

# Influence of the play score on external load parameters in men's and women's professional padel

## Influencia del marcador sobre parámetros de carga externa en pádel profesional masculino y femenino

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## Abstract

The aim of this study was to analyse the influence of the game and set score on game volume and intensity parameters in professional padel. A total of 3241 points (1639 for women and 1602 for men) corresponding to 22 matches of the 2020 season of the World Padel Tour professional circuit were analysed through systematic observation. The results showed a longer playing time ( $p < .001$ ), number of lobs ( $p < .001$ ) and less intensity of the game ( $p < .001$ ) in female padel. These differences still exist depending on the point and game number. In addition, the playing time, rest time, number of shots per point and number of lobs is significantly higher in golden points compared to the rest of the points ( $p = .000$ ), with no differences depending on the number of games. In conclusion, during golden points, there is a higher point duration and a higher number of lobs comparing with the rest of the points, both in the male and female categories, not observing changes in the intensity of the game.

**Key words:** racquet sports, volume, intensity, performance, Golden point

## Resumen

El objetivo del presente trabajo fue analizar la influencia del marcador durante el juego y el set sobre parámetros de volumen e intensidad de juego en pádel profesional. Se analizaron mediante observación sistemática un total de 3241 puntos (1639 femeninos y 1602 masculinos) correspondientes a 22 partidos de la temporada 2020 del circuito profesional World Padel Tour. Los resultados obtenidos muestran un mayor tiempo de juego ( $p < .001$ ), número de globos ( $p < .001$ ) y menor intensidad del juego ( $p < .001$ ) en pádel femenino. Estas diferencias siguen existiendo en función del número de punto y número de juego. Además, el tiempo de juego, tiempo de pausa, número de golpes por punto y número de globos es significativamente mayor en el punto de oro respecto al resto de puntos ( $p = .000$ ), no encontrando diferencias en función del número de juego. En conclusión, el punto de oro provoca una mayor duración y número de globos en pádel respecto al resto de puntos, tanto en categoría masculina como femenina, no observando cambios en la intensidad del juego.

**Palabras clave:** deportes de raqueta, volumen, rendimiento, punto de oro.



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## Introduction

Padel is one of the most practiced sports in the world (International Padel Federation, 2022), and therefore deserves the attention of researchers. Thus, the number of papers that have this sport as a topic of study has increased in recent years. Specifically, during the last 5 years, half of the existing research on this sport has been published today. Many of these works provide objective data based on an observational methodology (Almonacid & Martínez, 2021; García-Giménez et al., 2022), with a special interest in the analysis of performance in professional padel. Several investigations have identified some game indicators that increase the effectiveness of players (Courel-Ibáñez et al., 2015; Courel-Ibáñez et al., 2017; Torres-Luque et al., 2015) or have determined the differences that exist between the winning pairs respect to the losing pairs (Escudero-Tena, Sánchez-Alcaraz et al., 2021; Ramón-Llín et al., 2020; Ramón-Llín et al., 2019; Sánchez-Alcaraz, Courel-Ibáñez et al., 2020).

Likewise, studies have been carried out that try to identify the differences between the game indicators in professional padel according to the gender of the participants (Escudero-Tena, Muñoz, Sánchez-Alcaraz et al., 2022; García-Benítez et al., 2016; Lupo et al., 2018; Torres-Luque et al., 2015). Thus, women make a higher percentage of united errors, while men make a higher percentage of winning shots (Escudero-Tena, Courel-Ibáñez et al., 2021; Fernández de Ossó, 2019). On the other hand, although men are more effective in the serve (Sánchez-Alcaraz, Muñoz et al., 2020), women are more effective at break points (Escudero-Tena, Courel-Ibáñez et al., 2021). Among the most frequent game actions in padel, men perform more reverse volleas (Escudero-Tena et al., 2020; Lupo et al., 2018; Sánchez-Alcaraz, Pérez-Puche et al., 2020; Torres-Luque et al., 2015). Another of the most analysed themes in padel revolves around the temporary game structure (Sánchez-Alcaraz et al., 2018), showing that the duration of the points is higher in women's padel (García-Benítez et al., 2016; Lupo et al., 2018). Likewise, the number of shots per game or by point has been studied, indicating, in the same way, a greater number of shots in women's padel (García-Benítez et al., 2016; Lupo et al., 2018).

Since the 2020 season, the World Padel Tour (WPT) professional circuit has incorporated the golden point rule, which consists of playing a point that will decide the game when the score is 40 equal (40-40). Thus, the pair that is to the rest chooses the place towards which the serve will be made (right or left), so that the pair that wins the point will be the one who wins the game (International Padel Federation, 2021). Some investigations have analysed the influence of the golden point on the scoreboard and the temporal structure of the game (Sánchez-Alcaraz, Muñoz, Ramón-Llín et al., 2020) or its relationship with the performance in professional players of men's and women's padel (Muñoz et al., 2022). These studies have observed a significant increase in the number of breaks carried out, also increasing the number of games by sets,

and slightly affecting the duration of the sets (3 minutes less). On the other hand, they observe that the golden point is a yield factor in padel, as winning pairs manage to win more gold points than the losers. In addition, compared to the men's category, in the women's category there is a higher percentage of games ended with gold points (Muñoz et al., 2022).

For the analysis of these performance indicators in men's and women's professional padel, researchers have taken into account various situations or game contexts. Different investigations indicate that there are significant differences between the different sets of a party (Escudero-Tena, Sánchez-Alcaraz et al., 2021; Muñoz et al., 2022), among the different rounds of the painting (Escudero-Tena, Sánchez-Alcaraz et al., 2021; Muñoz et al., 2022; Sánchez-Alcaraz et al., 2021), between the type of Master or Open Tournament (Sánchez-Alcaraz et al., 2021) or between different intervals of the point (point duration (Courel-Ibáñez & Sánchez-Alcaraz, 2017). In addition, other studies have employed parameters such as equality or not in the marker of the games or sets of a padel match (Muñoz, Courel-Ibáñez et al., 2017; Muñoz, Sánchez-Alcaraz et al., 2017) and even observational tools validated by experts have used variables on the scoreboard for the analysis of different game parameters (Escudero-Tena, Muñoz, García-Rubio et al., 2022; Escudero-Tena et al., in press).

However, no studies have been found that analyse external load parameters after the incorporation of the golden point rule, related to active play time, pause time, number of shots and lobs, as well as the number of shots by second (game intensity). On the other hand, works that analyse these external load variables have not been identified taking into account the characteristics of the score in the game or in the set. Therefore, the objective of this work was to analyse the differences between men's and women's professional padel for play and intensity volume parameters (understood as a number of shots per second), taking into account the marker of the game and the set.

## Methodology

### Sample and variables

The present research has been approved by the Bioethics Committee of the University of Extremadura (reference 154/2020). The analysis included a total of 3241 points (1639 women's points and 1602 men's points) corresponding to 22 games of the 2020 season of the WPT professional circuit of the quarter-final, semi-final and final rounds. The total points are distributed in 551 games (271 in the men's category and 280 in the women's category), played in 54 sets (27 men's sets and 27 women's sets).

The variables analysed were the following:

- Category: the men's and women's categories were established to establish the possible differences between them.

- Point number: three types of points were established according to the score: a first group of points that corresponded to the markers 0-0, 15-0, 0-15, 30-0, 0-30, 40-0, 40-0 0-40, 15-15, 30-15 and 15-30 (first, second, third and fourth point of each game); a second group of points corresponding to the scorers 40-15, 15-40, 30-30, 30-40 and 40-30 (fifth and sixth point of each game) and a third group formed by the golden point, when the marker is 40-40 (seventh point of each game).
- Game number: three games groups were established based on the start, half or end of the set: first 4 set games, games from 5 to 8, and games from 9 to 13.
- Active game time: the game time per point (measured in seconds) was quantified, since the player hits the ball in the serve until the point ends.
- Pause time: measured in seconds, corresponding from the end of the point to the beginning of the next.
- Number of shots: refers to the amount of shots that are made at one point, from the service until the point ends.
- Number of lobs: the number of lobs by point was quantified, considering as a globe to the technical-technical action in which the player hits the ball with a movement of the shovel from the bottom up with the head of the open shovel which print a trajectory to the parable ball with the aim of overcoming the rivals that are near the network.
- Intensity of the game: understood as the number of shots per second that are made at each point.

### Process

The analysed matches are broadcast in streaming and subsequently housed on the WPT website, where they were downloaded for the observation, collection and analysis of the data. Specialized Lince software (Gabin et al., 2012) was

used designing an ad-hoc instrument with the objective of analysing the variables object of study: gender, round, set, game time, number of shots and number of lobs. The game intensity variable was calculated from the number of shots and the duration of the point.

The data were analysed by systematic observation, conducted by an investigator specialized in padel and doctor of physical activity and sports sciences. In addition, at the end of the data collection process, an intra-observer reliability analysis was performed to ensure the veracity of the data collected. The observer analysed a sample of 350 points to guarantee a relevant amount of data, between 10-20% of the study sample (Igartua, 2006). Thus, the average reliability of the analysis test was .98 (Landis & Koch, 1977).

### Statistical analysis

For the statistical analysis of the data, the SPSS 27.0 statistical package for Windows was used. The results are expressed as average ± standard deviation. The Kolgomorov test and the Levene test homogeneity of the variances were used to determine the normality of the data. To determine the influence of the point and the game, the multivariate anova test was used. Bonferroni's post hoc test was performed to determine significant differences. Partial square ETA ( $\eta^2$ ) was calculated to determine the effect size and its magnitude was made based on the following ranges: .01-.06 a small effect size, .06-.14 A moderate effect size and >.14 A large effect size (Hopkins et al., 2009). For the comparison of the quantitative variables between the male and female categories, the Student T test was applied for independent samples The level of significance was established in  $p < .05$ .

### Results

Table 1 shows the results obtained in the parameters of volume and intensity in men's and women's padel.

**Table 1.** Results obtained in the men's and women's category (data expressed as mean ± standard deviation)

|                           | Men         | Women       | p     |
|---------------------------|-------------|-------------|-------|
| Game time (s)             | 13.76±10.48 | 15.06±11.87 | <.001 |
| Pause time (s)            | 23.22±21.09 | 23.68±18.02 | .527  |
| Number of shots per point | 10.72±7.98  | 10.98±8.55  | .378  |
| Number of lob per point   | 2.11±2.26   | 2.78±2.74   | <.001 |
| Game intensity (shots/s)  | .80±.17     | .74±.15     | <.001 |

s: seconds

The data show significant differences, in the parameters game time ( $p < .001$ ), number of lobs per point ( $p < .001$ ) and game intensity ( $p < .001$ ), understood as the number of shots per second. However, there are no differences in pause time or the number of total shots.

Table 2 shows the results obtained according to the number of points. As can be seen, there are significant differences between gender in the game time ( $p = .006$ ), as well as in the number of lobs ( $p < .001$ ) and the number of shots per set ( $p < .001$ ). In addition, there are significant

differences in all the variables analysed according to the point ( $p < .001$ ) being the duration, the pause time, number

of blows by point and number of lobs in the gold point compared to the rest of the points.

**Table 2.** Results obtained based on the number of points in the men's and women's categories (data expressed as mean  $\pm$  standard deviation)

|                           | Point number  | Men               | Women             | Effect Gender | $\eta^2$ | Effect point | $\eta^2$ | Gender x point | $\eta^2$ |
|---------------------------|---------------|-------------------|-------------------|---------------|----------|--------------|----------|----------------|----------|
| Game time (s)             | 1-4           | 13.57 $\pm$ 10.49 | 14.66 $\pm$ 11.37 |               |          |              |          |                |          |
|                           | 5-6           | 14.42 $\pm$ 10.87 | 15.39 $\pm$ 11.87 | <b>.006</b>   | .003     | <b>.000</b>  | .007     | .287           | .001     |
|                           | Golden point* | 16.90 $\pm$ 12.70 | 21.50 $\pm$ 16.79 |               |          |              |          |                |          |
| Pause time (s)            | 1-4           | 20.84 $\pm$ 22.61 | 21.60 $\pm$ 19.33 |               |          |              |          |                |          |
|                           | 5-6#          | 27.73 $\pm$ 15.26 | 28.14 $\pm$ 12.33 | .960          | .000     | <b>.000</b>  | .035     | .897           | .000     |
|                           | Golden point* | 36.68 $\pm$ 13.38 | 35.71 $\pm$ 12.27 |               |          |              |          |                |          |
| Number of shots per point | 1-4           | 10.59 $\pm$ 8.01  | 10.71 $\pm$ 8.19  |               |          |              |          |                |          |
|                           | 5-6           | 11.19 $\pm$ 8.12  | 11.17 $\pm$ 8.52  | .161          | .001     | <b>.000</b>  | .007     | .362           | .001     |
|                           | Golden point* | 13.12 $\pm$ 9.75  | 15.55 $\pm$ 11.96 |               |          |              |          |                |          |
| Number of lob per point   | 1-4           | 2.05 $\pm$ 2.20   | 2.69 $\pm$ 2.61   |               |          |              |          |                |          |
|                           | 5-6           | 2.26 $\pm$ 2.43   | 2.89 $\pm$ 2.89   | <b>.000</b>   | .008     | <b>.000</b>  | .009     | .376           | .001     |
|                           | Golden point* | 2.92 $\pm$ 3.05   | 4.26 $\pm$ 3.83   |               |          |              |          |                |          |
| Game intensity (shots/s)  | 1-4           | .80 $\pm$ .17     | .74 $\pm$ .14     |               |          |              |          |                |          |
|                           | 5-6           | .79 $\pm$ .16     | .73 $\pm$ .13     | <b>.000</b>   | .007     | .612         | .000     | .860           | .000     |
|                           | Golden point  | .78 $\pm$ .12     | .74 $\pm$ .10     |               |          |              |          |                |          |

\* $p < 0.05$  difference between golden point and other points with post hoc Bonferroni

# $p < 0.05$  differences between point 5-6 and other points with post hoc Bonferroni

Next, in table 3 the data related to the differences found in the variables of volume and intensity between gender and game number are exposed. Thus, the results show significant differences in times of play depending on the

gender ( $p < .001$ ), number of lobs and intensity of the game. For its part, there is a longer duration, greater number of lobs and lower number of shots per second in women's padel ( $p < .001$ ) regardless of the game number.

**Table 3.** Results obtained based on the number of games in the men's and women's category (data expressed as mean  $\pm$  standard deviation).

|                           | Game number | Men               | Women             | Effect Gender | $\eta^2$ | Effect game | $\eta^2$ | Gender x game | $\eta^2$ |
|---------------------------|-------------|-------------------|-------------------|---------------|----------|-------------|----------|---------------|----------|
| Game time (s)             | 1-4         | 13.81 $\pm$ 10.66 | 14.81 $\pm$ 11.80 |               |          |             |          |               |          |
|                           | 5-8         | 14.25 $\pm$ 10.90 | 14.55 $\pm$ 11.04 | <b>.000</b>   | .004     | .307        | .001     | <b>.028</b>   | .002     |
|                           | 9-13        | 13.51 $\pm$ 10.13 | 16.67 $\pm$ 13.28 |               |          |             |          |               |          |
| Pause time (s)            | 1-4         | 23.58 $\pm$ 19.35 | 24.11 $\pm$ 16.02 |               |          |             |          |               |          |
|                           | 5-8         | 22.08 $\pm$ 11.91 | 22.86 $\pm$ 9.79  | .569          | .000     | .110        | .001     | .908          | .000     |
|                           | 9-13        | 24.30 $\pm$ 14.53 | 24.25 $\pm$ 9.65  |               |          |             |          |               |          |
| Number of shots per point | 1-4         | 10.71 $\pm$ 7.99  | 10.65 $\pm$ 8.43  |               |          |             |          |               |          |
|                           | 5-8         | 11.04 $\pm$ 8.25  | 10.72 $\pm$ 7.91  | .244          | .000     | .125        | .001     | .061          | .002     |
|                           | 9-13        | 10.74 $\pm$ 8.05  | 12.22 $\pm$ 9.68  |               |          |             |          |               |          |
| Number of lob per point   | 1-4         | 2.17 $\pm$ 2.36   | 2.76 $\pm$ 2.76   |               |          |             |          |               |          |
|                           | 5-8         | 2.17 $\pm$ 2.33   | 2.67 $\pm$ 2.60   | <b>.000</b>   | .019     | .585        | .000     | <b>.037</b>   | .002     |
|                           | 9-13        | 2.00 $\pm$ 2.07   | 3.09 $\pm$ 2.98   |               |          |             |          |               |          |
| Game intensity (shots/s)  | 1-4         | .80 $\pm$ .17     | .73 $\pm$ .14     |               |          |             |          |               |          |
|                           | 5-8         | .79 $\pm$ .17     | .75 $\pm$ .14     | <b>.000</b>   | .029     | .553        | .000     | .186          | .001     |
|                           | 9-13        | .79 $\pm$ .17     | .74 $\pm$ .13     |               |          |             |          |               |          |

s: seconds

## Discussion

The objectives of this study were to analyse the existing differences between men's and women's professional padel in parameters of play and intensity volume, determining the possible differences between them taking into account the marker of the game and the set.

As well as the data obtained in other previous studies (García-Benítez et al., 2016; Lupo et al., 2018), the results of this investigation show how in women's padel a larger duration of the points (regardless of the scoreboard). This longer playing time in women's padel could be due to a greater use of the lob in all the points and games of each set or match, as shown by the results found in similar investigations (García-Benítez et al., 2016; Lupo et al., 2018; Torres-Luque et al., 2015). In addition, this longer duration could also be related to a greater use of crossed trajectories in women's padel (Sánchez-Alcaraz, Pérez-Puche et al., 2020), and a greater number of shots made from the middle zone or the bottom of the track (Lupo et al., 2018; Torres-Luque et al., 2015). In addition, women use the tray hit more, which in almost 90% of cases implies the continuity of the point, with very few errors derived from its execution and return (Sánchez-Alcaraz, Pérez-Puche et al., 2020). On the contrary, men perform more flat or topspin shots, which are very effective shots with which they directly earn a large number of points (Sánchez-Alcaraz, Pérez-Puche et al., 2020), or that would cause a shorter duration of the points.

These characteristics in the women's padel game result in a lower intensity of the game, that is, a lower number of shots per second compared to the characteristics of the men's padel game, as shown by the results of this study. For their part, García-Benítez et al. (2016), tried to quantify the effort made during the game based on the duration of the points and the pauses between points, obtaining that, although in women's padel there is a longer duration of the points, there is a longer rest between points. In addition, the differences in anthropometric characteristics between elite men's and women's players could be another aspect that influences the volume and intensity of the game, since men have a higher muscle percentage and higher levels of grip strength than women's players (Pradas et al., 2021), which would allow them to shot the ball with greater force and speed. Thus, the men's padel presents a lower volume of play, but a greater intensity than the women's padel regardless of the marker, and, therefore, while the men's professional padel is characterized more by the development of parameters of explosive force, power and hitting speed, in women's professional padel more importance is given to the development of resistance.

As far as is known, the only studies that have analysed the influence of the golden point on the game indicate an increase in the number of breaks, increasing the number of games per set and slightly decreasing its duration. In addition, they indicate that the gold point is a performance

factor in padel, where the winning pairs get a greater number of gold points earned. In addition, in the women's category there is a higher percentage of games finished with gold points (Muñoz et al., 2022; Sánchez-Alcaraz, Muñoz, Ramón-Llin et al., 2020), which would indicate greater equality in the scoreboard of the play. The results of the present investigation show a greater duration, pause time, number of shots per point and number of lobs in the golden point compared to the rest of the points. These findings are very new, since it is the first investigation that differentiates the external load parameters analysed according to the point in the game after the incorporation of the golden point, so padel players should take them into account, in order to know the characteristics of the point that they are going to play to act in one way or another. For their part, although the golden point rule had not yet been incorporated, Sánchez-Alcaraz et al. (2019) already observe that the importance of the point on the scoreboard causes players to increase the rest time between points, which could be due to both tactical aspects in preparing the point and the need for greater recovery to face the next point. Similarly, other studies that analyse various parameters of performance in men's and women's padel and that take into account different contextual or situational game variables such as the set number, the round of the draw or the type of tournament find significant differences in the game (Escudero-Tena, Sánchez-Alcaraz et al., 2021; Muñoz et al., 2022; Sánchez-Alcaraz et al. 2021; Sánchez-Alcaraz, Muñoz, Pradas et al., 2020). Thus, men's and women's padel players must pay attention to each moment of the game and act in a specific way.

However, this study has a series of limitations that must be taken into account when interpreting the results. On the one hand, the set number could affect the results obtained, since the dispute of a third set is definitive for the final score. In addition, the environmental conditions of the tournaments played could be different, although they did not vary between game categories within the same tournament. Factors such as altitude or humidity could affect the game patterns of players. Therefore, future studies should take these parameters into account to determine the influence of other contextual variables on the game patterns of professional players.

## Conclusions

In conclusion, this study shows how the type of point, specifically the golden point, causes a greater duration and number of lobs in padel compared to the rest of the points, both in the men's and women's categories, not observing changes in the intensity of the game, understood as the number of shots per second.

Finally, the number of games throughout the set does not seem to affect the external load in professional padel, with the type of point played on game parameters being much more influential than the game number within the set.

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