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JUMPING OBSTACLES: THE LINK BETWEEN THE GENDER OF THE RIDER AND FAULTS COMMITTED AT BEGINNER OR INTERMIDATE EVENTS

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SUMMARY

Equestrian sport is the only Olympic sport in which male and female competitors participate next to one another. The aim of this study was to analyze whether there is a link between the gender of the rider and performance, as well as whether there is a statistically significant difference between male and female riders at the beginner and intermediate level of competition in terms of jumping obstacles. The variables selected for analysis were the knock down, refusal, a fall in the parkour, faults committed during an approach on a straight line and an approach on a curve, faults committed in relation to the color of the obstacle, faults committed at single and combination obstacles, faults committed at the staccionata, oxer, and Liverpool, and faults committed during the double and triple jump. The performance indicator was defined as an outcome with no faults or an outcome with a fault committed during the jump. The analysis included 256 take-offs, from 12 jumping events at open regional club competitions of the CSN – A* category in 2022, held in Zagreb, and the CSN – A** category in 2023, held in Osijek. In total, 3065 jumps over 2683 obstacles were analyzed, 2345 of which were single and 329 combination. The results indicated a weak correlation between the gender of the rider and the performance indicators, whereby the Mann-Whitney U test did not determine a statistically significant difference between the gender of the riders when it came to the faults committed in relation to the studied variables. The number of female competitors is greater at the beginner and intermediate level at jumping events. A weak correlation was identified between the gender of the rider and the faults committed, whereby gender does not impact the performance. The analysis of the performance indicators for jumping obstacles can provide guidelines for coaches and riders alike in their future work with the aim of achieving a more successful sports performance. The analysis could also help the course designers to create a parkour with various levels of nuanced difficulty.

Key words: equestrian sport, jumping events, performance analysis

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INTRODUCTION

One of the most popular equestrian sport disciplines is jumping (Górecka-Bruzda et al., 2011), whereby two morphologically different beings, "a man and a horse", perform in harmony, respecting the principles of the wellbeing of the horse (Clayton & Hobbs, 2017), and with the aim of successfully jumping obstacles which vary in shape, color, and size. The maximization of the dyadic sports success is based on the integrated analysis of the performance of the duo during practice and at competitions, as well as on the cumulative impact of the personality and physical fitness of the rider and the horse (Aegerter et al., 2020). Contemporary equestrian sport is not affected by gender dimorphism, considering that both men and women compete under the same conditions, and without a handicap, competing directly and equally at the same competitions at all levels (Thompson & Nesci, 2016). Historically, equestrian sport was solely a male activity, while today more than 80% of the competitors are women (Pugh & Bolin, 2004). The unique nature of contemporary equestrian sport is that both men and women equally and without a handicap compete in the same events from the beginner to the Olympic level (Whitaker, 2007). The aforementioned specificity negates the stereotype that the equestrian sport is predominantly in the domain of male activities (Alley & Hicks, 2005).

Parkour obstacle heights of 90 cm to 140 cm are included at the beginner and intermediate level of competition, whereby the parkour course designer is tasked with providing each category with the appropriate content, esthetic, and technical level (Ničová & Bartošová, 2022). The results of a study carried out by Whitaker et al. (2012) indicate that there were statistically more women than men competing in America in the West Coast League, pointing out that the specific culturological pattern of each country could lead to variations in the percentage of participation of women compared to men. The percentage of take-offs achieved by women compared to men suggests that equestrian sport has an ambiguous gender stereotype, exceeding gender dimorphism and the perception of the division in sport based on gender (Traeen & Wang, 2006). Equestrian activity is experienced as a pleasant form of physical activity for women (Jagodzinski & DeMuri, 2005). The greater participation of women in equestrian sport may be explained by the fact that various sports are experienced as gender defined, whereby sports with a pronounced masculinization (weight lifting, body-building), group sports (football, rugby, hockey), contact martial arts (wrestling, boxing) are experienced as more suited to men. Sports activities which point out the finer "feminine" physique (riding, swimming, gymnastics) are accepted are more suited for women (Alley & Hicks, 2005). The nature of equestrian sport carries with it certain inherent risks. The analysis of an elite competition, such as the FEI Rolex World Cup, by Whitaker et al. (2012) indicated the greater participation of men, which is congruent with the findings of certain authors that there is a more frequent participation of male riders at the highest levels of competition (heights of 150 cm to 160 cm). Exposure to stress due to balancing between obligations related to elite sportsmanship and familial obligations is multiplied in the case of riders, considering the longevity of their sports career. The combined effect of high risk of injury at the

highest levels of competition and the dominant gender role of the woman in the family and in taking care of children could be one of the explanations for the reduced participation of women compared to men at elite levels of competition (Fraser, 2007; Dashper, 2012). This strongly recognized social role of a woman might lead her to refrain from attempting to achieve success at the elite level (Drew & Humbert, 2012).

Ille et al. (2014), by studying the levels of cortisol, the variability of heart rate frequency, and pressure exerted on the saddle during the jump, concluded that for the studied variables there were no differences related to the gender of the rider. The minimal difference in the pressure on the saddle during the locomotion of the horse was explained as a difference in the weight of the riders of different genders. The horses did not indicate any differences in the level of cortisol, while the variability of heart rate frequency of the horse during increased or decreased intensity of effort did not indicate a difference in relation to the gender of the rider. The authors concluded that there were no essential differences in physical effort, reactions to stress, and pressure during contact with the saddle between male and female riders in the response of the horse to men and women. The aforementioned results suggest that the hours of guided training, aimed at achieving a suitable rider competitive level, probably eradicate any gender, morphological, and physiological differences (Whitaker et al., 2012). The risks during jumping obstacles cause the rider stress. Emotional stability has a positive predictive correlation to resistance to stress, while negative thinking has a negative correlation (Iunganoet al., 2019). Women and men react differently to somatic anxious stress, worry, and reduced concentration during a competitive performance, whereby women manifest more intrusive thoughts compared to men, which thereby hinder performance (Schütz et al.,2023). Facing and applying strategies for the reduction of stress differ between the genders (Hammermeister & Burton, 2004). Male riders rely on higher skill levels to manage anxiety, while female riders do so with more pronounced motivation. A higher level of motivation among women can result in a more extensive and systematic training process, which could make up for the lack of skills related to dealing with stress (Whitaker et al., 2012).

When the rider and horse experience stress at events, as an all-encompassing physical response to the stressors during jumping, it contributes to the occurrence of faults (Borstel et al., 2017). At the same time, horses are not naturally predisposed to jumping, and the more delicate the obstacle, the greater the dilemma of whether to jump (Górecka-Bruzda, et al., 2013). Conflicting behavior which can be manifested in various forms is the reaction of the horse to the difficulties which it cannot overcome successfully (Górecka-Bruzda, et al., 2015). Interaction with horses requires the development of communication skills such as clarity and unambiguity (Traeen & Wang, 2006). Williams and Tabor (2017) indicate that irrespective of the partnership and different types of behavior of the horse, the rider is responsible for the performance of the horse and for managing it. An incorrect interpretation of the physical symptoms of excitement initiates more difficult kinematics of the horse (Powers & Harrison, 2002), which could result in a negative outcome when jumping obstacles (Wolframm & Micklewright, 2010).

Even though it has been pointed out that a performance analysis can contribute

to success at jumping obstacles (Williams, 2013), a small number of studies have analyzed the interaction between the gender of the rider and the parameters of situational efficiency in jumping (Williams, 2013; Ničová & Bartošová, 2022). The analyses of a certain number of authors indicate that the gender of the rider does not have an impact on the results achieved at events. The results of a study carried out by Whitaker (2007) indicate that no significant difference was detected in relation to the gender of the rider ($p = 0.185$) in the final rank of competition (Whitaker, 2007). Whitaker and Hill (2006) determined that the gender of the rider does not have a significant impact on the rate of disqualifications at events. Furthermore, morphological, physiological, and psychological differences between male and female riders do not impact jumping results (Whitaker et al., 2012). By studying the gender subtext in equestrian sport, a number of authors point out that despite the declarative gender neutrality in jumping, the discussion related to providing support to gender equality in public discourse does indicate the existence of differences (Plymoth, 2012; Depret & Jammaers, 2021).

The aim of this study is to analyze whether there is a correlation between the gender of the rider and faults committed at jumping events and whether there is a statistically significant difference between the gender of the riders in relation to their performance indicators. The performance indicator is defined as the outcome with no fault or an outcome with a fault committed during the jump.

METHOD

Sample

The overall sample numbers 256 take-offs, from 12 jumping events at open regional club competitions of the CSN – A* category in 2022, held in Zagreb, and the CSN – A** category in 2023, held in Osijek. Of the total take-offs, 65 were performed by male riders [M (n = 65; 25.4%)] while the female riders performed 191 [F (n = 191; 74.6 %)]. Of the 256 take-offs, over 2683 obstacles, 2345 of which were single and 329 combination, a total of 3065 jumps were realized, of which 1532 over vertical and 1533 over spread obstacles: 1462 staccionata, 1505 oxers, and 98 Liverpool obstacles. Of the 329 combination obstacles, 276 were double and 53 triple jumps. The itinerary included 1046 approaches on a straight line and 2019 approaches on a curve. As part of the two-color combinations, 703 jumps were made over red-white obstacles, 859 over blue-white, 276 over green-white, 1014 over yellow-white, and 200 jumps over black-white obstacles. The height of the parkour obstacles ranged from 90 cm to 140 cm.

Variables

The gender of the rider was the independent variable. The selected performance indicators were the outcome in relation to the knock down (KD), refusal (REF), fall (FALL), the knock down from an approach on a straight line (FCSL) and the knock down from an approach on a curve (FCC) , the knock down of various bi-colored

obstacles (red-white (FRW), blue-white (FBW), green-white (FGW), yellow-white (FYW), black-white (FBLW)), the knock down of single obstacles (FSO), the knock down of combination obstacles (FCO), the knock down of staccionata (FST), the knock down of oxers (FOX), the knock down of the Liverpool (FLI), a knock down during the double jump (FDJ) and a knock down during the triple jump (FTJ).

Procedure

The notations of the outcome were made by the individual bestowed with the status of a judge in equestrian sport, who noted down the penalties on a score sheet during the performance of each competitor. In order to ensure the correctness of the data entry, the data input was compared on site to the data on the video beam and the results recorded by a panel of judges for each competitor. Based on the parkour course sketch, designed by international FEI course designers, the necessary parameters were obtained: the size of the obstacle, the number of obstacles, jumps in the parkour, type of obstacle, type of approach, and the color of the obstacle.

Statistical analysis

Descriptive statistics were calculated. The distribution of the results for the variables was calculated using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test (also known as KS test) is a nonparametric test of the equality of continuousone-dimensional probability distributions that can be used to compare a sample with a reference probability distribution (one-sample KS test). The null distribution of this statistic is calculated under the null hypothesis that the sample is drawn from the reference distribution (in the one-sample case).

The correlation between the gender of the rider and the committed fault was studied using the Spearman correlation of rank. The Mann-Whitney U test was used to discover the statistically significant differences in the indicators of success at jumping events between male and female riders. The level of significance was set at $p < 0.05$, and the statistical program SPSS-19 was used.

RESULTS

Based on Table 1., which provides data for the overall sample, the results indicate that the greatest number of faults, in percentages, was committed when knocking down obstacles (n = 256; KD = 53.1 %). In terms of percentages, there was a greater number of outcomes with a fault during the approach on a curve (FCC = 49.2 %) compared to the approach on a straight line (FCSL = 30.5 %). When the colors of the obstacles were analyzed, the greatest percentage of outcomes with a fault were noted for the yellow-white obstacles (FYW = 29.7 %). A greater percentage of faults were committed at single obstacles (FSO = 53.1 %) than at combination obstacles (FCO = 21.1 %), whereby the percentage of outcomes with a fault is the greatest for the oxer (FOX = 38.3 %). The double jumps accumulated a greater percentage of faults (FDJ = 17.2 %) compared to the triple jump (FTJ = 3.9 %). The normality of distribution of the faults was

studied using the Kolmogorov – Smirnov test (p = 0.00), whereby the results indicate that the assumption of the normality of distribution of the results was not confirmed and had to be rejected. The positive values of skewness (Skew.) indicate that the number of faults is low, while the values of kurtosis (Kurt.) for all the variables, with the exception of the variable the knock down (RP, Kurt = -0.005), indicate that it was pointier than normal, that is, that there were more results grouped around the center of the distribution.

Table 1. Descriptive statistics of the outcome and the number of faults for the entire sample, and the test of normality of the fault distribution

Variables	Outcome	Fre.	(%)	Sum.	K - S test	Sig.	Skew	Kurt
KD	no fault	120	46.9 %	198	0.29	0.00	0.83	- 0.005
	fault	136	53.1 %					
REF	no fault	219	85.5 %	59	0.49	0.00	3.27	10.43
	fault	37	14.5 %					
FALL	no fault	246	96.1 %	10	0.54	0.00	4.79	21.07
	fault	10	3.9 %					
FCSL	no fault	178	69.5 %	99	0.41	0.00	1.87	3.55
	fault	78	30.5 %					
FCC	no fault	130	50.8 %	188	0.29	0.00	1.42	2.38
	fault	126	49.2 %					
FRW	no fault	199	77.7 %	85	0.45	0.00	2.82	8.64
	fault	57	22.3 %					
FBW	no fault	208	81.3 %	54	0.48	0.00	2.67	9.05
	fault	48	18.8 %					
FGW	no fault	225	87.9 %	37	0.51	0.00	3.36	12.99
	fault	31	12.1 %					
FYW	no fault	180	70.3 %	98	0.42	0.00	1.89	4.11
	fault	76	29.7 %					
FBLW	no fault	245	95.7 %	15	0.53	0.00	6.35	46.12
	fault	11	4.3 %					
FSO	no fault	120	46.9 %	213	0.27	0.00	1.32	1.72
	fault	136	53.1 %					
FCO	no fault	202	78.9 %	72	0.46	0.00	2.80	9.15
	fault	54	21.1 %					
FST	no fault	161	62.9 %	125	0.38	0.00	1.31	0.961
	fault	95	37.1 %					
FOX	no fault	158	61.7 %	145	0.36	0.00	1.63	2.35
	fault	98	38.3 %					
FLI	no fault	245	95.7 %	13	0.53	0.00	7.00	61.99
	fault	11	4.3 %					
FDJ	no fault	212	82.8 %	61	0.48	0.00	3.19	11.67
	fault	44	17.2 %					
FTJ	no fault	246	96.1 %	11	0.54	0.00	5.58	33.93
	fault	19	3.9 %					

Legend: N – number of take-offs, Fre. – frequency, % – percentage, Sum – total faults, K-S test – the Kolmogorov-Smirnov test, Sig. – level of significance ($p < 0.05$), Skew. – skewness, Kurt. – kurtosis, KD – the knock down, REF – refusal, FALL – the fall, FCSL – fault committed during an approach on a straight line, FCC – fault committed during an approach on a curve, FRW – fault at a red-white obstacle, FBW – fault at a blue-white obstacle, FGW – fault at a green-white obstacle, FYW – fault at a yellow-white obstacle, FBLW – fault at a black-white obstacle, FSO – fault at a single obstacle, FCO – fault at a combination obstacle, FST – fault at the staccionata, FOX – fault at the oxer, FLI – fault at the Liverpool, FDJ – fault committed during the double jump, FTJ – fault committed during the triple jump.

Based on the data in Table 2., the Mann – Whitney U test (U) did not determine any statistically significant difference between the male or female riders. The correlation between the gender of the rider and the fault committed during a jump was studied using the Spearman correlation of rank, whereby the value obtained for the coefficient 'rho', in accordance with Cohen's guidelines, indicates an exceptionally weak correlation between the gender of the rider and the faults committed during a jump.

Table 2. The Mann – Whitney U test and Spearman's rank coefficient of correlation

Variables	P	Mean Rank	U	Z	Asymp. Sig. (2-tailed)	rho	Asymp. Sig. (2-tailed)
KD	♂	135.88	5727.50	-1.00	0.31	0.06	0.32
	♀	125.99					
REF	♂	119.68	5634.50	-1.82	0.07	0.11	0.07
	♀	131.50					
FALL	♂	127.44	6138.50	-0.40	0.69	0.02	0.69
	♀	128.86					
FCSL	♂	133.65	5873.00	-0.80	0.42	0.05	0.42
	♀	126.75					
FCC	♂	121.35	5742.50	-0.99	0.32	0.06	0.32
	♀	130.93					
FRW	♂	128.06	6179.00	-0.08	0.94	0.00	0.94
	♀	128.65					
FBG	♂	135.52	5751.50	-1.31	0.19	0.08	0.19
	♀	126.11					
FGW	♂	132.54	5945.00	-0.90	0.37	0.06	0.37
	♀	127.13					
FYW	♂	118.87	5581.50	-1.52	0.13	0.09	0.13
	♀	131.78					
FBW	♂	130.78	6059.00	-0.82	0.41	0.05	0.41
	♀	127.72					
FSO	♂	122.66	5828.00	-0.79	0.43	0.05	0.43
	♀	130.49					

FCO	♂	133.78	5864.00	-0.94	0.35	0.06	0.35
	♀	126.70					
FST	♂	126.45	6074.50	-0.30	0.76	0.02	0.76
	♀	129.20					
FOX	♂	131.08	6040.00	-0.376	0.71	0.02	0.71
	♀	127.62					
FLI	♂	128.88	6182.50	-0.14	0.89	0.01	0.89
	♀	128.37					
FDJ	♂	129.42	6148.00	-0.18	0.86	0.01	0.86
	♀	128.19					
FTJ	♂	131.35	6022.50	-1.07	0.28	0.07	0.29
	♀	127.53					

Legend: P – the gender of the rider, N – number of take-offs, ♂ – male riders, ♀ – female riders, U – the Mann-Whitney U test, Z – the value of the approximation, Asymp. Sig. (2-tailed) – the level of significance ($p < 0.05$), rho – Spearman's rank coefficient of correlation, KD – the knock down, REF – refusal, FALL – the fall, FCSL – fault committed during an approach on a straight line, FCC – fault committed during an approach on a curve, FRW – fault at a red-white obstacle, FBW – fault at a blue-white obstacle, FGW – fault at a green-white obstacle, FYW – fault at a yellow-white obstacle, FBLW – fault at a black-white obstacle, FSO – fault at a single obstacle, FCO – fault at a combination obstacle, FST – fault at the staccionata, FOX – fault at the oxer, FLI – fault at the Liverpool, FDJ – fault committed during the double jump, FTJ – fault committed during the triple jump.

DISCUSSION

At the studied events the women performed a greater number of take-offs (Table 2) (n = 191; 74.6 %) compared to the men (n = 61; 25.4 %), which is congruent with the findings of Douglas et al. (2012) that the greater participation of women is clearly visible at the beginner and intermediate levels of competition. The results (Table 2) indicate a very weak correlation between the gender of the rider and the faults committed, while no statistically significant difference was determined for the faults committed between men and women. The lack of a statistically significant difference in the performances between the gender of the riders in this study is similar to the findings of Whitaker et al. (2012), who point out that no significant difference was determined between the ranks of men and women and the number of achieved points. Wolframm and Micklewright (2010) in their study did not determine any significant differences in performances between the genders. It is possible that morphological (Wells, 2007) and physiological (Harms, 2006) differences among male and female riders impact the type of riding, which triggers certain responses from their horses.

The total number of knock downs (Sum = 198) (Table 1) was detected for 53.1 % of take-offs compared to the total take-offs (n = 256), whereby the men performed a slightly greater number of knock downs [(♂ Mean Rank = 135.88); (♀ = 125.99)], but with no statistically significant difference in relation to the women RP (U = 5727.50; Z = -1.00; p = 0.31)(Table 2). A very weak correlation was noted between

the gender of the riders and the knock down (rho = 0.06). In relation to the total take-offs, refusal was noted in 14.5 % of take-offs, and falls in the parkour for 3.9 % of take-offs, without a statistically significant difference in relation to the gender of the rider, and with a very weak correlation between the gender of the rider and the faults. Shape, size, and position in relation to the other obstacles, and the color of the obstacles can demotivate a horse from jumping. Poor positioning of the horse in the final phase of the approach by the rider can lead the horse into a risky situation, with the ultimate outcome of the reactive avoidance of jumping (Górecka-Bruzda et al., 2013). A somewhat greater number of refusals was recorded for female riders [♂ Mean Rank = 119.68; ♀ = 131.50], which might be explained by the avoidance of an excessively risky situation with a potentially physically dangerous outcome, due to increased worry regarding health, initiated by the obligations imposed by the dominant gender role of the woman in the family (Fraser, 2007; Dashper, 2012). The results obtained are supported by the findings of Whitaker and Hill (2006) and Wolframm and Micklewright (2010), who in their studies detected a correlation between the gender of the rider and faults committed at obstacles. Considering that the jumping outcome is the result of the interactive relationship within the "rider – horse" dyad (Powers & Harrison, 2004), whereby the natural lack of a predisposition on the part of the horse to jump is overcome (Górecka-Bruzda et al., 2013), along with the morphological and physiological differences between the genders (Harms, 2006; Wells, 2007), it can be assumed that the riders were prepared and determined to complete the parkour course. The semi-seated position of the rider during the jump, whereby the head of the rider is approximately 280 cm from the ground, the average weight of the horse of 650 kg, the speed of movement of up to 40 km/h, the reactivity of the horse with a possible exerted force of 1000 N per leg can all explain the reasons for the fall of the rider during the course as a result of great inertia during the take-off phase when the horse is preparing to jump over an obstacle (Havlik, 2010).

The itinerary of the parkour course consists of an approach on a straight line (FCSL) and an approach on a curve (FCC), during which riders can achieve various outcomes. Irrespective of the fact that an approach on a straight line does lead to a somewhat greater number of faults committed among the male riders [♂ Mean Rank = 133.65; ♀ = 126.75], while an approach on a curve leads to more faults committed among the female riders [♂ Mean Rank = 121.35; ♀ = 130.93], no statistically significant differences were noted between the genders for the different approaches, whereby a very weak correlation was noted between the gender of the riders and the outcomes with a fault during an approach on a straight line and on a curve (table 2.). Ničová and Bartošová (2022) point out that the results of their study did not determine a significant difference between the males and females during their analysis of faults committed during an event. Of the total take-offs, 30.5 % included an outcome with a fault during an approach on a straight line, while 49.2 % of take-offs included a fault during an approach on a curve (table 1.), which is supported by the results of the study by Stachurska et al. (2002) who emphasize that a greater number of knock-downs were made from an approach on a curve than from an approach on a straight line. Williams (2013) also pointed out that a greater number of faults was committed at

obstacles during an approach on a curve compared to an approach on a straight line. The frequency and length of the gallop, the position of the center of gravity, and the component of inertia behave differently during transition along various trajectories, which might initiate various outcomes for the jump (Powers & Harrison 2002). An outcome with faults committed during an approach on a curve can also be explained by the limited visual information which the rider, relying on stimuli and "a good eye", should be able to transform into the locomotion of the horse, in order to optimize the outcome (Williams, 2013). Marlin and Williams (2020) cite that an approach on a straight line at a right angle diminishes the possibility of a fault by 48 % ($p = 0.00$) compared to an approach from an angle. It is well-known that riders, during the course of the training and competitive treatment, devote insufficient attention to the inherent lateral preference of the horse, which can result in more difficult locomotion during movement on a curve, creating a predictable difficulty for a poor outcome (Byström et al., 2020). The results indicate that it would be desirable to, through advanced work with horses, respect the principles of the horse's wellbeing, to pay attention to the lateralization of the brain activity, and body asymmetry (Vallortigara & Rogers, 2005). A horse has monocular and binocular vision. Maybe even the fact that the rider and the horse have different ways of looking is impactful, whereby the range of the binocular frontal field of vision of the horse ranges from 55° to 65° with a 75° overlap in the field of vision below the head (Timney & Macuda, 2001), and where the ability of interocular transfer can impact the outcome of the jump along different trajectories.

Dichromatic vision gives the horse the possibility to distinguish colors within shades of grey (Spaas et al., 2014). The results obtained in this study indicate that the correlation between gender and faults related to the color of the obstacles is very weak, and no statistically significant difference was noted for the faults between the genders. These results are congruent with those obtained in the study by Ničová and Bartošová (2022), who cite that gender did not have an impact on faults committed during a jump. In terms of percentages, the most frequently knocked over obstacle was the yellow-white one (29.7 %) and the least frequently the black-white one (4.3 %) (Table 1) Stachurska et al. (2002) cite that the most faults were committed at obstacles of the color white, blue-red, green-blue, and brown-red. Brooks and Matthews (1999) indicate that horses note the color red with less acuity, unlike the colors yellow and blue. It is assumed that the expressed color differentiation between the anterior and poster, upper and lower plane of the obstacle can contribute to various outcomes. When color is an aggravating factor in the perception of the horse, the chances of a negative outcome of the jump increase (Paul & Stevens, 2020).

In this study, a very weak correlation was determined between the gender of the rider and the faults committed at individual and combination obstacles, whereby no statistically significant difference was noted for the faults committed between riders of different genders, which is congruent with the findings of Ničová and Bartošová (2022) and Stachurska et al. (2002). Hours of riding can bring the competencies of riders of different genders to the same level, wiping out gender dimorphism which can explain the findings (Whitaker et al., 2012). The results indicate that a greater

percentage of faults were committed at single than at combination obstacles (Table 1), which differs from the findings of Stachurska et al. (2002), who point out that most of the faults were committed at combination obstacles. Combination obstacles are more difficult to jump, whereby they can lead to additional focus on jumping them successfully during the training process and the creation of additional motivation for the successful outcome at jumping events. A combination obstacle consists of two or three obstacles, which requires a higher level of visual attention than single obstacles. A higher level of focus and additional effort for overcoming obstacles can explain the lower percentage of faults committed at combination obstacles (Marlin & Williams, 2020). The results of this study indicate that there was no statistically significant difference between the genders for the double and triple jump, while a very weak correlation was noted between the gender of the rider and the faults committed for the double and triple jump.

No correlation was noted between the gender of the riders and faults committed at the staccionata, oxer, and the Liverpool obstacle, nor was a statistically significant difference noted in the outcomes between genders, which is congruent with the findings of Ničová and Bartošová (2022), who determined that the gender of the rider did not have an impact on the outcome. The somewhat greater percentage of faults committed at the oxer compared to the staccionata can be explained by the fact that more energy for the jump is needed to overcome the vertical-spread dimensions of the oxer than just the verticality of the staccionata (Clayton et al., 2021). The design of the flat oxer with decreased visibility of the final element which defines the spread could lead to more frequent faults being committed at the oxer compared to the staccionata (Ničová & Bartošová, 2022).

CONCLUSION

The study identified a weak correlation between the gender of the rider and performance at beginner or intermediate levels of competition. Even though there are minimal differences in the performances between the genders, the results did not determine a statistical significance. Based on the level of competition, the greater participation of women was expected, considering that riders of both genders reacted almost identically to certain criterion situations, leading to the conclusion that their competencies are the same. It could be concluded that the morphological, physiological, and psychological differences between the genders will not have an impact on performance. The results obtained indicate that the strategy related to jumping parkour obstacles between the genders did not differ significantly, which indicates shared elements in the approach to riding at this level. Due to the fact that the horse is an important part of the competitive dyadic relationship, a better understanding of its nature and improved training could lead to a better performance, irrespective of the gender of the rider. The impact of the horse on the performance should not be overlooked. This study focuses on a limited level of competition, and events which took place on two locations and at different points in time. The analysis of the factors of various locations and temporal conditions should be used to better

understand the factors which impact performance. The inability to isolate the impact of the horse and the environment in this study could be pointed out as a limitation. Future studies should focus on whether the effects are consistent between the levels of competition, the gender of the riders, the impact of the horse, and the impact of the environment. An analysis of the performance indicators in jumping can provide guidelines for trainers and riders alike for further work with the aim of more successful jumping. The analysis could also help the course designers to create a parkour with various levels of nuanced difficulty.

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