

BEACH HANDBALL EUROPEAN CHAMPIONSHIPS ANALYSIS ZAGREB 2017

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INTRODUCTION

Beach handball continues its unstoppable growth and there is increasingly more talk about its possible inclusion as an Olympic sport in the absolute category. The under-18 have already done so and beach handball will have its first appearance in the Youth Olympic Games in October 2018 in the city of Buenos Aires. One of the last samples of beach handball level could be seen in the last European championships of national teams played in Zagreb. Both in the absolute category and in the under-17 category. On this occasion, the tenth absolute category edition and the eighth edition of the young category were held.

In general, and evaluating the four categories at the same time, we could evaluate the European championships very positively. We would highlight that the overall speed of the game has increased and that the technical quality of all the players continues to grow to a great extent. The younger ones are a clear example of this. One of the reasons may be that these generations are learning at the same time the specific technical skills of handball and beach handball.

Before starting with the specific study of the statistical results of these European Championships of national teams, we will review the different analyses of the previous championships played to date.

The European Championships of absolute teams began in 2000 in the city of Gaeta, Italy. Then, everything was very different from now and even some goalkeepers played with long-sleeved shirts when temperatures reached 30 degrees. Sixteen national teams, eight per gender, were part of this first European championship. Belarus, in the men's category, and Ukraine, in the women's category, were victorious.

In Cádiz, Spain, in 2002, the second European beach handball team took place and the first analysis of the championship was carried out (Guerrero & Van Linder, 2002). One of the highlights by Guerrero and Van Linder (2002) was the high presence of spectators to this championship. The court, with capacity for 3.500 people, was small. Thirty-two teams participated (16 per gender) and it was the first championship in which, in addition to the flight, the spin-shot also had a value of two points. Since then, the strategies of the game changed completely. The analysis by Guerrero and Van Linder (2002) did not present any study of effectiveness but it did of the defensive and offensive systems. The fast break had its three phases very marked. First, goalkeeper direct throw; second, move to the attack area to finish before the defense was organized; third, with the entrance of the specialist. Some national teams, such as the Spanish male one, tried to exploit them all. As for the offensive systems, the teams based their strategies on the goalkeeper's and the wings' ball fixings. In some cases, the goalkeeper was also used to make fixings without the ball. Most teams used defensive systems with little depth with 3:0 structures. The exception was marked by the men's category

champion, Spain, who used the "triangle-formation (2-1)" (Guerrero & Van Linder, 2002) and the pressure before the goal throw.

The third European championship was played in Alanya (Turkey). On this occasion, the analysis of the championship (Guerrero & Van Linder, 2004) also included an anthropometric analysis. The average height in men was 187 cm and in women, 175 cm. The weight in men was 86 kg and 69 kg in women. The importance of the shoot out was highlighted, 25% of the matches ended with this tie-break system. This analysis (Guerrero & Van Linder, 2004) collected, among other data, releases and fast breaks. Women had an efficiency of 59% in the 1-point throws, 56% in the 2-point throws, 70% in the 6-metre throw and 56% in the goalkeeper throws from their own goal. The statistics did not differentiate the specialist's throw in the organized attack phase. Men achieved 48% of effectiveness in 1-point throws, 55% in 2 point-throws, 70% in 6-metre throws and 32% in goalkeeper direct throws. It also picked up the effectiveness of the fast break: women had an effectiveness of 57% (12/21 throws) and men of 68% (40/59). Another aspect highlighted in another subsequent analysis (Van Linder, Gehrer, & Trespidi, 2004) was that the teams' performance improvement was based more on individual technical improvement than on the improvement of collective tactics.

In 2006, the fourth National Teams European Championship was organized in Cuxhaven, Germany. In the analysis, Gerher, Trespidi and Bebetos (2006) showed that 80% of the points of the matches were 2 point-goals, 36% of the 2 point-goals were scored by the specialist, 34% of these goals were achieved by the spin shot, 20% in-flight and 10% by 6-metre throw. In the analysis discussion (Gehrer et al., 2006), the authors show concern about the reduction in the number of flight throws and the low variability of the spin shot release, which, according to them, leads to a lower spectacularity of the game. Also, they say that the number of teams that made the defensive pressure in the goalkeeper's serve increased as well as the use of defenses 2:1, with greater attention in the specialist player. Among the highlighted aspects were the appearance of counter-rotations and combinations of spin shot, in-flight and specialist.

The fifth European Championship was played in Misano Adriatico (Italy) in 2007 and it stood out due to the great presence of live spectators and the excellent television coverage carried out by SKY and Eurosport (Gehrer & Trespidi, 2007). In this championship, there was nothing remarkable in terms of the evolution of the game. The equality in the game level of the teams shown in the number of games that used the shoot out to break the tie should be emphasized (58 out of 188 matches played), especially in the matches fighting for medals (7 out of 8).

From here, Larvik (Norway) 2009, Umag (Croatia) 2011, Randers (Denmark) 2013 and Lloret de Mar (Spain) 2015, complete the list of the nine senior European Championship played before the one being analyzed. Based on our personal experience, we can say that beach handball has evolved professionally throughout these last mentioned championships. This professionalization is understood as a greater number of hours dedicated exclusively to beach handball. This greater professionalism, in our opinion, has contributed an improvement in the individual technique, an increase in the coaches' collective tactics, a greater specialization in the specific positions of beach handball, and a better specific physical condition adapted to the soft sand. Next, we will explain how this is reflected in the following analyzes.

In Kuburovic's analysis about Larvik, Norway (Kuburovic, 2009), we can see the first references to the 4:0 offensive system used by the Hungarian team. The most used offensive system continues to be 3:1 with the specialist placed in the center of the attack. In defense, the same

systems are maintained as in previous championships: 3:0 and 2:1 on the specialist. Among Kuburovic's conclusions (Kuburovic, 2009) we pointed out that in order to be a champion team you need to have the following characteristics: a good goalkeeper, a specialist with powerful shot and fantastic assists capacity, a tall pivot, wing players that shoot pirouette and jump high, a tall and fast defensive specialist in the middle and two block oriented wing defensive players. Who would not want a team like that?

Umag, in 2011, showed a great change in terms of increase of offensive combinations variants and the high level of play both in men's and in women's categories (Tezcan, 2011). Regarding the morphological analysis, we can find an average height in men of 188 cm and of 174 cm in women; in the weight, men had an average weight of 87 kg and the women of the 67 kg.

The analysis of the European Championship in Randers (Tezcan, 2013b) is, in our opinion, the best analysis of the European Championships held so far. It summarizes all the relevant data of all European championships from previous selections, including, of course, one in question. The first aspect to highlight is the anthropometric analysis. In men, there is an average height of 192 cm and of 178 cm in women, and an average weight in men of 81 kg and 64 kg in women. Also, an analysis of the average points per match in all the senior European championships played until then can be observed. In men, the evolution from Gaeta to Randers was 32.61, 56.53, 62.64, 65.96, 76.20, 77.39, 73.83 and 77.86; and in the women participating in Randers was 45.19, 48.10, 46.13, 49.05, 57.36, 57.65, 58.68 and 61.42. Another interesting fact is the percentage of the number of games that ended up breaking by the shoot out from the first European. The percentage from the European of 2000 and until 2013 is the following: 37.5%, 30.0%, 39.5%, 31.5%, 34.0%, 31.5%, 35.5% and 35%. Figure 1 and figure 2, taken from Tezcan (2013), brilliantly summarize the throw types of the European Championships in 2009, 2011 and 2013.

M	2009 Echs				2011 Echs				2013 Echs			
	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals
TOTAL	1819	3267	55,68		2472	4384	56,39		2729	4519	60,39	
INF	89	159	55,97	4,89%	150	289	51,90	6,07%	487	806	60,42	17,85%
SPS	675	1430	47,20	37,11%	1137	2098	54,19	46,00%	1135	2034	55,80	41,59%
SPE	373	700	53,29	20,51%	448	946	47,36	18,12%	543	940	57,77	19,90%
DIG	38	120	31,67	2,09%	56	136	41,18	2,27%	43	95	45,26	1,58%
OSG	477	652	73,16	26,22%	490	670	73,13	19,82%	319	382	83,51	11,69%
P6M	167	206	81,07	9,18%	191	245	77,96	7,73%	202	262	77,10	7,40%

Figure 1. Data collection in relation to the types of men's throws in the European Championships of 2009, 2011 and 2013 (Tezcan, 2013)

W	2009 Echs				2011 Echs				2013 Echs			
	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals
TOTAL	2180	3500	62,29		2990	4935	60,59		2257	4221	53,47	
INF	345	491	70,26	15,83%	545	830	65,66	18,23%	122	232	52,59	5,41%
SPS	861	1560	55,19	39,50%	1212	2139	56,66	40,54%	1003	2055	48,81	44,44%
SPE	474	785	60,38	21,74%	626	1122	55,79	20,94%	441	1005	43,88	19,54%
DIG	77	136	56,62	3,53%	62	132	46,97	2,07%	45	104	43,27	1,99%
OSG	224	274	81,75	10,28%	380	498	76,31	12,71%	460	578	79,58	20,38%
P6M	202	254	79,53	9,27%	165	214	77,10	5,52%	186	247	75,30	8,24%

Figure 2. Data collection in relation to the types of women's throws in the European Championships of 2009, 2011 and 2013 (Tezcan, 2013)

In relation to the European championships of youth national teams, as we mentioned at the beginning of this analysis, up to 2017 eight European championships of national teams have

been organized. Three Under-19s (Umag, Croatia, 2011; Randers, Denmark, 2013; and Lloret de Mar, Spain, 2015); three Under-18s (Nagyatad, Hungary, 2008; Batumi, Georgia, 2012; and Lorca, Spain, 2014); one Under-17s (Umag, Croatia, 2017), and one Under-16s (Nazareth, Portugal, 2016).

Among the information found in the literature reviews about the European Youth Championships, we set out to present two analyzes. The first article reviewed is that of the European Under-19 Championship held in Randers in 2013 (Tezcan, 2013a). In this analysis, we find again anthropometric data of the selections, in this case of Under-19s. Men had an average height of 185 cm and the women of 173 cm. Regarding weight, men had an average of 81 kg and women of 64 kg. Also, an analysis of the average points per match of all the European base championships played until then can be observed. In men, the evolution from Nagyatad to Randers was 70.17, 68.16, 67.41 and 70.34; and in women it was 52.50, 58.75, 59.41 and 72.89. In women, the change in the annotation was clearly significant. Another aspect to be highlighted in this analysis is the excellent data collection in relation to the throw rates of all the European youth championships played so far (figure 3 and figure 4).

W	2008 Echs				2011 Echs				2012 Echs				2013 Echs			
	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals
TOTAL	689	1170	58,89		1158	2036	56,88		851	1411	60,31		1217	2206	55,17	
INF	23	36	63,89	3,34%	42	90	46,67	3,63%	80	129	62,02	9,40%	252	434	58,06	20,71%
SPS	161	309	52,10	23,37%	480	921	52,12	41,45%	447	767	58,28	52,53%	426	884	48,19	35,00%
SPE	146	286	51,05	21,19%	212	445	47,64	18,31%	154	276	55,80	18,10%	239	468	51,07	19,64%
DIG	16	40	40,00	2,32%	30	59	50,85	2,59%	14	20	70,00	1,65%	27	79	34,18	2,22%
OSG	302	444	68,02	43,83%	297	408	72,79	25,65%	97	141	68,79	11,40%	183	225	81,33	15,04%
P6M	41	55	74,55	5,95%	103	122	84,43	8,89%	59	78	75,64	6,93%	90	116	77,59	7,40%

Figure 3. Data compilation in relation to the types of women's throw in the European Youth Championships held in 2008, 2011, 2012 and 2013 (Tezcan, 2013)

M	2008 Echs				2011 Echs				2012 Echs				2013 Echs			
	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals	GOAL	ATTEMPT	%	% in all goals
TOTAL	923	1481	62,32		1230	2103	58,49		819	1323	61,90		1121	1972	56,85	
INF	135	184	73,37	14,63%	170	272	62,50	13,82%	30	42	71,43	3,66%	31	59	52,54	2,77%
SPS	425	688	61,77	46,05%	518	963	53,79	42,11%	342	573	59,69	41,76%	531	1026	51,75	47,37%
SPE	204	368	55,43	22,10%	272	495	54,95	22,11%	146	259	56,37	17,83%	245	475	51,58	21,86%
DIG	9	34	26,47	0,98%	17	47	36,17	1,38%	16	32	50,00	1,95%	201	255	78,82	17,93%
OSG	103	142	72,54	11,16%	158	205	77,07	12,85%	242	364	66,48	29,55%	34	64	53,13	3,03%
P6M	47	65	72,31	5,09%	95	121	78,51	7,72%	43	53	81,13	5,25%	79	93	84,95	7,05%

Figure 4. Data compilation in relation to the types of men's throw of the European Youth Championships held in 2008, 2011, 2012 and 2013 (Tezcan, 2013)

The second analysis of European Youth Championship chosen is Gehrer's (2016) in Nazareth 2016. In this sense, the most relevant data that meet the study we are carrying out are effectiveness percentages. The men are 85% effective in 1-point shot, 53% in spin shot, 64% in inflight, 58% in specialist throw, 45% in goalkeeper throw, 72% in 6-meter throw and 59 % in total efficiency. Women are 79% effective in 1-point shot, 47% in spin shot, 54% in inflight, 53% in specialist throw, 27% in goalkeeper throw, 81% in 6-meter throw and 54 % in total effectiveness.

After the review of all the European beach handball championships carried out in this introduction, we aim to make a quantitative assessment and, to the extent possible, qualitative, of all the collected data during all the matches of the different categories.

In this sense, in the quantitative statistical analysis we will try to make an assessment that meets the quality standards of scientific nature. This has not been done to date in this type of analysis but we believe that this is essential so the conclusions we transmit about this study can be based on scientific criteria.

METHOD

The data collection for the quantitative analysis was carried out in situ by volunteers selected for this purpose. These volunteers received training a week before the start of the championship. This training was given by European Handball Federation staff. In each match, the volunteers were accompanied by a Federative Delegate who narrated the different actions that were being carried out.

All collected data were transferred to a spreadsheet to be treated with the SPSS v.22 software afterwards. The normality of the dependent variables was checked by the asymmetry and kurtosis tests, resulting in normal variables. The contrasts of mean differences between gender and category variables were studied by means of multivariate analysis of covariance. When the variables did not show significant differences and their degree of association was close to zero, they were studied as a single group. The rest of the variables were studied as independent groups. Subsequently, a descriptive and inferential analysis among the variables of the study was carried out. In the inferential analysis, when the variance homogeneity test showed significance, the Welch test was used; when it did not show significance, the ANOVA test was used.

In the inferential quantitative analysis, firstly, a comparison of the throws and saves was made based on the position of each team in the final ranking. The variables absolute category and under-17 were treated as a single group, since the covariance tests showed no significance and their degree of association was close to zero. In this way, the variables inflight shot, goalkeeper throw and 6-metre throw were treated. With this result, we increased the size of the sample and the analysis reached greater power. The variables one-point shot, spin shot, specialist throw and total throw were treated as independent variables, since the study of the covariance showed significance. Secondly, a comparison of the throws and saves was made based on the following grouping of the final classification: finalists, fourth finalists and eighth finalists.

The data collection for the qualitative analysis was carried out a posteriori using the matches recorded by the organization during the championship. This qualitative analysis has not followed the criteria of scientific quality. Despite this, we decided to include it since we believed that this type of analysis could be a demand from potential readers of this type of work. Future investigations of this type of analysis should follow the criteria described in the work of Morillo, Reigal and Hernández-Mendo (2015).

RESULTS

Descriptive and inferential analysis according to throw type, saves, shoot out when categories are compared

The European beach handball championships of the absolute and under-17 categories were organized at the beach handball facilities of Jarun Lake in Zagreb, Croatia, in 2017. The absolute championship was organized between June 20 and 25, and the under-17 championship between June 16 and 18. In the male absolute category, 14 teams were registered, 15 in the women's category, 15 in the male under-17s, and 12 in the female under-

17s. Five hundred fifty-seven players from 21 countries participated. Table 1 shows the means of the basic anthropometric data of the players.

Table 1. Anthropometric data players

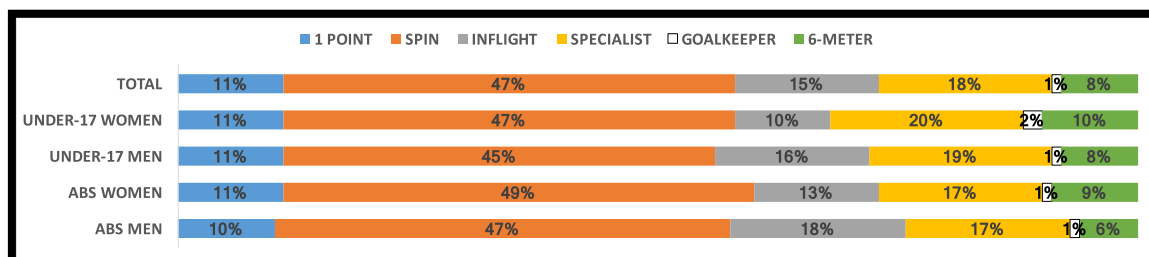
Category	Height			Weight		
	Maximum	Minimum	Average	Maximum	Minimum	Average
Under-17s women	188 cm	160 cm	172,4 cm	94 kg	47 kg	63,2 kg
Under-17s men	201 cm	156 cm	182,5 cm	102 kg	45 kg	72,0 kg
Absolute women	198 cm	161 cm	175,8 cm	96 kg	55 kg	68,5 kg
Absolute men	210 cm	175 cm	191,5 cm	112 kg	68 kg	90,4 kg

A total of 189 matches were played in four fields of play: 49 in each of the categories absolute male, absolute female and under-17s male; and 42 in the under-17s female category. The final classifications of all the categories can be seen in figure 5.



Figure 5. Rankings of the all categories (extracted from www.eurohandball.com)

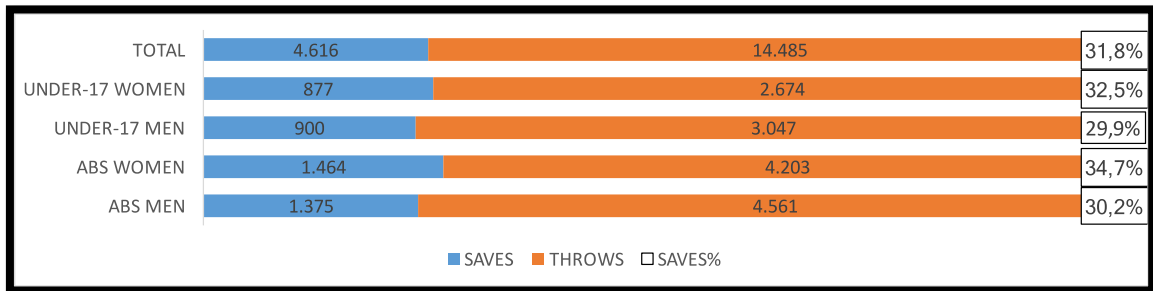
In the 189 matches played, a total of 9.805 goals were scored, of which 1.046 were 1-point goals, 4.652 goals were the spin shots, 1.442 were inflight shots, 1.753 were specialist shot, 127 were goalkeeper throw and 775 from 6-metre throw. There were 617 suspensions, 64 disqualifications by accumulation and 15 direct disqualifications. Fourteen thousand four hundred eighty-five throws were carried out and the goalkeepers saved 4.619 throws, which leads to a total percentage of saves of 31.8%. It must be borne in mind that saves are also included in the direct blocks and the blocks of the counter-spin. Figure 1 shows all the previous total data and by categories expressed in percentages.



Graphic 1. Total categories goal according to throw type

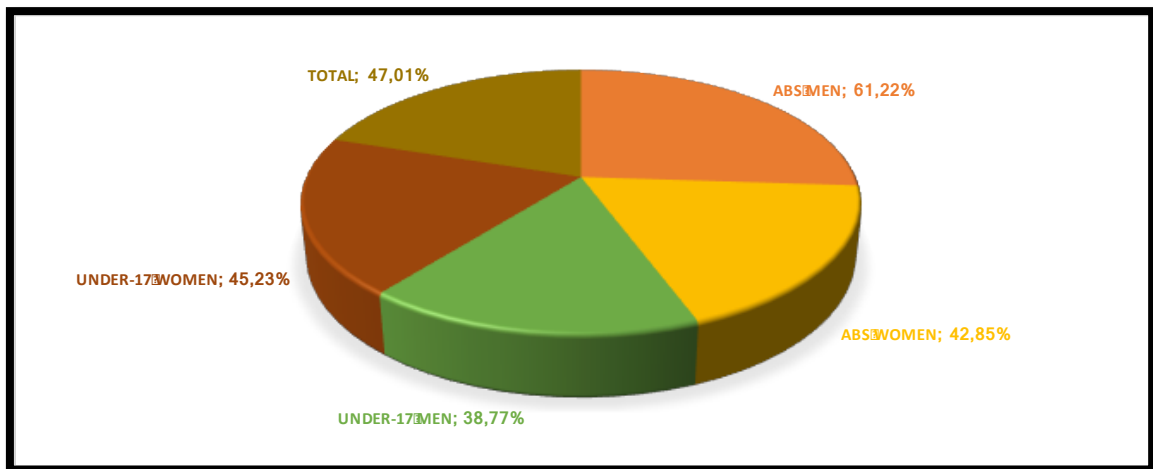
We cannot conclude that there exist statistically significant differences in goal according to throw type when the categories are compared, apart from in inflight throw were we found statistically significant differences ($p < ,05$).

Graphic 2 shows the number of saves, the total number of throws and the save percentages. We cannot conclude that there exist statistically significant differences in saves when the categories are compared.



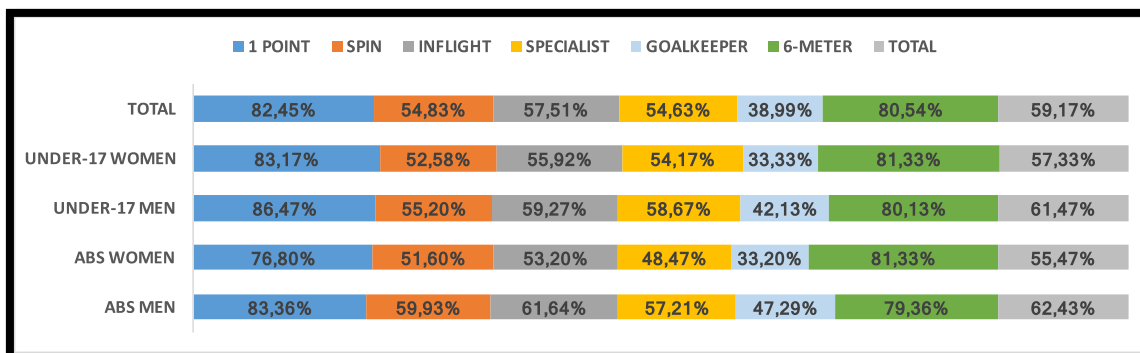
Graphic 2. Number of saves, total number of throws, save percentages

Graphic 3 shows the shoot out percentages when the categories are compared. We can conclude that there exist statistically significant differences ($p < ,001$) in shoot out when the categories are compared. Absolute male is the category with more shoot outs played (30 shoot outs in 49 matches).



Graphic 3. Shoot out percentages according to categories

Graphic 4 shows effectiveness percentage according to throw type when the categories are compared. There exist statistically significant differences in the spin shot ($p < ,05$), in the specialist shot ($p < ,05$) and in the total effectiveness ($p < ,01$). We cannot conclude that there are differences in the one-point shot ($p = ,115$), in the inflight shot ($p = ,292$), in the goalkeeper shot ($p = ,265$) and the 6-metre throw ($p = ,974$).



Graphic 4. Effectiveness percentage according to throw type when categories are compared

Effectiveness according to the throw type and saves effectiveness

Table 2 shows a comparison of the effectiveness percentage between men and women according to the throw type and the goalkeeper saves. There exist statistically significant differences with greater effectiveness percentage for men in the one-point shot ($p < .05$), in the spin shot ($p < .01$), in the specialist shot ($p < .05$) and in the total effectiveness ($p < .01$). The goalkeepers are more effective in their actions and the differences are statistically significant. We cannot say that there are differences in the inflight shot ($p = .498$), in the goalkeeper shot ($p = .066$) and the 6-metre throw ($p = .604$).

Table 2. Effectiveness comparison of the throws and saves between genders

	Gender	N	Effectiveness Average %	SD	SE	p	η^2
1E%	Male	29	84,966	9,9982	1,8566	,013*	,048
	Female	27	79,630	11,9555	2,3008		
SsE%	Male	29	57,483	8,3222	1,5454	,006*	,149
	Female	27	52,037	6,9142	1,3306		
FE%	Male	28	62,571	8,4214	1,5915	,498	,010
	Female	25	58,760	11,9697	2,3939		
SE%	Male	29	57,966	8,3044	1,5421	,023*	,106
	Female	27	51,000	10,2769	1,9778		
GE%	Male	26	49,769	31,3002	6,1385	,066	,070
	Female	26	34,538	23,7558	4,6589		
6mE%	Male	29	79,759	12,8804	2,3918	,604	,006
	Female	27	81,333	13,1792	2,5363		
TE%	Male	29	61,931	5,2094	,9674	,003*	,178
	Female	27	56,296	6,6496	1,2797		
Saves %	Male	29	30,034	5,0884	,9449	,012*	,128
	Female	27	33,704	5,4123	1,0416		

1E%: 1-point shot effectiveness; SsE%: spin shot effectiveness; FE%: inflight shot effectiveness; SE%: specialist shot effectiveness; GE%: goalkeeper shot effectiveness; 6mE%: 6-meter throw effectiveness; TE%: total throws effectiveness; Saves %: saves effectiveness; *: statistical differences

Table 3 shows a comparison of the effectiveness percentage between absolute male and under-17s male according to the throw type and the goalkeeper saves. We cannot conclude that there exist significant differences in the throws effectiveness percentage and saves effectiveness of these groups.

Table 3. Effectiveness comparison of the throws and saves between male categories

	Category	N	Effectiveness Average %	SD	SE	p	η ²
1E%	ABS Male	14	83,357	8,4454	2,2571	,529	,017
	U17 Male	15	86,467	11,3444	2,9291		
SsE%	ABS Male	14	59,929	5,3847	1,4391	,134	,095
	U17 Male	15	55,200	10,0014	2,5824		
FE%	ABS Male	14	61,643	6,8793	1,8386	,975	,000
	U17 Male	14	63,500	9,9053	2,6473		
SE%	ABS Male	14	57,214	6,9523	1,8581	,641	,010
	U17 Male	15	58,667	9,5892	2,4759		
GE%	ABS Male	14	47,286	26,7594	7,1518	,757	,004
	U17 Male	12	52,667	36,9233	10,6589		
6mE%	ABS Male	14	79,357	9,3612	2,5019	,961	,000
	U17 Male	15	80,133	15,8153	4,0835		
TE%	ABS Male	14	62,429	4,0328	1,0778	,282	,050
	U17 Male	15	61,467	6,2205	1,6061		
Saves %	ABS Male	14	30,214	3,5340	,9445	,804	,003
	U17 Male	15	29,867	6,3343	1,6355		

1E%: 1 point shot effectiveness; SsE%: spin shot effectiveness; FE%: inflight shot effectiveness; SE%: specialist shot effectiveness; GE%: goalkeeper shot effectiveness; 6mE%: 6-meter throw effectiveness; TE%: total throws effectiveness; Saves %: saves effectiveness; *: statistical differences

Table 4 shows a comparison of the effectiveness percentage between absolute female and under-17s female according to the throw type and the goalkeeper saves. We cannot conclude that there exist significant differences in the throw effectiveness percentage and saves effectiveness of these groups.

Table 4. Effectiveness comparison between female categories of the throws and saves

	Category	N	Effectiveness Average %	SD	SE	p	η ²
1E%	ABS Female	15	76,800	12,6559	3,2677	,504	,021
	U17 Female	12	83,167	10,4606	3,0197		
SsE%	ABS Female	15	51,600	6,0451	1,5608	,140	,096
	U17 Female	12	52,583	8,1180	2,3435		
FE%	ABS Female	13	61,385	10,6265	2,9473	,446	,027
	U17 Female	12	55,917	13,1319	3,7909		
SE%	ABS Female	15	48,467	10,0205	2,5873	,018	,228
	U17 Female	12	54,167	10,1070	2,9176		
GE%	ABS Female	15	33,200	21,3615	5,5155	,652	,009
	U17 Female	11	36,364	27,6705	8,3430		
6mE%	ABS Female	15	81,333	10,1817	2,6289	,956	,000
	U17 Female	12	81,333	16,6915	4,8184		
TE%	ABS Female	15	55,467	6,5994	1,7040	,083	,131
	U17 Female	12	57,333	6,8534	1,9784		
Saves %	ABS Female	15	34,667	4,4508	1,1492	,889	,001
	U17 Female	12	32,500	6,4173	1,8525		

1E%: 1-point shot effectiveness; SsE%: spin shot effectiveness; FE%: inflight shot effectiveness; SE%: specialist shot effectiveness; GE%: goalkeeper shot effectiveness; 6mE%: 6-metre throw effectiveness; TE%: total throws effectiveness; Saves %: saves effectiveness; *: statistical differences

One-point shot effectiveness, comparison according to the ranking

- **Men's category**

We cannot conclude that there exist significant differences ($p=,388$) in the effectiveness percentage of the one-point shot in men's category based on the ranking. In figure 5, we can

observe the success percentage and the position in the final ranking. It can be observed that there is not a tendency in relation to the position of the ranking.

- **Women's category**

We cannot conclude that there exist significant differences ($p=,426$) in the effectiveness percentage of the one-point shot in women's category based on the ranking. In figure 6, we can observe the success percentage and the position in the final ranking. It can be seen that there is not a tendency in relation to the position in the ranking.

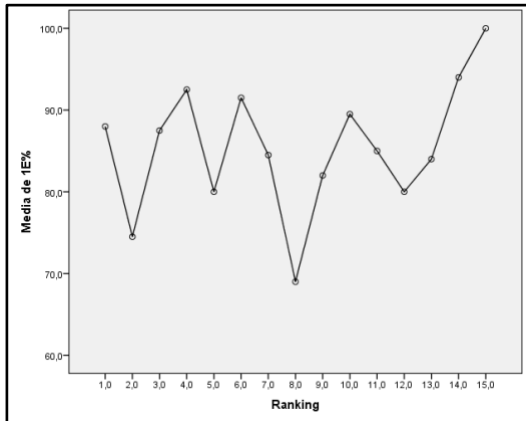


Figure 5. Relationship between the effectiveness percentage in the one-point shot in men's category and the position in the final ranking

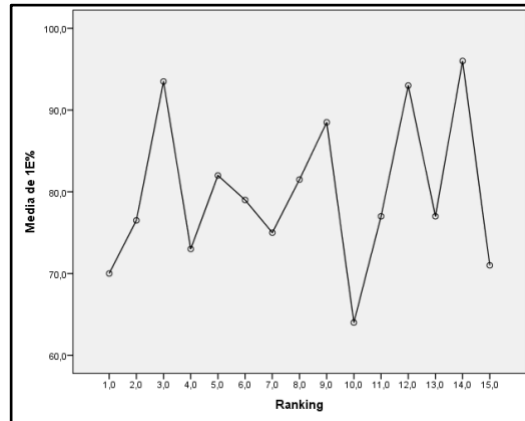


Figure 6. Relationship between the effectiveness percentage in the one-point shot in women's category and the position in the final ranking

Spin shot effectiveness, comparison according to the ranking

- **Men's category**

We cannot conclude that there exist significant differences ($p=,104$) in the effectiveness percentage of the spin shot in men's category based on the ranking. In figure 7, we can observe the success percentage and the position in the final ranking. It can be seen that there exist a tendency in relation to the position in the ranking.

- **Women's category**

There exist statistically significant differences ($p<,01$) in the effectiveness percentage of the spin shot in women's category based on the ranking. In figure 8, we can observe the success percentage and the position in the final ranking. It can be noticed that there is a tendency in relation to the position in the ranking.

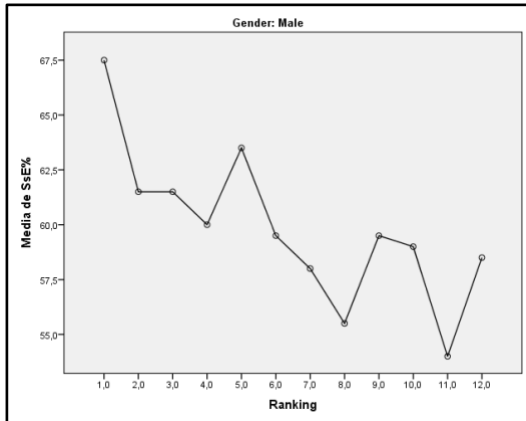


Figure 7. Relationship between the effectiveness percentage in the spin shot in men's category and the position in the final ranking

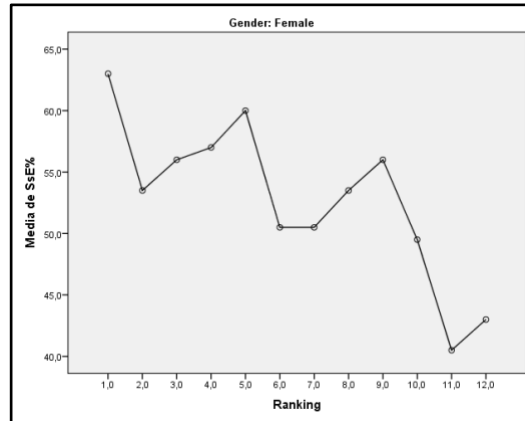


Figure 8. Relationship between the effectiveness percentage in the spin shot in women's category and the position in the final ranking

Inflight shot effectiveness, comparison according to the ranking

- **Men's and women's category**

We cannot conclude that there exist significant differences ($p=,441$) in the effectiveness percentage of the inflight shot in men's and women's category based on the ranking. In figure 9, we can observe the success percentage and the position in the final ranking. It can be noticed that there is not a tendency in relation to the position in the ranking.

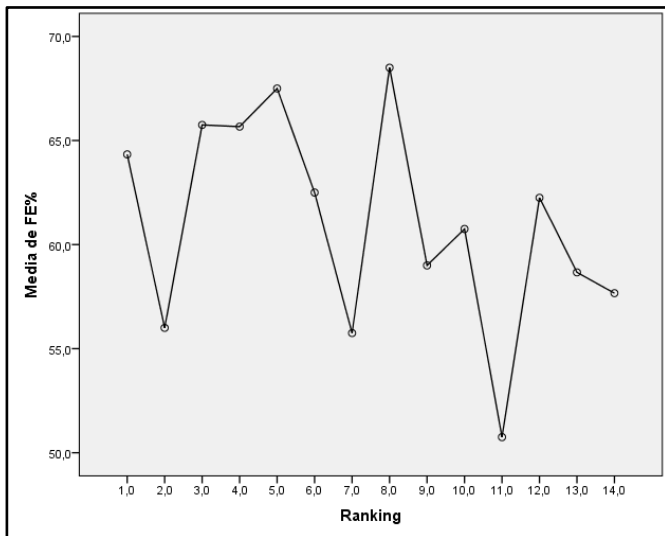


Figure 9. Relationship between the effectiveness percentage in the inflight shot in men's and women's category and the position in the final ranking

Specialist shot effectiveness, comparison according to the ranking

- **Men's category**

We cannot conclude that there exist significant differences ($p=,890$) in the effectiveness percentage of the specialist shot in men's category based on the ranking. In figure 10, we can notice the success percentage and the position in the final ranking. It can also be observed that there is not a tendency in relation to the position in the ranking.

- **Women´s category**

We cannot come to the conclusion that there exist significant differences ($p=,270$) in the effectiveness percentage of the specialist shot in women´s category based on the ranking. In figure 11, we can observe the success percentage and the position in the final ranking. It can also be seen that there exist a tendency in relation to the position in the ranking.

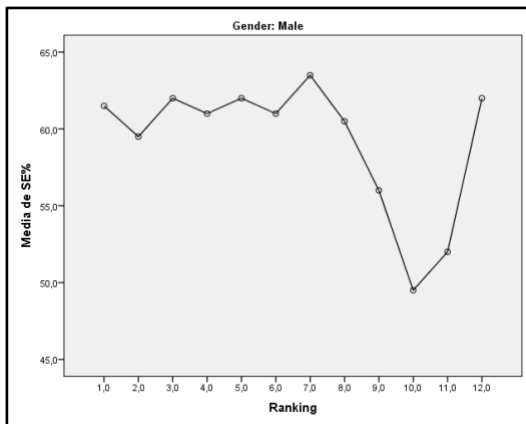


Figure 10. Relationship between the effectiveness percentage in the specialist shot in men´s category and the position in the final ranking

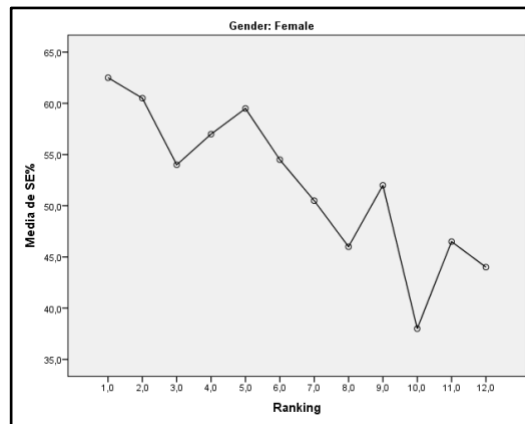


Figure 11. Relationship between the effectiveness percentage in the specialist shot in women´s category and the position in the final ranking

Goalkeeper shot effectiveness, comparison according to the ranking

- **Men´s and women´s category**

We cannot conclude that there exist significant differences ($p=,885$) in the effectiveness percentage of the goalkeeper shot in men´s and women´s category based on the ranking. In figure 12, we can observe the success percentage and the position in the final ranking. It can also be seen that there is not a tendency in relation to the position in the ranking.

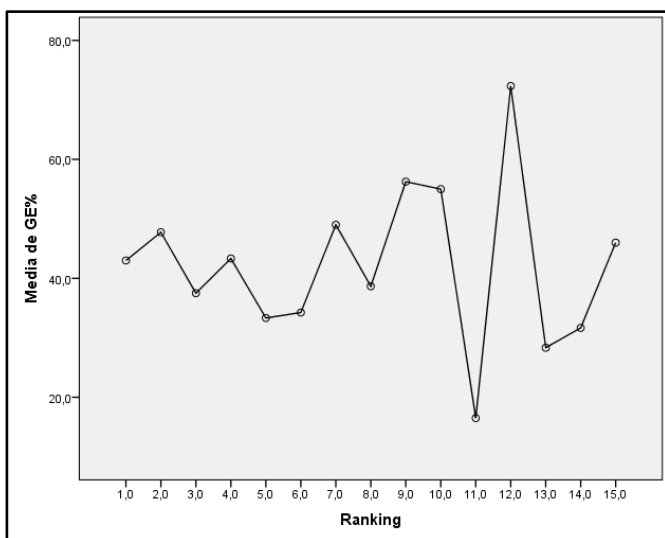


Figure 12. Relationship between the effectiveness percentage in the goalkeeper shot in men´s and women´s category and the position in the final ranking

6-meter throw effectiveness, comparison according to the ranking

- **Men's and women's category**

We cannot conclude that there exist significant differences ($p=,960$) in the effectiveness percentage of the 6-meter throw in men's and women's category based on the ranking. In figure 13, we can observe the success percentage and the position in the final ranking. It can also be noticed that there is not a tendency in relation to the position in the ranking.

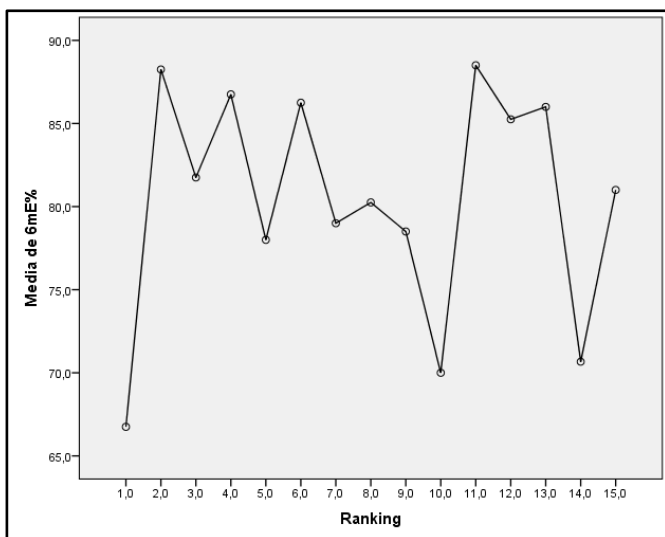


Figure 13. Relationship between the effectiveness percentage in the 6-meter throw in men's and women's category and the position in the final ranking

Total throws effectiveness, comparison according to the ranking

- **Men's category**

We cannot conclude that there exist significant differences ($p=,240$) in the effectiveness percentage of the total throws in men's category based on the ranking. In figure 14, we can observe the success percentage and the position in the final ranking. It can be seen that there exist a tendency in relation to the position in the ranking.

- **Women's category**

There exist statistically significant differences in the effectiveness ($p<,05$) percentage of total throws effectiveness in women's category based on the ranking. In figure 15, we can observe the success percentage and the position in the final ranking. It can also be noticed that there exist a tendency in relation to the position in the ranking.

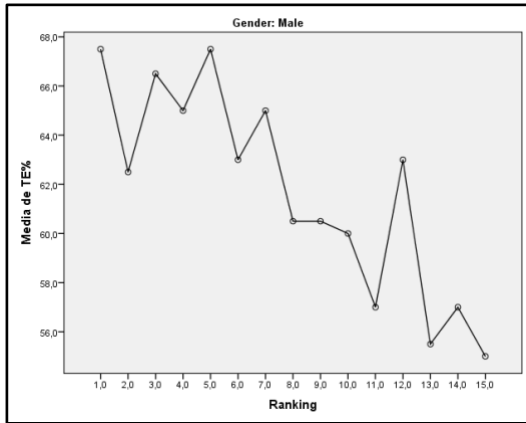


Figure 14. Relationship between the effectiveness percentage in the total throws in men's category and the position in the final ranking

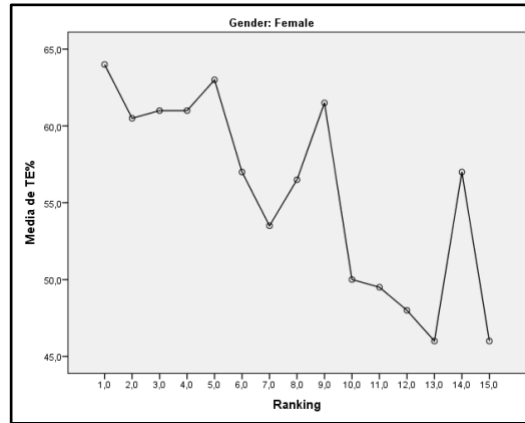


Figure 15. Relationship between the effectiveness percentage in the total throws in women's category and the position in the final ranking

Saves effectiveness, comparison according to the ranking

- **Men's category**

We cannot come to the conclusion that there exist significant differences ($p=,188$) in the effectiveness percentage of the goalkeepers' saves in men's category based on the ranking. In figure 16, we can observe the success percentage and the position in the final ranking. We can see that there is not a tendency in relation to the position in the ranking.

- **Women's category**

We cannot conclude that there exist significant differences ($p=,112$) in the effectiveness percentage of the goalkeepers' saves in women's category based on the ranking. In figure 17, we can observe the success percentage and the position in the final ranking. We can see that there is not a tendency in relation to the position in the ranking.

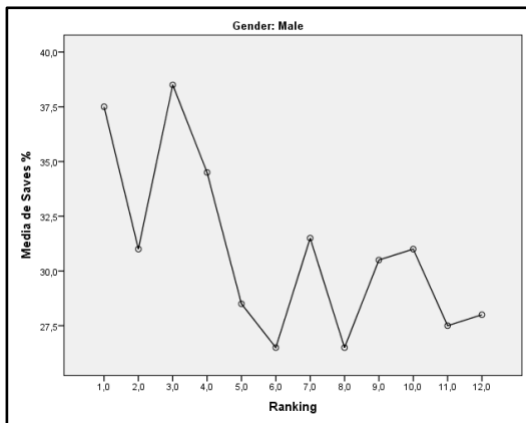


Figure 16. Relationship between the effectiveness percentage in the goalkeepers saves in men's category and the position in the final ranking

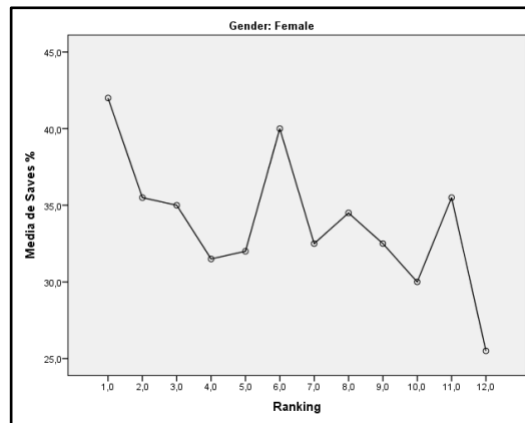


Figure 17. Relationship between the effectiveness percentage in the goalkeepers saves in women's category and position in the final ranking

Number of throws per match and relating the ranking

We cannot conclude that there exist significant differences in the throws number per match and relating the ranking. It happened the same in men’s and women’s category. In figure 18, we can observe the success percentage and the position in the final ranking. We can notice that there is not a tendency in relation to the position in the ranking.

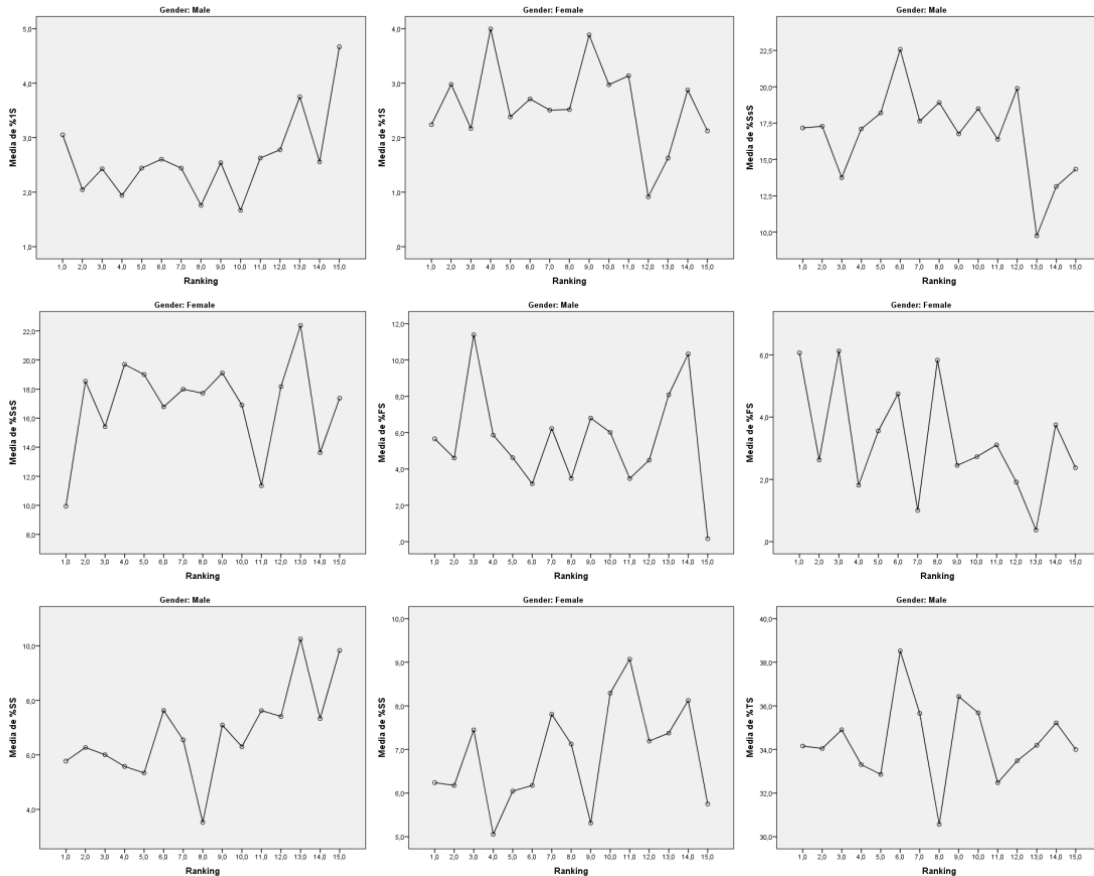


Figure 18. Relationship between the number of throws per match and the position in the final ranking

Received throws per match and relating the ranking

We cannot conclude that there exist significant differences in the received throws per match and relating the ranking. The same situation happened in men’s and women’s category. In figure 19, we can observe the success percentage and the position in the final ranking. In the We can also see that there is not a tendency in relation to the position in the ranking.

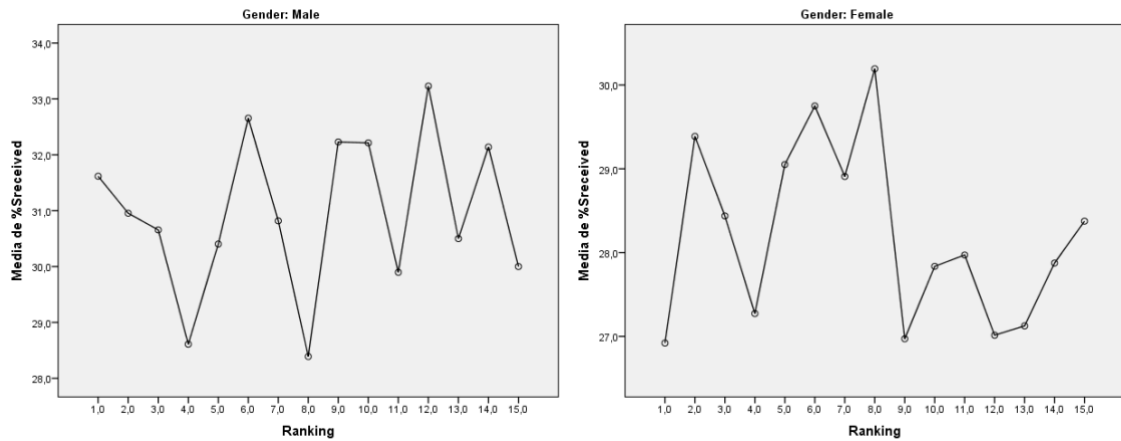


Figure 19. Relationship between the received throws per match and the position in the final ranking

Throws effectiveness, comparison according to the best teams

As in the rest of the results section, the groups of women and men will be shown individually in the one-point throws, in the spin shots and in the throws by the specialist player, and jointly in the rest.

- **Men´s categories**

We cannot conclude that there exist significant differences in the throws effectiveness in the one-point shot ($p=692$), spin shot ($p=148$), specialist throw ($p=165$) and total throws ($p=052$) when we are making a comparison according to the best male teams. In figure 21, we can observe that there exists a tendency; the best male teams are more effective in the spin shot and total throws when we are making a comparison according to the best teams.

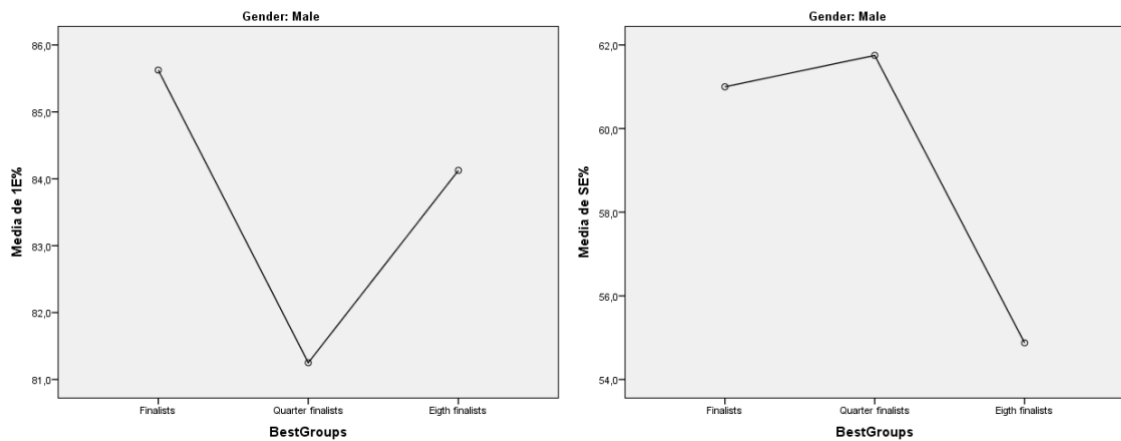


Figure 20. Throws effectiveness in the one-point throw and specialist throw when we are making a comparison according to the best male teams

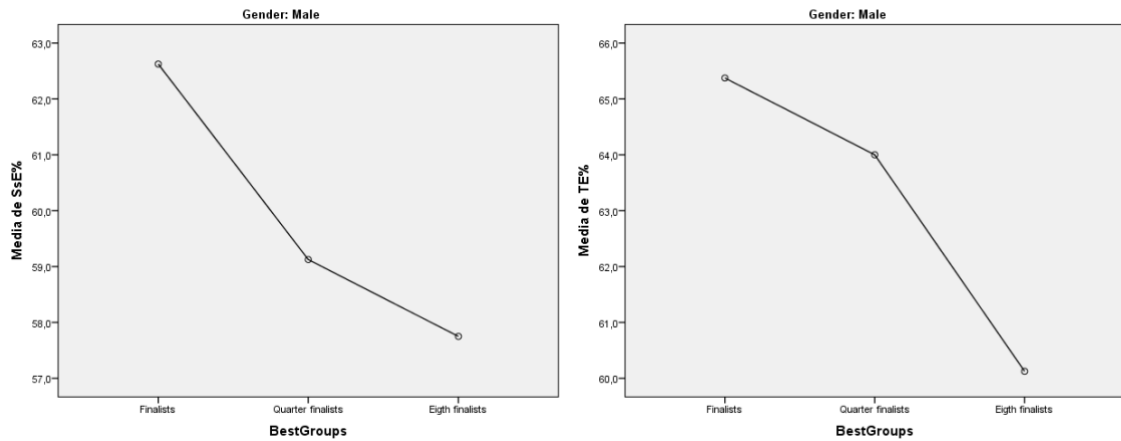


Figure 21. Throws effectiveness in the spin shot and total throws when we are making a comparison according to the best male teams

- **Women´s categories**

We found statistically significant differences ($p < .01$) in the spin shot, specialist throw ($p < .05$) and total throws ($p = .01$) when we made a comparison according to the best female teams. We cannot conclude that there exist significant differences in the throws effectiveness in the one-point shot ($p = .932$) when we are making a comparison according to the best female teams. In figure 22 and 23, we can observe the graphics of these actions.

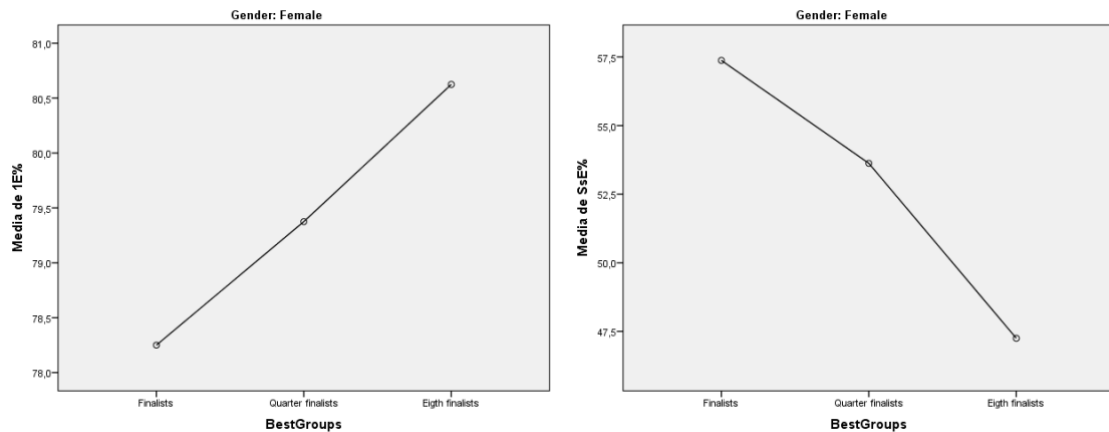


Figure 22. Throws effectiveness in the one-point throw and spin shot when we are making a comparison according to the best female teams

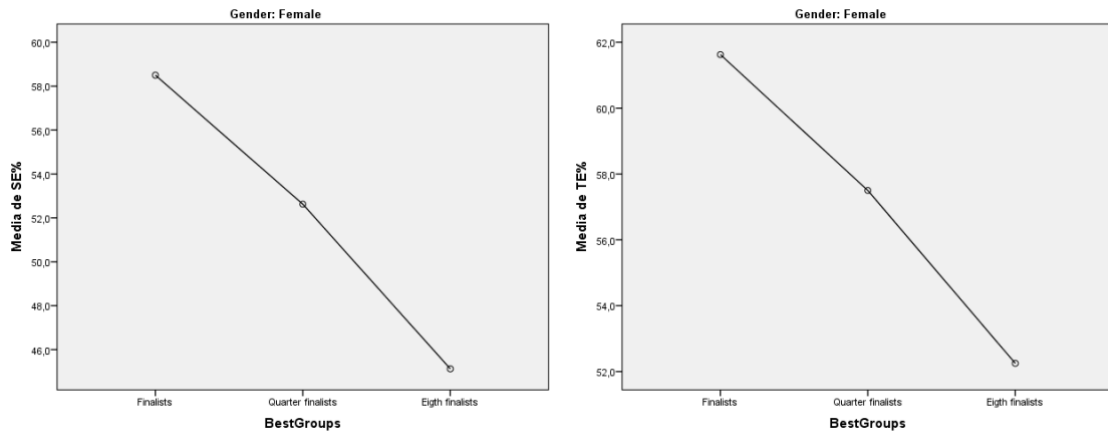


Figure 23. Throws effectiveness in the specialist throw and total throws when we are making a comparison according to the best female teams

- **Men's and women's categories**

We cannot conclude that there exist significant differences in the throw effectiveness in the inflight throw ($p=328$), 6-metre throw ($p=997$) and goalkeeper throw ($p=706$) when we are making a comparison according to the best teams. In figure 24, we can observe the graphics of these actions.

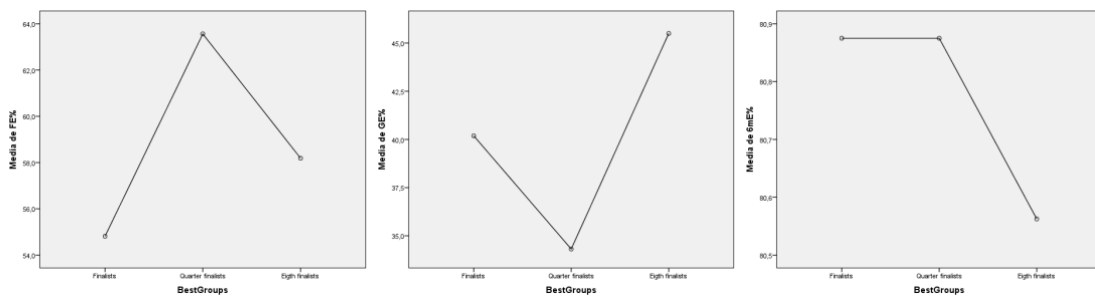


Figure 24. Throws effectiveness in the inflight shot, goalkeeper throw and 6-meter throw when we are making a comparison according to the best teams

Saves effectiveness, comparison according to the best teams

- **Men's categories**

We found statistically significant differences ($p<.01$) in saves effectiveness when we are making a comparison according to the best male teams. In figure 25, we can observe the graphics of these actions.

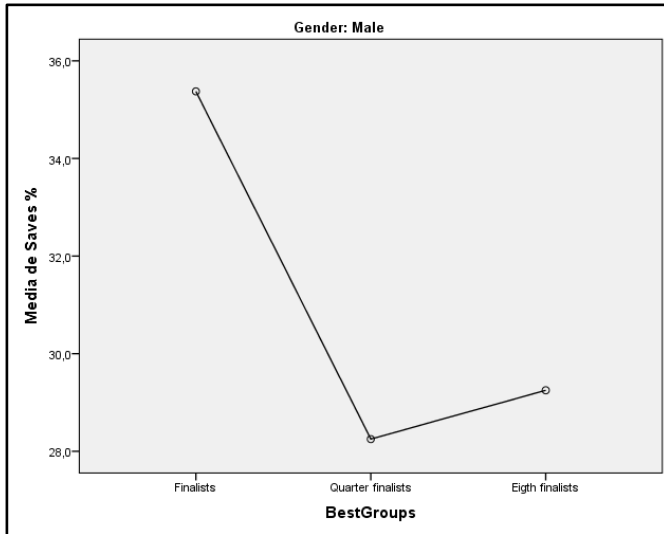


Figure 25. Saves effectiveness when we are making a comparison according to the best men's teams

- **Women's categories**

We cannot conclude that there exist significant differences ($p=,199$) in saves effectiveness when we are making a comparison according to the best female teams. In figure 26, we can observe the graphics of these actions.

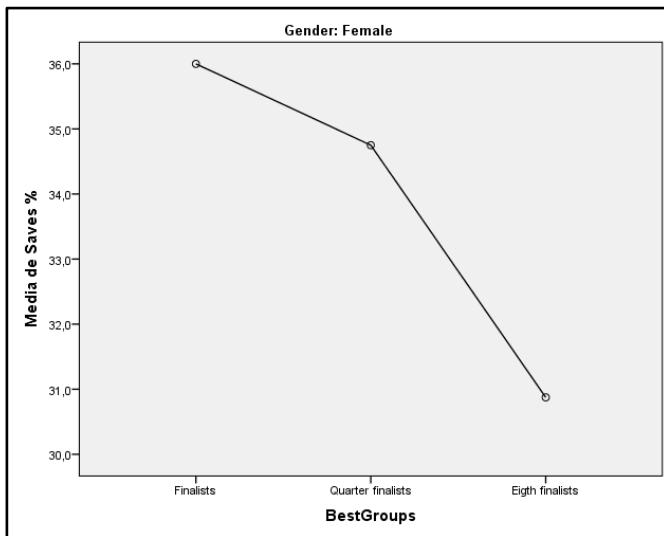


Figure 26. Saves effectiveness when we are making a comparison according to the best female teams

DISCUSSION

We will begin the discussion by analyzing the players' anthropometric data. Then, we will follow the order of the different sections of the results.

The average height of the absolute male players has gradually increased throughout the different championships until reaching the maximum height in Randers 2013. Starting with 187 cm in the Alanya European Championship (Guerrero & Van Linder, 2004), players were 188 cm

tall in Umag (Tezcan, 2011), 192 cm tall in Randers (Tezcan, 2013) and 191.5 cm tall in the Zagreb European Championship 2017. In the absolute female category, height has remained stable since the first championships: 175 cm tall in Alanya (Guerrero & Van Linder, 2004), 174 cm tall in Umag (Tezcan, 2011), 176 cm tall in Randers (Tezcan, 2013) and 176 cm tall in Zagreb. In the same championships, players' weight was respectively: 86 kg and 69 kg in 2004, 87 kg and 67 kg in 2011, 81 kg and 64 kg in 2013, and 90 kg and 68 kg in 2017. As these data have stabilized in recent years, we could consider that the average height and weight of elite beach handball players is ± 190 cm and ± 90 kg in men, and ± 175 cm and ± 68 kg in women. These data reflect very similar body mass indexes to those of elite handball players (Ramos, Camina, Alonso, Redondo & de Mateo, in press). In this sense, we consider that the elite beach handball player should reduce these body mass indexes for a better adaptation to the playing surface (Zapardiel, 2015).

Another aspect studied in the previous European beach handball championships has been the number of games that have reached the shoot out to untie. The authors of the articles relate it to the greater or lesser equality of the teams. In the Adriatico Misano European Championship 30% of games came to shoot out (Gehrer & Trespidi, 2007). Tezcan (2013) makes a summary from the first European championship and, on average the percentage of games that end up in shoot out is between 30% and 40%. In Zagreb (2017), the average reached 47.01% of shoot-out games. If we really take this data as an indicator of equality in terms of the teams' level, we could say that these championships have been the most balanced in the history of beach handball. If we delve into the different categories, we see that the most balanced category was the absolute male with a percentage of matches of 61.22%, followed by the under-17s females with 45.23%; in third place, the absolute females that ended up with 42.85% and the last percentage was that of the under-17s males that reached 38.77% of matches that used the shoot out to break the tie. All the categories obtained quite high values but it is really the absolute male category that marks the historic milestone.

Fourteen thousand four hundred eighty-five throws were carried out and the goalkeepers saved 4,619 throws, which leads to an average percentage of total saves of 31.8%. It must be borne in mind that saves are also included in the direct blocks and blocks of the counter-spin. This is a handicap for analysis but the software used does not differentiate between the two types of actions. In relation to the different categories, the absolute males had an average percentage of saves-blocking of 30.2%, the absolute females of 34.7%, the under-17 males of 29.9% and the under-17 women of 32.5%. When we compared the different categories in our statistical analysis, we did not find statistically significant differences, but we did pay attention to the higher percentages of saves and blocks for the national women's teams. Later, when we analyze the effectiveness of the throws, we will observe that the differences in the ranking of the women teams are marked by the effectiveness in the throwing.

In these championships, it has become clear that all the participating categories (we only find statistically significant differences in the inflight throw) base their game model on the exploitation of the spin shot over the rest of the actions. The use of the throws by the specialist player and the inflight throw remain in second place. The spin shot reached an average of 47% against 15 and 18% of the inflight throw and the release of the specialist player respectively. The specialist player has reduced his contribution as a shooter, a trend of the first European championships (Guerrero & Van Linder, 2002, 2004) and has ratified the trends that marked the latest analyzes (Tezcan, 2011, 2013), apart from being a shooter he is also a play maker. The big difference of the game model of this European championship in relation to the

latest analysis can be that all categories have reached spin percentage above 45% to the detriment of inflight throw and specialist player throw, something that did not happen in the previous championships. This style of play can be guided by defensive systems. These defensive systems try to leave more spaces in the outer zones, close the passes to the pivots and focus their attention on the specialist player, which forces the attacks to play with the throws that are showing greater effectiveness from outside areas.

Other data analyzed in this study have been effectiveness of total throw and effectiveness depending on the type of throw. The overall effectiveness of the men's category in this Zagreb championship showed a slight increase compared to the effectiveness of the last championship analyzed, Randers 2013 (Tezcan, 2013). The total effectiveness in Randers was 60.3% and that of Zagreb, 62.4%. In the Randers championship, the effectiveness increased by 5% compared to the Larvik and Umag championships (Tezcan, 2013). In relation to the one-point shot, effectiveness lowers compared to Randers, from 83.5 to 79.3. The great increase in effectiveness of the one-point shot was observed in Randers when compared with Larvik and Umag, it went from 73% to 83%. However, the effectiveness of the spin shot has risen by 4%, from 55.8% in Randers to 59.9% in Zagreb. Very similar values are maintained in the inflight throws (61%), specialist (57%) and goalkeeper (47). Absolute women are decreasing their effectiveness throughout the championships. They have moved from 62.2% in Larvik (Tezcan, 2013) to 55.4% in Zagreb. Comparing it by the type of throw with Larvik, we can observe that in the one-point shot it has lowered by 5%, an effectiveness of 81.7% in Larvik and in Zagreb of 76.8% was obtained, in the spin shot it has lowered by 4%, in the inflight up to 16%, in the specialist 3% and in the direct throw of the goalkeeper they also fall up to 23%. The young men obtained their best values of effectiveness in Nagystad 2008 (Tezcan, 2013) with a total effectiveness of 62.3% and in Zagreb a total effectiveness of 61.4 has been achieved. In the one point throw, 72.5% was obtained in Nagystad and 86.4% in Zagreb, 61.7% in the spin shot in Nagystad, 55.2% in Zagreb, 73.1% in inflight in Nagystad and 59.2% in Zagreb, the specialist in Nagystad 55.3% and in Zagreb 59.2%, and in the direct throw of the goalkeeper in Nagystad 26.4% and in Zagreb 42.3%. In the youth women, the championship with the highest throw effectiveness was that of Batumi 2012 (Tezcan, 2013). The total effectiveness was 60.3%. In Zagreb it was 57.3%. In the one-point shot, 68.7% was obtained in Batumi and 83.1% in Zagreb, in the spin shot in Batumi 58.2% and in Zagreb 52.8%, in inflight in Batumi 62.0% and in Zagreb 59.9%, in the specialist in Batumi 55.8% and in Zagreb 54.1%, and in the direct throw by the goalkeeper in Batumi 70.0% and in Zagreb 33.3%. The variations of effectiveness according to the type of release of these last categories are high and it may be due to the immaturity of these ages.

In this analysis we have tried to know if the effectiveness, the number of throws made per game, the number of throws received per game and the efficiency in the saves of the goalkeepers are related to the position in the final ranking. First, we made an analysis of the teams individually and, subsequently, based on three groups: finalists, quarter-finalists and eighth finalists. In none of the categories, the effectiveness of the one point shot showed relation to the final ranking. In the effectiveness of spin shot, both women and men showed trends in the relationship effectiveness-ranking, which can be observed in figures 7 and 8. However, only women showed statistically significant differences. In the effectiveness of inflight throw we have not found a relationship with the final ranking neither in male nor in female category. Relating the throws by the specialists, only a small tendency is observed in the women. In the goalkeeper's direct throws and in the 6-meter throw there is no relationship. When the total effectiveness was analyzed, a trend was found in both women and men and, in addition, statistically significant differences were found in women. These

contributions show the relationship between effectiveness in female categories, especially in the spin shot, and the final ranking.

Effectiveness of the goalkeepers' saves did not show a relationship or trend with the final position in the ranking when the teams were analyzed individually. Nor there was any relationship or trend when analyzing the number of throws made by each team per game. Figure 18 clearly shows this statement. The same situation happens with the number of throws received per team per game.

When performing the analysis grouping the best teams, we find that the results are very similar. In the male categories, there was no relationship between the effectiveness of any of the analyzed throws and the final position in the ranking. There was a tendency in the spin shot and in the total percentage of throws (figure 21). In women, there was a relationship and trend in the effectiveness of spin shot, specialist throw and total throws (figure 22 and 23). In relation to the effectiveness of goalkeeper saves, we only find differences in the men's finalists. The best four teams in men's categories obtained better percentages of saves than the rest of the teams. Both the results of the men teams treated individually and the latter grouped with the criterion of best men teams have shown that the level of national beach handball teams is very similar. The first positions of the ranking are decided by small details. In the case of the first four men's teams, we only find significant percentages of goalkeeper saves. There is also a tendency to believe that the most effective spin shot is another aspect that can lead you to be among the best teams.

In the first analysis of a European championship, Guerrero and Van Linder (2002) showed defensive and offensive structures that in the end have changed very little. The systems have changed indeed, in particular all the offensive ones, but we believe that beach handball still needs a greater evolution that accompanies the great technical improvement that the players are offering. In the last European championship, the most used defensive structure remained 3:0, which varied depending on the system, showing more or less depth depending on the requirements of the matches or the morphological characteristics of the players that make up the teams. Teams with high-altitude players based their 3:0 defensive system on using shallow depths, closing the passes to the pivots and allowing wing throws to try to do the counter-spin or collaborate with the goalkeeper. In this sense, the player carrying out the counter-spin is the central defender instead of the outside more often. Some teams tried to adapt their 3:0 defensive systems to the technical capabilities of the opposing players or to the offensive systems with which they were attacked. A very clear example of the first case was shown by the teams that had to face the Italian under-17 male team. As the Italian wings made the spin shot easily receiving very close to the line of 6 meters, the outside defenders increased the depth when the ball was in the opposite zone. With this action they wanted the Italian wings to delay their position in order to receive the ball. An adaptation in relation to the second case, adaptation to the rival offensive system, had to be made during the championship to the offensive systems 4:0 and 3:1 when they used fixations in the central zones of one of the players that was not the specialist. These offensive systems were already seen in Adriatic Misano (Gehrer & Trespidi, 2007) but the offensive evolution of this European championship was to see the players receive in static position and go forward with jumps with both feet together, in any of the jumps the players could perform the spin shot and force the central defenders to wait in static at 6 meters to make the decision of the attacking player. Throughout the championship, it was possible to observe how the depth of the central defender increased trying to create greater uncertainty in the player with the ball and trying to cut the possible passes from areas further away to 6 meters. The same two-foot jump

technique was used in shoot-outs. With this, the player has the possibility to do the spin shot in each jump. In this way, they were able to overcome with more ease the exit of the goalkeeper in the shoot out. To overcome the goalkeeper all kinds of spin shots were observed: vertical, to catch the goalkeeper midway and throw in vaseline; lateral, to take more shot angle and overcome the goalkeeper, or horizontal to have more time to observe the goalkeeper.

Another defensive system used in Zagreb was 2:1, usually placing the advanced player in the central zone. The depth varied depending on the ability of the specialist player to throw, penetrate and assist. In some cases, the 2:1 became a 2+1 system on the specialist player allowing the 3x2 of the other players. In the men's final, Spain used the 2:1 system very deeply on the Russian specialist player and in some cases it became 2+1. This time the result was very good. The man-to-man defense was very little used, as usual, it was only done in some games in which the teams had to risk to try to overcome an adverse result, in the final seconds of the match or in numerical equality. In this sense, we must highlight the excellent defense man-to-man of the French absolute women's team. Also, the defensive novelties offered good results. An example was shown by the Danes against the offensive systems 3:1 with the specialist in the center, they pressed the wings and the pivot when the specialist received the ball. In this way, they achieved many successful defensive actions.

The most used offensive structure in all categories in Zagreb was 3:1 with different game systems. It was very common to see the specialist in the center of the attack but variations were also seen placing the specialist in either of the wings. In some cases, even, in the wing contrary to the zone of changes. The 4:0 structure and its different systems were more used in the female categories. A strategy that is increasingly used is to perform the four attack-defense changes. It was also seen in Zagreb and it was shown that this strategy favours, among other aspects, that players are more rested.

Guerrero and Van Linder (2002) made an analysis of the offensive and defensive systems of the Cádiz European Championship. Among the aspects that one of them highlighted was that the fast break had its 3 very marked phases. In this last European event in Zagreb (2017), it has become clear that the first two phases of the fast break are almost underused. The little use of the first phase, the direct throw of the goalkeeper, can be justified by the low percentages of success that are obtained. Only 238 throws were made between the four categories in this championship, 2% of the total throws, and the percentages of success were below 50% in men and 40% in women. An action in which the throw is made towards an empty goal should have a higher percentage of success. We believe that the training of the first phase of the fast break should be an essential part of the session. It is clear that the second phase of the fast break has been reduced because the defensive changes are made properly. For this reason, the teams refuse this second phase. Our opinion goes along the same lines as what we mentioned in the first phase. We consider that the teams should not renounce to exploit this second phase of the fast break since, although the teams carry out the defensive changes correctly, in many cases it is possible to take advantage of the imbalances that take place when making the changes at maximum speed. The third phase of the fast break is used depending on the partial result of the sets or at certain moments during the matches. Examples of teams that exploit this third phase in most cases could be the men's national under-17 from Italy and Spain, and Spain absolute men's team. The third phase of the fast break of Italy and Spain under-17 men is especially attractive. They start by fixing the wing that does not change and the other players who make the changes continue the fixations. These changes are made far from the 6-meter zone to receive racing with greater speed. The fast break ends with the entry of the specialist

player going fast. In our opinion, if we want to make the most of the beach handball's potential and, what is more important, if we want a more spectacular beach handball, we must train and try to exploit all phases of the fast break.

To conclude the discussion, we want to comment on some technical details that we have observed in younger players. In this under-17s European Championship, it has been observed an increase in players who receive one-hand passes for the inflight shot. From a biomechanical point of view, we believe that, with this technique, it is easier for them to throw and that they can increase efficiency. It could be a good subject for future researches. We observed players with greater ability to jump but especially players with a lot of ability to modify the position of the body in the air which allowed them to overcome defenders and goalkeepers. In relation to defensive aspects, we have observed a notable increase in the technical improvement of counter-spin. They have improved in the times of execution and in the adaptation to the type of jump and type of throwing of the attacking player. Another outstanding feature was the versatility of many of the players and the possibility of playing in several specific positions. We believe that this versatility is increasing and that this offers a lot more strategic potential to the coaches.

CONCLUSIONS

Elite beach handball players have an average height and weight of ± 190 cm and ± 90 kg in men, and ± 175 cm and ± 68 kg in women. This reflects an average body mass index of 25 in men and of 22 in women.

The European Championship in Zagreb 2017 has marked a historic milestone in relation to the number of games that ended in shoot out in the absolute male category with a total percentage of 61.22%.

The average percentage of goalkeeper saves at beach handball international level is $\pm 32\%$.

If we want to analyze the saves with guarantees, we must collect the direct blocks and the counter-spin blocks and differentiate them from the goalkeeper saves. They cannot be analyzed by treating them as a single group. In this same sense, it would be very interesting to collect data on the different phases of the fast breaks and on their effectiveness.

When comparing the effectiveness in the youth championships, it can be observed that there is a great irregularity depending on the types of throws. The cause may be that at this age the immaturity can lead them to make mistakes that are not due to a bad technique but to the nervousness that high-level competitions produce. This is magnified in young women. In many cases, it will be opportune to increase the psychological strategies in the training sessions.

The analysis of effectiveness has shown that one of the aspects that has decided the final ranking in the female categories has been the effectiveness of spin shots. These contributions highlight the importance of stressing this type of throw during the training sessions. In this sense, another throw in which the attention should be increased in training sessions would be the specialist's. Although the effectiveness of the goalkeeper's direct throw did not mark differences in the championship, we thought that it should be trained more, since it is a throw with great potentiality of success and, above all, that gives a very identifying character to beach handball.

The number of throws made and received during a beach handball match has no relation to the final position in the ranking. It is important to highlight that the positions and conditions in which the throws are made or received have not been analyzed. It would be very interesting to carry out studies in this line of work.

The level of play of all the national teams of beach handball is very similar. In the men's teams, only a better percentage in goalkeeper saves marks the differences of the four best teams in Europe. Second, the effectiveness of the spin shot could be another factor that would make a player more likely to succeed.

The offensive and defensive systems have had very few variations. The variations of the collective systems that we have been able to observe have been carried out during the championship and have been the product of adaptations to the technical capacities of some of the players.

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