, et al., 2012), the technical aspects (Pérez, Sánchez, Sánchez & Yagüe, 2012; Yagüe, Fernández & Petisco, 2014; Soto & Pérez, 2014a), the tactical aspects such as playing time, possession and duration of the plays (Soto & Pérez, 2014b) and other studies regarding the manipulation of elements inherent to the game such as: number of players, space, presence of goalkeepers, players positions, distribution of equipment and rules (Abrantes, Nunes, Maças, Leite & Sampaio, 2012, Castellano, Casamichana & Dellal, 2013, Fradua, Zubillaga, Caro, Fernández-García, Ruiz-Ruiz & Tenga, 2013; Gonçalves, Figueira, Maças & Sampaio, 2014).

Before concluding, just one final note. The changes of direction (CODA) are one of the determining parameters of the performance in football players (Bangsbo, Mohr & Krustrop, 2006, Pardeiro & Yanci, 2017, Santiago, Granados, Quintela & Yanci, 2015) and in any other sport (Yanci, Castillo, Vizcay, Pitillas &
Iturricastillo, 2016), although not exclusively, since aerobic endurance, strength and speed are also necessary (Yanci, García, Castillo & Rivero, 2014). However, the research in this field focuses on the phases of the sport performance and on male population. In this respect, there are few works on the effect of reduced games (SSGs) on the CODA, but one of them would be the study made by Yanci, Reina, Los Arcos y Cámara (2013), which studies the effect of contextual interference on the improvement of the CODA, in a sample of underage people and comparing both boys and girls in the Year 2 of primary school (first year in Spain).

Summarizing, there are studies in young male players, as indicated above, however in the case of women these types of studies are scarce, nor are there studies that analyse the changes of direction (CODA) in these phases. Therefore, the purpose of this study is to analyse how the reduced games or SSGs influence the physical condition, technique and changes of direction (CODA) in under-12 female football players.

2 MATERIALS AND METHODS

2.1 METHODOLOGY

The research which is carried out is experimental and quantitative and is made through a field study with a pre-test, an intervention and a final post-test, to verify the effect of the intervention on the physical condition. Cook and Reichardt (1986) and Pita and Pértegas (2002) indicate that it is a quantitative research methodology, since observable, measurable and quantifiable data are collected and numerical results are offered.

2.2 SAMPLE

The sample consists of 12 under-12 female players with a high level of expertise (table 1), with an average age of 11.50 (± 0.511 years), with a weight of 43.25 (± 8.001 kg.) and an average height of 150.5 cm (± 10.475). All of them belong to the Women's Football Club of Salamanca that competes in the Under-12 category playing against the rest of the teams made up with children. It is the only team that is exclusively composed of female players, therefore the sample represents 85.71% of the population under study.

<table>
<thead>
<tr>
<th>N</th>
<th>Age (x̄)</th>
<th>Age (SD)</th>
<th>Weight (x̄)</th>
<th>Weight (SD)</th>
<th>Height (x̄)</th>
<th>Height (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>11,50 años</td>
<td>0,511</td>
<td>43,25 Kg</td>
<td>8,001</td>
<td>150,50 cm</td>
<td>10,475</td>
</tr>
</tbody>
</table>

2.3 MATERIAL

The experimental part has been developed in the club facilities in all areas: field material, training field and changing rooms. All measurements were made in the usual training field.

The physical - technical tests carried out were the following:
• Jump with both feet together: The female players were placed at the starting point, and without a race or previous movements, they had to jump forward to reach the greatest distance possible, falling with both feet in the same place (Amaya®, accuracy 2 mm).

• Course Navette or Beep test (aerobic endurance): The female players run uninterruptedly the distance of 20 m. stepping on the marked line, following the acoustic signals amplified with speakers (Sony ENG203® speakers) from a computer (Acer ® TravleMate 5720). The number of levels they manage to complete is recorded.

• Speed without ball in 20 m.: The female players start at the starting point and run 20 meters at the maximum possible speed. The same test is carried out while they handle the ball in order to measure their technique.

• Speed without ball in 10 m. with change of direction (CODA): The female players leave the starting position and run, first, 5 m. but halfway they make a 90° turn. The same test is carried out while handling the ball in order to measure the technique.

• Change of Direction Ability Test (CODA): for this purpose, the Modified Agility Test (MAT) is used. The female players run a total of 20 m. They leave the initial position with no previous movement, run for 5m. up to the middle and turn 90° to the left, they run again other 2.5 m., turn 180° and run 5m., then, they turn again 180° to the middle and they turn once more 90° and go back to the beginning. They basically perform the run in the shape of a "T". They perform it in a free-form run, an action similar to that one performed by the players in the field (Yanci, et al, 2014). The same test is carried out while they handle the ball in order to measure the specific dribble.

2.4 PROCEDURE

The data were collected in the facilities of the sports club, upon request and authorization of the parents, coaches and technical managers of the sports club. They were allowed to miss only once, as in similar studies (Sánchez, et al., 2014). The measures of the game space used for a 3 vs. 3 was of 30x20 m. and for a 4 vs. 4 was of 36x24 m, according to other researches (Kelly & Drust, 2009, Soto & Pérez, 2014b). A total of 14 training sessions were carried out based on the SSGs (40 minutes of intervention) and the technical and physical condition variables were analysed, with a duration of 90 m. per training session. All of them play a competition match per week, usually on Saturdays.

The objectives and contents of the sessions are distributed as follows: the first six sessions were played without goalkeepers or goals with the smallest space, which was 30x20m. The next six sessions were studied with small goals and the last two sessions were analysed with goalkeepers and large goals, all of
them with a space of 36x24m. Thus, the progression made is from possession
games, followed by games of possession, moving forward and scoring in small
goals and finally, the games of possession, moving forward and scoring in big
goals. In all the sessions, the technical contents inherent to the attacking
combination game model were worked on: control, passing, handling, dribbling
and shooting, mainly and tactically: acting as supports, losing one's marker,
acting as permanent support and running into free spaces. There are no
limitations on the players' touches and they played according to the football
rules, except for the implementation of the offside and for the fact that it is
allowed to throw-in from the touchline with the foot in order to speed up the
game since they always have balls around the field.

Before the intervention, specific physical and technical condition tests were
performed and measured by the same evaluator. All the measurements
followed the same process, the traditional warm-up exercises for 15 m. and at
the end, the tests were carried out. To achieve high reliability and avoid errors
in the measurements they were taught in the previous training the correct
execution and they were allowed to practice it. The Declaration of Helsinki was
respected to the letter.

2.5 STATISTICAL ANALYSIS

For the statistical processing of data, the statistical programme SPSS Statistics
20.0 was used. The statistical descriptions were calculated (mean and standard
deviation). The normality of the sample was verified with Saphiro-Wilk. The
effects of the training programme were analysed by comparing the data
obtained in the pre-test and the post-test through the Student's t test for related
samples. The differences between the results are considered significant if \( p \leq 0.05 \) or very significant if \( p \leq 0.00 \). Finally, the bivariate correlations were
analysed.

3 RESULTS

The purpose of the study was to analyse how the reduced games or SSGs
influence the physical condition, technique and changes of direction (CODA) in
female under-12 football players, with a training programme of 14 sessions.
After the intervention, the female players presented better average values of
physical condition (table 2). They improve in all aspects analysed: leg strength,
aerobic endurance, speed with change of direction and in CODA. However,
they do not improve in speed without the ball. In the explosive force, the
improvement is of more than 2 cm. on average, in the case of the Course
Navette or Beep Test, the improvement is of one level, in the case of the speed
without ball with turn, it results that they reduce the time between 0.03 and 0.02
sec., and finally in CODA, the improvement is marginal.
Table 2. Average results of the pretest and post-test physical condition.

<table>
<thead>
<tr>
<th>Test</th>
<th>Pretest</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jump with both feet together</td>
<td>167.42</td>
<td>169.83</td>
</tr>
<tr>
<td>Course Navette or Beep test</td>
<td>6.75</td>
<td>7.58</td>
</tr>
<tr>
<td>Speed for a distance of 10 m. with a 90º turn to the right</td>
<td>2.64</td>
<td>2.32</td>
</tr>
<tr>
<td>Speed for a distance of 10 m. with a 90º turn to the left</td>
<td>2.53</td>
<td>2.33</td>
</tr>
<tr>
<td>Speed for a distance of 20 m.</td>
<td>3.53</td>
<td>3.83</td>
</tr>
<tr>
<td>CODA (MAT)</td>
<td>7.33</td>
<td>7.24</td>
</tr>
</tbody>
</table>

Regarding the technical results, all the results improve (table 3). Especially relevant is the improvement they have had when handling the ball in a distance of 10 m. In particular, the right turn improves substantially more than the left turn, right 0.07 and left 0.04 sec, respectively. The results when handling the ball in a straight line also improve (0.02 sec.), although the improvement is lower than the one made in the 10 m. run, and finally, the dribble was also improved - CODA (0.65 sec.).

Table 3. Average results of pretest and post-test technique.

<table>
<thead>
<tr>
<th>Test</th>
<th>Pretest</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ball handling for a distance of 10 m. with a 90º turn to the right</td>
<td>3.84</td>
<td>3.11</td>
</tr>
<tr>
<td>Ball handling for a distance of 10 m. with a 90º turn to the left</td>
<td>3.5</td>
<td>3.15</td>
</tr>
<tr>
<td>Ball handling for a distance of 20 m.</td>
<td>4.28</td>
<td>4.10</td>
</tr>
<tr>
<td>Dribble - CODA (MAT) with ball.</td>
<td>10.15</td>
<td>9.50</td>
</tr>
</tbody>
</table>

There are statistically very significant differences (p ≤0.00) in all the analysed variables, except for the explosive force when jumping with both feet together, where there are no significant differences after the intervention performed (table 4), although it does present better results.

Table 4. Significant differences: Physical condition.

<table>
<thead>
<tr>
<th>Test</th>
<th>Pretest</th>
<th>Post-test</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jump with both feet together</td>
<td>167.42</td>
<td>169.83</td>
<td>0.183</td>
</tr>
<tr>
<td>Course Navette or Beep test</td>
<td>6.75</td>
<td>7.58</td>
<td>0.000**</td>
</tr>
<tr>
<td>Speed for a distance of 10 m. to the right without ball</td>
<td>2.64</td>
<td>2.32</td>
<td>0.00**</td>
</tr>
<tr>
<td>Speed for a distance of 10 m. to the left without ball</td>
<td>2.53</td>
<td>2.33</td>
<td>0.008**</td>
</tr>
<tr>
<td>Speed for a distance of 20 m. without ball</td>
<td>3.53</td>
<td>3.83</td>
<td>0.000**</td>
</tr>
<tr>
<td>CODA without ball</td>
<td>7.33</td>
<td>7.24</td>
<td>0.002**</td>
</tr>
</tbody>
</table>

* p ≤ 0.05 / ** p ≤ 0.00

Regarding the technique, there are significant differences in all the variables analysed (table 5). On the other hand, in the case of the handling the ball for a distance of 20 m. in a straight line, the difference is significant, while in the other analysed variables the differences are very significant (p ≤0.00).
Table 5. Significant differences: Technique.

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Post-test</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ball handling for 10 m. with 90º turn to the right</td>
<td>3.84</td>
<td>3.11</td>
<td>0.004**</td>
</tr>
<tr>
<td>Ball handling for 10 m. with 90º turn to the left</td>
<td>3.5</td>
<td>3.15</td>
<td>0.000**</td>
</tr>
<tr>
<td>Ball handling for 20 m.</td>
<td>4.28</td>
<td>4.10</td>
<td>0.024*</td>
</tr>
<tr>
<td>Dribble - CODA (MAT) with ball.</td>
<td>10.15</td>
<td>9.50</td>
<td>0.007**</td>
</tr>
</tbody>
</table>

* p ≤ 0.05 / ** p ≤ 0.00

Regarding the different correlations made (table 6), the results are as follows:

- The jump strength correlates positively, and exclusively with the strength of the post-test jump. Likewise, the aerobic endurance (Course Navette or Beep test) only has positive effects when both of them do, i.e. improving one of them results in an improvement of the other.

- The speed for a distance of 10 m. with a 90º turn to the right correlates positively with the CODA without the ball in both tests.

- The post-test Speed for a distance of 10 m. with a 90º turn to the left without ball correlates positively with the Post-test Speed for a distance of 20 m. without ball and a highly significant correlation with the improvement of the dribble - CODA with ball.

- The Speed for a distance of 20 m. without the ball correlates very significantly with the ball handling for a distance of 20 m. in both tests.

- The post-test speed for a distance of 20 m. without ball correlates positively with the post-test speed for a distance of 10 m. without ball with a 90º turn.

- The Changes of direction (CODA) correlates very significantly with the speed for a distance of 10 m. with a 90º turn to the right and with the post-test CODA, without ball in all cases.

- The post-test changes of direction (CODA) correlates very significantly with the Speed for a distance of 10 m. with a turn to the right without the ball and with the pretest CODA without the ball. It is also significantly related to the speed for a distance of 10 m. with a right turn without ball.

- The ball handling for a distance of 10 m. with a right turn correlates very significantly with the handling for a distance of 20 m.

- The post-test ball handling for a distance of 10 m. with a 90º turn to the right correlates significantly with the dribble improvement - CODA with ball.
- Post-test Ball handling for a 10 m. distance with a 90° turn to the right correlates significantly with the dribble - CODA with ball.

- The Ball handling for a 10 m. distance with a 90° turn to the left correlates significantly with the ball handling for a 10 m. distance with a turn to the right during the post-test. It also correlates significantly with the post-test ball handling for a 20 m. distance and with the dribble - CODA with ball. On the other hand, it has a very significant correlation with the post-test ball handling for a distance of 20 m.

- The post-test ball handling for a distance of 10 m. with a 90° turn to the left presents a positive correlation with the post-test ball handling for a distance of 10 m. with a turn to the left. Likewise, it has a positive correlation with the post-test dribble – CODA with ball. However, it has a very significant correlation with the post-test ball handling for a distance of 20 m.

- The ball handling for a distance of 20 m. correlates significantly with the ball handling for a distance of 10 m. with a left turn and with the post-test dribble – CODA with ball. In spite of the foregoing, it correlates very significantly with the ball handling for a distance of 10 m. with a turn to the right, with the speed without ball for a distance of 20 m. and with the post-test ball handling for a distance of 20 m.

- The post-test ball handling for a distance of 20 m. is significantly related to the post-test dribble - CODA, and it is very significant with the pretest and post-test ball handling for a distance of 10 m. with a left turn, the speed for a distance of 20 m. without ball and with the ball handling for a distance of 20 m.

- Finally, the post-test dribble - CODA with ball correlates very significantly with the speed for a distance of 10 m. with a left turn, while it is significantly related to the ball handling for a distance of 10 m. with a post-test turn to the right and with a pretest turn to the left. It is also significantly related to the pretest and post-test ball handling for a distance of 20 m. and with the dribble - CODA.

### Table 6. Correlations by factors.

<table>
<thead>
<tr>
<th></th>
<th>Pearson correlation</th>
<th>Sig. (bilateral)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jump with both feet together</td>
<td>Post-test Jump with both feet tog.</td>
<td>0.951**</td>
</tr>
<tr>
<td>Course Navette or Beep Test</td>
<td>Post-test Course Navette or Beep T</td>
<td>0.959**</td>
</tr>
<tr>
<td>Speed for a distance of 10 m.</td>
<td>CODA without ball</td>
<td>0.777**</td>
</tr>
<tr>
<td></td>
<td>Post-test CODA without ball</td>
<td>0.727**</td>
</tr>
<tr>
<td>Post-test Speed for a distance</td>
<td>Post-test Speed for a distance of 20 m.</td>
<td>0.662*</td>
</tr>
<tr>
<td>10 m. with a 90° turn to the</td>
<td>without ball</td>
<td></td>
</tr>
<tr>
<td>left without ball</td>
<td>Post-test Regate - CODA (MAT) con balón</td>
<td>0.711**</td>
</tr>
<tr>
<td>Ball handling for 20 m.</td>
<td></td>
<td>0.881**</td>
</tr>
<tr>
<td>Speed for a distance of 20 m. without ball</td>
<td>Post-test ball handling for 20 m.</td>
<td>0.809**</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Post-test Speed for a distance of 20 m. without ball</td>
<td>Post-test Speed for a distance of 10 m. with a 90° turn to the left without ball</td>
<td>0.662*</td>
</tr>
<tr>
<td>CODA without ball</td>
<td>Speed for a distance of 10 m. with a 90° turn to the right without ball</td>
<td>0.777**</td>
</tr>
<tr>
<td></td>
<td>Post-test CODA without ball</td>
<td>0.973**</td>
</tr>
<tr>
<td>Post-test CODA without ball</td>
<td>Post-test Speed for a distance of 10 m. with a 90° turn to the right without ball</td>
<td>0.727**</td>
</tr>
<tr>
<td></td>
<td>Speed for a distance of 10 m. with a 90° turn to the right without ball</td>
<td>0.616*</td>
</tr>
<tr>
<td></td>
<td>CODA without ball</td>
<td>0.973**</td>
</tr>
<tr>
<td>Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>Ball handling for 20 m.</td>
<td>0.752**</td>
</tr>
<tr>
<td>Post-test ball handling for a distance of 10 m. with a 90° to the right</td>
<td>Post-test Dribble – CODA (MAT) with ball</td>
<td>0.646*</td>
</tr>
<tr>
<td>Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>Post-test Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>0.693*</td>
</tr>
<tr>
<td></td>
<td>Ball handling for 20 m.</td>
<td>0.644*</td>
</tr>
<tr>
<td></td>
<td>Post-test Ball handling for a distance of 20 m.</td>
<td>0.792**</td>
</tr>
<tr>
<td></td>
<td>Post-test Dribble – CODA (MAT) with ball</td>
<td>0.669*</td>
</tr>
<tr>
<td>Post-test Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>0.693*</td>
</tr>
<tr>
<td></td>
<td>Post-test Ball handling for a distance of 20 m.</td>
<td>0.708**</td>
</tr>
<tr>
<td></td>
<td>Post-test Dribble – CODA (MAT) with ball</td>
<td>0.695*</td>
</tr>
<tr>
<td>Ball handling for a distance of 20 m.</td>
<td>Ball handling for a distance of 10 m. with a 90° to the right</td>
<td>0.752**</td>
</tr>
<tr>
<td></td>
<td>Ball handling for a distance of 10 m. with a 90° to the left</td>
<td>0.644*</td>
</tr>
<tr>
<td></td>
<td>Speed for a distance of 20 m. without ball</td>
<td>0.881**</td>
</tr>
<tr>
<td></td>
<td>Post-test Ball handling for a distance of 20 m.</td>
<td>0.855**</td>
</tr>
<tr>
<td></td>
<td>Post-test Dribble – CODA (MAT) with ball</td>
<td>0.602*</td>
</tr>
<tr>
<td>Post-test ball handling for a distance of 20 m.</td>
<td>Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>0.792**</td>
</tr>
<tr>
<td></td>
<td>Post-test Ball handling for 10 m. with a 90° turn to the left</td>
<td>0.708**</td>
</tr>
<tr>
<td></td>
<td>Speed for a distance of 20 m. without ball</td>
<td>0.809**</td>
</tr>
<tr>
<td></td>
<td>Ball handling for a distance of 20 m.</td>
<td>0.855**</td>
</tr>
<tr>
<td></td>
<td>Post-test Dribble – CODA (MAT) with ball</td>
<td>0.630*</td>
</tr>
<tr>
<td>Post-test Dribble – CODA (MAT) with ball</td>
<td>Post-test Speed for a distance of 10 m. to the left without ball</td>
<td>0.711**</td>
</tr>
<tr>
<td></td>
<td>Post-test Ball handling for a distance of 10 m. with a 90° turn to the right</td>
<td>0.646*</td>
</tr>
<tr>
<td></td>
<td>Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>0.669*</td>
</tr>
<tr>
<td></td>
<td>Post-test Ball handling for a distance of 10 m. with a 90° turn to the left</td>
<td>0.695*</td>
</tr>
</tbody>
</table>
**The correlation is significant at the 0.01 level (bilateral).**

* The correlation is significant at the 0.05 level (bilateral).

### 4 DISCUSIÓN

El propósito de la investigación es analizar los efectos de juegos reducidos específicos en fútbol sobre la condición física y técnica de un grupo de jugadoras de fútbol, utilizando un programa de entrenamiento con 14 sesiones de tareas en situaciones de tres contra tres y cuatro contra cuatro.

Los resultados muestran que hay un mejoramiento de todas las variables analizadas, excepto la velocidad en una distancia de 20 m. sin la pelota. Por lo tanto, la fuerza de las piernas, la resistencia aeróbica, la agilidad y la velocidad con y sin la pelota generalmente se han mejorado. Estas data concuerdan con los resultados de Sánchez et al. (2014), pero para la población masculina. Por lo tanto, el mismo efecto ocurre en la resistencia aeróbica, la agilidad y la velocidad independientemente del género de los sujetos de esta edad. También coincide con los estudios de Craig et al. (2014) y Halouani, Chtourou, Dellal, Chaouachi y Chamari (2014) respecto al mejoramiento de la resistencia aeróbica. Sin embargo, no coinciden con los resultados de Sánchez et al. (2014) en la fuerza de las piernas ya que en nuestro estudio presentan mejoramiento en las promedios. En todo caso, estamos de acuerdo con el estudio llevado a cabo por Sánchez et al. (2014) respecto a las diferencias significativas después de la intervención y en este respecto, hay en realidad una coincidencia en la resistencia aeróbica y agilidad (CODA).

Respecto a las variables técnicas en esta investigación, coinciden con las analizadas por Pérez, et al (2012), Sánchez et al. (2014) y Soto y Pérez (2014b) en el mejoramiento de balonmano y dribling. No solo por su mejoramiento en los promedios, sino también por la existencia de diferencias significativas.

En otros estudios, el uso de SSGs es adecuado, útil, efectivo y contextualizado a la realidad del juego y la competencia (Craig, Andrew, Nicholas & Taisuke, 2014; Halouani et al., 2014; Pérez, et al., 2012; Sánchez, et al., 2016; Wein, 1995), siendo una alternativa a un entrenamiento tradicional y comprometido donde el entrenamiento se separa de la realidad del juego sin tenerlo en cuenta (Casamichana et al., 2015; Rampinini, et al., 2007; Sánchez, et al., 2016), y de hecho, es esta alternativa transferible a las situaciones competitivas específicas (Casamichana et al., 2015).

Una vez más, los datos coinciden con los expuestos por Febré, et al. (2015), Katis y Kellis (2009) y Sánchez et al., (2014) cuando señalan la importancia de este tipo de programas que deben ser destinados a mejorar la condición física y técnica en la población prepuberal de mujeres. A su vez, coinciden con los estudios de Craig et al. (2014) y Sánchez, et al. (2014) al señalar la importancia de este tipo de entrenamientos que son...
suitable for young athletes since most of the scientific publications focus on the adult population. They can help prepare players with better thinking and decision-making skills in different situations (Cristian, et al., 2015, Martínez, et al., 2015, Young & Rogers, 2104).

This work is not related to the results obtained by Castillo, Fernández, Cinchilla and Álvarez (2012) which show a correlation between the strength of vertical jump and the CODA, aspect that in our study does not have that correlation as in the study of Pardeiro and Yanci (2017), although it is true that their research focuses on professional and semi-professional players respectively, and in our case, we focus on players in training and with different strength physical levels, since they have not yet developed their full strength. In the same way, it is related to the objective results in the study by Yanci et al (2013) and Yanci, et al. (2014), because the speed over short spaces is related to the agility of MAT or CODA, as well as to the study by Arin, Jansson and Skarphagen (2012) that show a significant correlation with values of similar significance, between the speed for a distance of 10. and 20 m. with the CODA test, although, of course, the samples are totally different. Finally, it is related to the study made by Yanci, et al. (2016) in a similar sample of age, but in a completely different sport: athletics. Finally, it is related to the study carried out by Young and Rogers (2014), when they both determine that reduced games improve the performance of agility.

Our study is related to the data obtained by Yanci et al (2013), in which the high variability produces improvements in changes of direction (CODA) and in the linear speed, as it also happens in our case since it significantly improves the changes of direction and the linear speed with the application of the training programme based on SSGs.

It is not possible to relate the research carried out with other researches that focus on a population subject of a similar study, and which shows that the improvement of speed and ball handling for a distance of 10 m. with a 90° turn is significantly related to the improvement of changes in direction - CODA with and without the ball, being these key aspects in the game of football as indicated by several studies (Bangsbo, et al., 2006; Yanci, et al., 2014).

Finally, it would be very interesting to carry out more studies where these results are analysed in comparison with different categories of exclusively women's football, and of course, it would be striking to compare them to the male population, both with training programmes based on SSGs and with other types of training programmes.

5 CONCLUSIONS

The results obtained show that the physical condition, the technique and the CODA of the female football players have been improved through a training programme in SSGs. The aerobic endurance, the speed, the agility, the technique of ball handling and the changes of direction (CODA) are all improved within a specific training environment, being all of them the conditions and
qualities necessary to play football. However, the explosive force is not improved significantly in a sample of prepubescent female football players.

The improvement of the linear speed, the speed and the ball handling with changes of direction improve quite a lot the changes of direction - CODA and the dribble - CODA, both specific aspects and highly related to the performance in football. Therefore, the training of these aspects is highly recommended in these ages to provoke a better current and future performance in football.

Consequently, the implementation of a training programme composed of 14 sessions in which football reduced games or SSGs are included, can be used with young female players in order to improve some physical qualities, the changes of direction - CODA and their own specific technical aspects of football, such as ball handling and dribbling. Being the acquired learning transferable to real situations of the game. Thus, we can consider that they are an appropriate and very advantageous method for training in the initial stages or for training in female football players.

6 REFERENCES


Número de citas totales / Total referentes: 50 (100%)
Número de citas propias de la revista / Journal’s own referentes: 2 (4%)