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# Offensive zones in beach volleyball: differences by gender

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## ABSTRACT

Chinchilla-Mira JJ, Perez-Turpin JA, Martinez-Carbonell JA, Jove-Tossi MA. Offensive zones in beach volleyball: differences by gender. *J. Hum. Sport Exerc.* Vol. 7, No. 3, pp. 727-732, 2012. Gender differences in anthropometric and athletic properties (e.g. strength) as well as the different net heights (2.24 vs. 2.43 m) on the same field size (8x16 m) would be reflected in the game. The literature about differences between male and female playing characteristics in beach volleyball is scarce. Therefore, the aim of this study was to analyse the differences by gender in the use of offensive zones. Study participants were 20 players (10 female and 10 male) who took part in the European Beach Volleyball Championship 2005 and 2006. Video recordings were made of the 659 points in eight matches played. The beach volleyball court was divided into six zones (z1 to z6). The results showed that men and women use different offensive zones and also were different in the percentages of ball out (15.53 and 27.38% respectively). Concretely, men players used more 1, 2, 4 and 5 zones and women 1 and 5 zones. A few differences were observed in the percentage the ball to the net (7.73 and 5.35% respectively). An understanding of the use of offensive zones is relevant to establish specific tactical training patterns for beach volleyball. **Key words:** ZONES, OFFENSIVE, BEACH-VOLLEYBALL, ANALYSIS, CHAMPIONSHIP.



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## INTRODUCTION

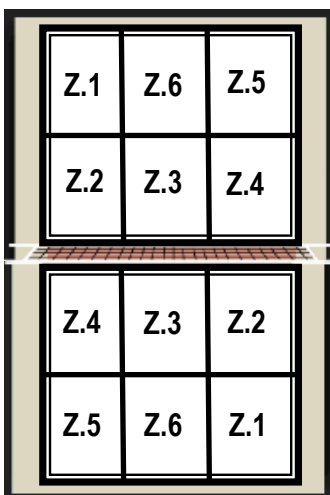
Beach volleyball which is played two against two on an 8x16-m court, is a worldwide growing sport; it became an official sport at the Olympic Games in 1996 (Cortell-Tormo et al., 2011). Beach volleyball is a fantastic sport, (Kiraly & Shewman, 2000), that is seeing a spectacular growth in popularity. The 2005 and 2006 Nestea European Championship Tour featured 10 events in 6 countries (Table 1).

**Table 1.** *Tournaments Nestea European Championship Tour (2005 y 2006).*

Competition	Year	Place
Nestea Turkish Open	2005	Alanya (Turkey)
Nestea Spanish Open	2005	Valencia (Spain)
Nestea Swiss Open	2005	Lucerne (Switzerland)
Nestea European Championship Final	2005	Moscow, (Russia)
Nestea Turkish Masters	2006	Alanya (Turkey)
Nestea German Masters	2006	Hamburg, (Germany)
Nestea Spanish Masters	2006	Valencia (Spain)
Nestea Swiss Masters	2006	Lucerne (Switzerland)
Nestea European Championship Final	2006	The Hague (Netherlands)

Despite this, we must not forget that it is a young, developing sport that needs to be defined, structured and researched to situate it at the same level as other major sports.

One important aspect of investigation action sequences is the possibility to anticipate the behaviour of opponents (Koch & Tilp, 2009). Quantitative analysis of the different offensives zones in competition has frequently been used to design training sessions for players of different sports. However, beach volleyball lacks this type of research. This study was designed to develop a quantitative analysis of the offensives zones and identify an efficient and comprehensive system for comparing different offensives zones (zones (6), out side (T) and net (N)), (Figure 1). In addition, the introduction of the current scoring system with two 21-point sets without needing to have the service to score, a possible 15-point third set and the possibility of asking for time-outs (Penigaud, 2003), have led to clearly significant changes in the physiological (McErlean et al., 2000), technical and tactical demands of the sport. However, scientific research into beach volleyball is scarce and we therefore have to rely on competitive sport movement analyses carried out for such sports as basketball (Tsamortzis & Athanasiou, 2004). However, in the case of beach volleyball, the lack of prior analysis of offensives zones has severely limited research in this area. In addition, different methods (type of programme, video recording and subsequent computer analysis) have been used in other sports to document offensives zones and this can have an effect on the accuracy of the results. Recently, Cortell-Tormo et al. (2011), observed significant differences distribution of training work that should be dedicated to each zones types.



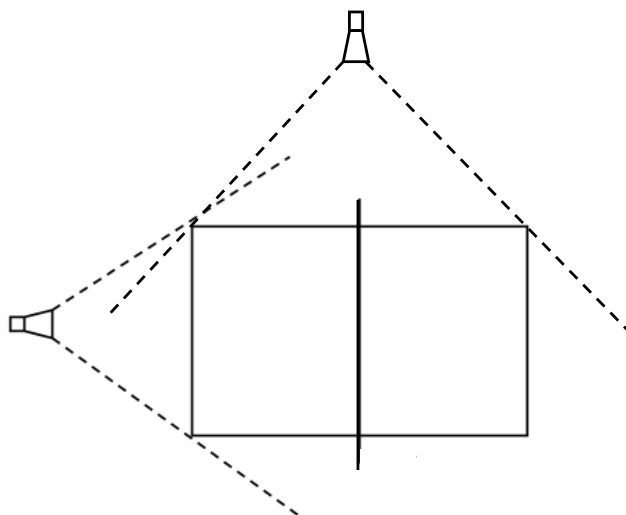
**Figure 1.** Definition of the six zones on the beach volleyball court.

Gender differences in anthropometric and athletic properties (e.g. strength) as well as the different net heights (2.24 vs. 2.43 m) on the same field size (8x16 m) would be reflected in the game. Therefore, the aim of this study was to analyse the differences by gender in the use of offensive zones.

## MATERIAL AND METHODS

The group consisted of twenty players, ten men (age= 30.5±4.6 years, height= 1.9±0.04 m and weigh= 87±5.3 kg), and ten women (age= 28.5±3.05 years, height= 1.75±0.06 m and weigh= 65.5±5.23 kg) were filmed for 18 sets spread over 8 matches played during the European Beach Volleyball Championships. The participants in the study were all members of their respective national men's teams.

Two video cameras (1 Sony Dcr-vx2100e and 1 Sony Trv738e) were placed around the playing surface (Figure 2), one facing down and the other across the court. The first camera was located facing across the court from a grandstand approximately 15 m above the action and the second faced down the court, approximately 10 m from the court and parallel to the baseline. Each camera was calibrated using four markers placed to create a reference framework that contained a 30% overlap over the boundaries of the court to allow actions when the ball left the limits of the court to be filmed by the cameras. The offensive zones were used during the matches and when the ball was out side or to the net. The duration of each point were recorded by each video camera, which were equipped with time counters calibrated in minutes, seconds and tenths of a second.



**Figure 2.** Diagram of the cameras' placement (an overhead view).

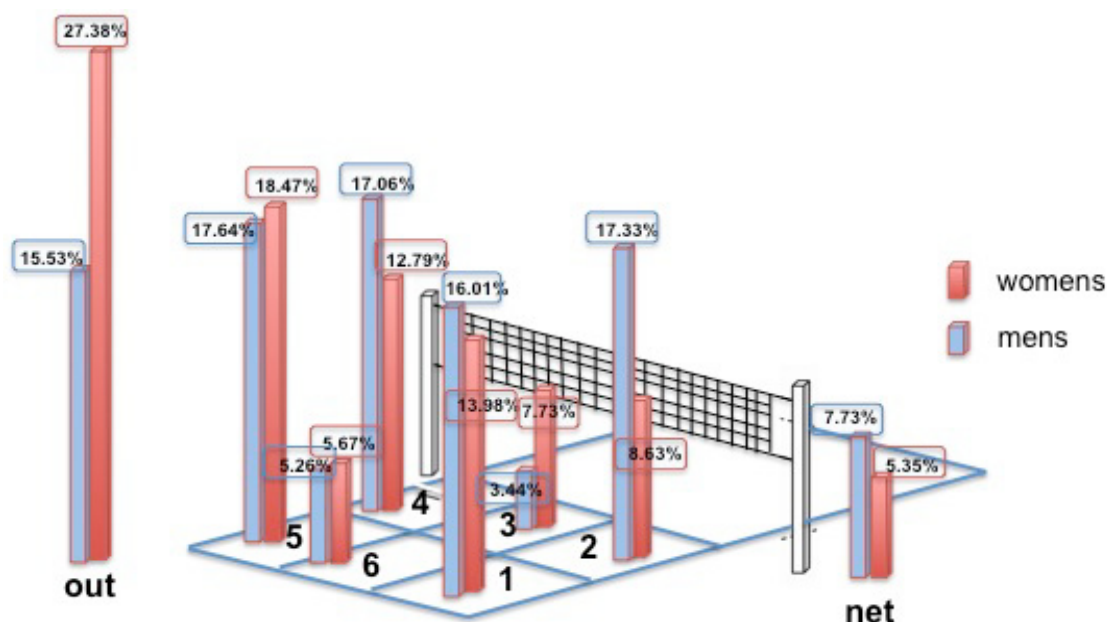
Each time record was captured by the video camera (Tilp et al., 2006) using the parameters of the whistle blown by the referee to allow players to serve the ball and the whistle used to signal the end of the point. In the same way, the offensives zones and identify an efficient and comprehensive system for comparing different offensives zones (zones (6), out side balls (O) and net balls (N)), (Figure 1). A recording matrix was constructed using the following coordinates: the first variable with number of point and the second of variable with to offensive zones. The results of points were quantified and all the figures were calculated by two experienced researchers, who rewound each point played twice to avoid computer software timer errors. The equation ( $\%error = 100 \times |A-B| / ((A+B)/2)$  (1)) was used to determine the percentage differences when calculating the reliability (Choi et al., 2007) of the systems using data from two observations A and B.

SportsCode v8 software was used for the study and the following stages were sequenced: A) Recording and digitalization of the images, B) Creation of a zones type matrix, C) Image capture for each matrix code, and D) Combination of the matrix codes to obtain zones performance in real beach volleyball competition. All the data was downloaded to a Microsoft Excel spreadsheet using the categories of zones type and time to calculate the frequency.

## RESULTS

Figure 3 show the percentage of use of the different zones by players in the four official competitive matches. Results of the offensive zones distribution is based in a six parts of the court.

Male players used offensive zones in the following percentages: z1=16.01%, z2=17.33%, z3=3.44%, z4=17.06%, z5=17.64% and z6=5.26%. The net balls were 7.73% and the out-side balls, 15.53%. In the other hand, female players used: z1=13.98%, z2=8.63%, z3=7.73%, z4=12.79%, z5=18.47% and z6=5.67%. We found 5.35% of net balls and 27.38% of out-side balls.



**Figure 3.** Offensive zones used in tournaments in the beach volley-ball elite.

## DISCUSSION

The results indicate differences by gender in the zone used to secure the points. Men and women differ of the used offensive zones in the official competitive matches. On the other hand, any differences in net distribution were detected but there were differences by gender in the out-side balls.

Our study showed the frequency of use of certain offensive zones between males and females during the European Beach Volleyball Championships (Valencia 2005 and 2006). We focused on identifying also the occurrence use of out-side and net balls (Z, O and N). Differences were found in two of the six areas in which distributed the playing field. These areas are zones 2 and 4, where men used to get more points. Moreover, there were no differences in the distribution network of balls is detected but detect differences in the output side between men and women. In addition, the percentages of use of achieving zones points quantification showed work of formation must be within these parameters. The comparison indicated that male and female top players apply different techniques for success.

The percentages of use of achieving zones points quantification showed that work of formation must be done within these parameters (Tilman et al., 2004). Tip and Koch (2011) affirm that current pitch size and the changes made to the scoring rules influence the use of different zones of point definition (Tsamourtzis & Athanasiou, 2004). Another study of Giatsis et al., (2008) explored the differences in playing characteristics between winning (W) and losing (L) teams in FIVB men's Beach Volleyball (BV) World Tour tournament. The results of our study will lead to a significant improvement in the preparation of training programmes for beach volleyball players, although the absence of any prior studies means that we should be cautious and only extract the opportune conclusions.

## CONCLUSION

Our study demonstrates that men and women differ of the used offensive zones in the official competitive matches. A better understanding of the areas to secure points is necessary to establish specific standards for beach volleyball training. Further investigations related to players tactical responses to competitive efforts are needed. This means that once you have analyzed the play areas where there are points and quantification of the balls that stay in the network and leaving off the field, we can start designing training methods based in actual competition, with special attention to technical actions with target zones tactics.

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