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THE INFLUENCE OF AUDIENCE IN SPORTS: DIFFERENCES BETWEEN RIO 2016 AND TOKYO 2020 PARALYMPIC GAMES

La influencia del público en los deportes: diferencias entre Río 2016 y Tokio 2020

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Abstract

The recent COVID-19 pandemic forced the Tokyo 2020 Paralympic Games to be held a year later and with restrictive measures for athletes, staff, and organizers. One of the most significant restrictions was the absence of an audience, which created a unique condition for the event. This study aimed to compare the results of different sports between the Rio 2016 Paralympic Games (held with the audience) and the Tokyo 2020 Paralympic Games (held without the audience). The results from both editions of the Paralympic Games were obtained from the historical archive of the International Paralympic Committee. To conduct the analysis, two mathematical calculations were utilized: a market share (MS) and a sport performance share (SPS). A comparison between the two macro-categories of subjective and objective sports was carried out. In case of any significant change, each sport within the macro-category was analyzed individually. The independent samples Welch t-test was employed to compare the SPS values. Significant changes were observed only in the objective sports between the two Paralympic Games editions (p<0.001), with the highest changes noted in swimming and athletics (p<0.001). Although the effects varied only between objective sports and among some sports analyzed, our study demonstrates the influence of the audience on sports performance in Paralympic athletes. These results could be of interest to sports psychologists and mental coaches focusing on psychological training in high-level athletes, particularly in managing audience support.

Keywords: Sports performance; Paralympic Games; Paralympic sports; Paralympic athletes; Disability; COVID-19 pandemic.

Resumen

La reciente pandemia del COVID-19 obligó a que los Juegos Paralímpicos de Tokio 2020 se celebraran con un año de retraso y bajo estrictas medidas de restricción para deportistas, personal y organizadores. Una de las restricciones más significativas fue la ausencia del público, una condición peculiar y única hasta el momento. Este estudio tuvo como objetivo comparar los resultados de diferentes deportes entre los Juegos Paralímpicos de Río 2016 (con la presencia de público) y los Juegos Paralímpicos de Tokio 2020 (sin la presencia de público). Los resultados de las dos ediciones de los Juegos Paralímpicos se obtuvieron del archivo histórico del Comité Paralímpico Internacional. Para proceder al análisis se utilizaron dos cálculos matemáticos: una cuota de mercado (MS) y una cuota de rendimiento deportivo (SPS).

Por lo tanto, se realizó una comparación entre las dos macro categorías de deportes subjetivos y objetivos. En caso de cambio significativo, se analizó cada deporte dentro de la macro categoría. Se utilizó el t-test para muestras independientes para comparar los valores SPS. Solo los deportes objetivos mostraron un cambio significativo entre las dos ediciones de los Juegos Paralímpicos (p<0.001) y, entre estos, los mayores cambios se encontraron en natación y atletismo (p<0.001). Aunque los efectos encontrados varían entre las macro categorías y los deportes analizados, nuestro estudio demuestra la influencia del público en el rendimiento deportivo de los deportistas paralímpicos. Estos resultados podrían ser de interés para los entrenadores deportivos, así como para los psicólogos o mentores que trabajan en el entrenamiento psicológico de deportistas de alto nivel, con el fin de gestionar el apoyo del público.

Palabras clave: rendimiento deportivo; Juegos Paralímpicos; deportes paralímpicos; atletas paralímpicos; discapacidad; pandemia COVID-19.

Introduction

The Paralympic Games are the equivalent of the Olympic Games for athletes with disabilities and were established during the Second World War (Legg, 2018). A significant milestone in the development of the Paralympic Games can be identified in 1944, when Dr. Ludwig Guttmann, neurologist, and director of the Spinal Injuries Centre of the Stoke Mandeville Hospital in England, organized the first games for war veterans with amputations and spinal cord injuries (Matthews et al., 2014). These Games evolved into an annual event that attracted large international participation, later becoming known as the International Stoke Mandeville Games (Frankel, 2012; Gold & Gold, 2007; Schültke, 2001). Since 1960, there have been numerous attempts to combine the Paralympic Games with the Olympic Games, but these efforts were initially unsuccessful. Only since 1988 this process has been implemented, allowing Paralympic athletes to compete in the same facilities as Olympic athletes (Gold & Gold, 2007). This change has created a growing interest among researchers in the performances, methodologies, and evaluation techniques of Paralympic athletes (Petrigna et al., 2020; Petrigna et al., 2023). The International Paralympic Committee (IPC) governs the Paralympic Games (assuming the same role as the International Olympic Committee (IOC) for the Olympic Games). The IPC organizes the Summer and Winter Paralympic Games, supervises and coordinates international events, and manages the functional classification of athletes (Tweedy et al., 2014; Tweedy & Vanlandewijck, 2011). The number of participating athletes in the Paralympic Games has increased over the years, and more sports have been included in the various editions of the Games (Leale et al., 2023; Petrigna et al., 2020; Petrigna et al., 2023). For instance, at the London 2012 Paralympic Games, 4.200 athletes from 150 countries competed in 20 different sports (Baumgart et al., 2021; Jacinto et al., 2022).

The Tokyo 2020 Paralympic Games were unique and unrepeatable compared to the previous editions due to the absence of the audience. According to the original schedule, this edition was supposed to take place between August 25th and September 2nd, but due to health and safety reasons, the IPC announced the postponement to the summer of 2021. Consequently, the Tokyo 2020 Paralympic Games took place under the hottest conditions in the history of the event (Millet et al., 2022). However, in the summer of 2021, the COVID-19 pandemic was not yet over, which lead to the implementation of specific safety measures (Fernández-Cortés et al., 2024; Giustino et al., 2020; Gjaka et al., 2021). With the outbreak of the COVID-19 pandemic, governments imposed increasingly extensive containment strategies, which also affected sports. These measures included social distancing, travel restrictions, restricted access to training facilities, and limitations on team training activities, all of which had the potential to negatively impact on mental and physical health of athletes. In this context, telecoaching emerged as an innovative solution during the COVID-19 pandemic to address the restrictions on traditional training methods (Leale et al., 2024a; Leale et al., 2024b; Leale et al., 2024c). Utilizing digital platforms, telecoaching enabled athletes to continue their training programs under the guidance of their coaches despite lockdowns and social distancing measures (University of Colorado, 2016; Leale et al., 2025). However, although some studies indicated that restrictions led to a significant increase in physical activity and sports participation (Lee et al., 2020; Meyer et al., 2020), several others showed a significant decrease during the pandemic

(Evenson et al., 2023; Wunsch et al., 2022, Hokstad et al., 2023). However, the specific safety measures adopted during the Tokyo 2020 Paralympics Games could have impacted the sports performance of athletes. In detail: a) the one-year postponement of the Games made it necessary to adjust the physical preparation of the athletes; b) the permanence allowed in Japan was limited, leading to issues related to jet lag and cultural adaptations; c) the implementation of security checks, the requirement for social distancing, and the obligation to use the mask could have affected the psychological and physical well-being of the athletes (Olin et al., 2022); d) the Games were held without the presence of the audience (Millet et al., 2022). The latter is a variable that deserves further investigation. Historically, it has been believed that the presence of the audience can significantly influence the performance of athletes in sports. The first studies on this topic were conducted in 1920s and showed signs of audience influence on specific motor and cognitive tasks (Gates & Psychology, 1924; Laird, 1923). In particular, the results by Gates et al. (1924) indicated that the subjects most affected by the presence of the audience were those who initially had a higher level of performance (Gates & Psychology, 1924). These results were aligned with previous findings by Laird et al. (1923) which suggested that the presence of the audience caused a reduction in motor control, considering it a stimulus of disturbance (Laird, 1923). In 1965, a model of social facilitation was developed based on the drive theory, according to which the performance of subjects is altered by the presence of the audience, which causes psychological arousal (Zajonc, 1965). Moreover, the presence of the audience, particularly its support, is considered one of the main factors in determining the "home advantage", which refers to the advantage of the country hosting the sporting event in terms of winning medals. Nevill et al. (2012) identified the audience as a key factor contributing to improved sports performance and the consequent increase in the number of medals won by the host country (Nevill et al., 2012). This phenomenon has been documented in various other international sporting events, suggesting that the advantage for the host team's advantage is the result from judge bias (Balmer et al., 2001; Franchini & Takito, 2016; Nevill et al., 2012; Ramchandani & Wilson, 2012). On the other hand, the results of the study conducted by Jiménez Sánchez et al. (2021) did not generally support the theory of social facilitation, but supported its relationship with aggressiveness in local players and even with refereeing decisions. Overall, the psychological processes and the components involved (i.e., athletes, judges, staff) remain unclear.

To date, there has been no opportunity to analyze the impact of the absence of the audience during sporting events, a unique condition that emerged during the COVID-19 pandemic. Therefore, this study aimed to examine the effects of the audience absence on sports performance in Paralympic athletes by comparing the results from the Rio 2016 Paralympic Games (with the presence of the audience) and the Tokyo 2020 Paralympic Games (with the absence of the audience). We categorized the sports into two groups: subjective sports (evaluated by a judge) and objective sports (evaluated through technological tools) (Balmer et al., 2003). Moreover, we investigated any differences in performance across the various sports in the two editions of the Paralympic Games. We hypothesized that the absence of the audience could affect athletes' sports performance.

Materials and methods

Data

The results of the Rio 2016 and Tokyo 2020 Paralympic Games were obtained from the historical archive of the International Paralympic Committee (https://www.paralympic.org/results/historical) and recorded in Microsoft Excel® (Microsoft Corp., Redmond, WA).

We recorded the number of gold, silver, and bronze medals, as well as the number of athletes from each country and for each sport.

Table 1 reports the number of events for each sport during both the Rio 2016 and Tokyo 2020 Paralympic Games.

Table 1. Number of events during the Rio 2016 and Tokyo 2020 Paralympic Games.

Sport	Number of events	
	Rio 2016 Paralympic Games	*Tokyo 2020 Paralympic Games*
Archery	9	9
Athletics	177	167
Boccia	7	7
Badminton	0	14
Canoeing	6	9
Cycling	50	51
Equestrian	11	11
Football-5-a-side	1	1
Football-7-a-side	1	0
Goalball	2	2
Judo	13	13
Powerlifting	20	20
Rowing	4	4
Sailing	3	0
Shooting	12	13
Swimming	152	146
Triathlon	6	8
Taekwondo	0	6
Table Tennis	29	31
Volleyball	2	2
Wheelchair Basketball	2	2
Wheelchair Fencing	14	16
Wheelchair Rugby	1	1
Wheelchair Tennis	6	6
Total	528	539

Table 2 reports the number of medals obtained for each sport during the Rio 2016 and Tokyo 2020 Paralympic Games.

Table 2. Number of medals obtained during the Rio 2016 and Tokyo 2020 Paralympic Games.

Sport	Number of medals	
	Rio 2016 Paralympic Games	*Tokyo 2020 Paralympic Games*
Archery	27	27
Athletics	530	501
Boccia	21	21
Badminton	0	42
Canoeing	18	27
Cycling	150	153
Equestrian	33	33
Football-5-a-side	3	3
Football-7-a-side	3	0
Goalball	6	6
Judo	52	52
Powerlifting	60	60
Rowing	12	12
Sailing	9	0
Shooting	36	39
Swimming	457	439
Triathlon	18	24
Taekwondo	0	24
Table Tennis	87	124
Volleyball	6	6
Wheelchair Basketball	6	6
Wheelchair Fencing	42	48
Wheelchair Rugby	3	3
Wheelchair Tennis	18	18
Total	1597	1668

To compare the results of the two Paralympic Games, only the sports played in both editions were taken into consideration.

Procedure

The method used to analyze the sports performance of countries was adapted from the approach developed by Wilson and Ramchandani on the Summer Paralympic Games (Wilson & Ramchandani, 2017). In their study, each country was assigned a total score based on the medals obtained during the competition as follows: 3 points for each gold medal, 2 points for each silver medal, and 1 point for each bronze medal.

Through the total score, we calculated two measures that we describe below in two distinct steps of our procedure.

Step 1: Market Share (MS) determination

Based on the study by Wilson and Ramchandani (Wilson & Ramchandani, 2017), MS was calculated to identify the most influential countries in the medal table. The MS represents the percentage of points obtained by a country out of the total points available in a Paralympic Games, considering that the attribution of the points has been assigned as indicated above (i.e., 3 points for each gold medal; 2 points for each silver medal; 1 point for each bronze medal). For example, Italy's MS at the recent Paralympic Games can be calculated as follows: the total number of points obtained by Italy was 126 (i.e., 42 points for gold medal + 58 points for silver medal + 26 points for bronze medal) while the total number of points awarded in this edition was 3286 (i.e., the points obtained by all countries). Thus, Italy's MS was 3.83% (i.e., 126/3286 *100).

The MS was calculated for the Tokyo 2020 Paralympic Games and only countries with a MS within the 75th percentile were considered for this study. This criterion was established due to the excessive fragmentation of the results, the limited number of athletes below the 75th percentile, and the subsequent impossibility of applying the chosen techniques for those below this threshold. Moreover, countries that participated in only one edition of the Paralympic Games were excluded from our analysis.

Step 2: Sports Performance Share (SPS) determination

After identifying the countries within the 75th percentile, SPS was calculated. Specifically, the total score of each sport was divided by the number of athletes participating in that sport. First, sports were categorized into two macro-categories: objective sports and subjective sports. This classification was based on the nature of how the sports are evaluated; subjective sports are evaluated by a judge, while objective sports are evaluated by technological tools (Balmer et al., 2003). In detail, the results of subjective sports could be altered by the pressure that the audience places on the judgment of the referees (e.g., football-7-a-side). This influence could not occur in objective sports, where the results are determined by measuring components, such as the photocells (e.g., swimming).

The SPS was then calculated for each macro-category and for both the Rio 2016 and Tokyo 2020 Paralympic Games. Subsequently, the SPS was calculated for each sport and for both editions of the Paralympic Games.

Statistical analysis

Concerning the size of the groups compared (i.e., the number of athletes who participated in each Paralympic Games edition by sport), it was not necessary to test the assumption of normality.

As we did not have individual data on athletes but rather aggregate-level, the paired t-test was not applicable. Instead, the independent samples Welch t-test was used to compare the SPS values. In case of significant differences (p<0.05) between the macro-categories of the two Paralympic Games editions, the independent samples Welch t-test was further used to compare the SPS values for each different sport within the respective macro-category (objective or subjective).

R 4.2.0 (Nielsen, 2003) and the weights package (Pasek, 2021) were used for the analysis.

Results

As shown in Table 1, there was a slight variation in the total number of events played between the Rio 2016 and Tokyo 2020 Paralympic Games. Specifically, the Rio 2016 Paralympic Games featured 160 participating countries with 83 of these nations winning at least one medal. A total of 528 events were conducted across 22 sports, culminating in 1597 medals awarded. In contrast, the Tokyo 2020 Paralympic Games saw participation from 162 countries, with 86 nations earning at least one medal. This edition included 539 events across the same 22 sports, resulting in a total of 1668 medals awarded. Further details can be found in Table 2.

Additionally, Figure 1 shows that 17 out of the 164 participating countries achieved a MS within the 75th percentile.
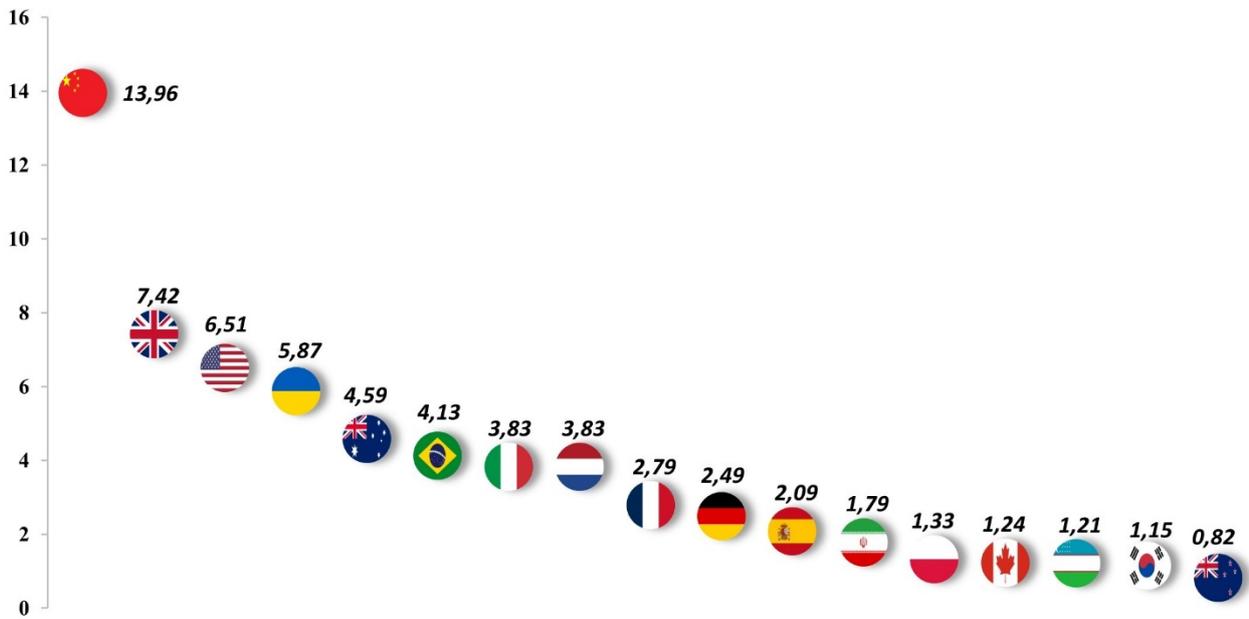

Figure 1. Market Share of countries within the 75th percentile.

These 17 countries were selected for the subsequent analyses, which included a total of 2083 athletes.

Following the identification of these countries, the SPS was calculated for both the Rio 2016 and Tokyo 2020 Paralympic Games to facilitate comparisons. As detailed in Table 3, a total of 20 sports were considered in the analysis, comprising 11 objective sports and 9 subjective sports. Sports such as football 7-a-side, sailing, badminton, and taekwondo were excluded from the analysis due to their inclusion in only one of the two editions.

Table 3. Descriptive analysis of the Rio 2016 and Tokyo 2020 Paralympic Games.

Sport	Category	TP (Rio 2016)	M±SD (Rio 2016)	NA (Rio 2016)	TP (Tokyo 2020)	M±SD (Tokyo 2020)	NA (Tokyo 2020)	NC
Archery	O	39	3.25±4.99	78	29	2.41±4.94	67	12
Athletics	O	668	39.29±37.97	544	577	39.29±28.83	488	17
Boccia	O	17	2.42±2.37	44	12	1.71±1.38	39	7
Canoeing	O	32	2.28±3.31	44	46	3.28±4.27	56	14
Cycling	O	262	16.37±15.36	147	240	15.00±16.04	140	16
Equestrian	O	45	5.00±9.68	40	41	4.55±6.17	34	9
Football-a-5	S	5	1.66±1.73	24	3	1.00±1.73	22	3
Goalball	S	6	0.85±1.21	66	7	1.00±1.29	58	7
Judo	S	60	5.00±5.39	69	46	3.83±3.24	53	12
Powerlifting	O	44	3.66±6.71	58	61	5.08±9.24	59	12
Rowing	O	23	1.76±2.80	70	19	1.46±1.71	66	13
Shooting	O	45	2.81±5.37	81	40	2.50±4.29	76	16
Swimming	O	794	49.62±54.99	366	606	37.87±34.89	328	16
Table Tennis	S	133	10.23±13.88	159	169	13.00±15.91	143	13
Triathlon	O	35	3.18±3.03	44	43	3.91±3.75	62	11
Volleyball	S	9	1.50±1.38	120	9	5.40±1.38	95	6
Wheelchair Basketball	S	12	1.33±1.94	168	13	1.44±1.59	167	9
Wheelchair Fencing	S	62	6.2±11.84	62	73	7.30±13.99	56	10
Wheelchair Rugby	S	5	1.25±1.50	48	5	1.25±1.50	48	4
Wheelchair Tennis	S	33	2.75±4.09	59	29	2.41±4.52	56	12

Legend. O, objective sport; S, subjective sports; TP, Total Point; M, mean; SD, standard deviation; NA, number of athletes; NC, number of countries.

Furthermore, Table 3 provides details on the total point awarded to countries for each sport, the number of participating athletes, and the number of countries included in the analysis. These parameters were calculated for both editions of the Paralympic Games.

Table 4 shows the results of the Welch t-test between the two Paralympic Games editions for objective and subjective sports. The analysis showed a significant change between the Rio 2016 and Tokyo 2020 Paralympic Games exclusively for the objective sports ($p<0.001$). In contrast, no significant changes were observed for the subjective sports ($p>0.05$).

Table 4. Welch t-test results between the two Paralympic Games editions for objective and subjective sports.

Sport	SPS Rio 2016	SPS Tokyo 2020	t-value	p-value	N	SE
Subjective	0.42	0.50	-0.72	0.76	1386.70	0.64
Objective	1.32	1.21	7.82	<0.001[***]	2567.29	1.63

*Legend. N, degree of freedom; SE, standard error; *, $p<0.05$; **, $p<0.01$; ***, $p<0.001$.*

Table 5 shows the Welch t-test analysis between the two Paralympic Games editions for each objective sport. Of these 11 objective sports, only 4 showed a significant difference ($p<0.05$) (i.e., athletics, boccia, cycling, and swimming), with the most significant differences found in sports such as athletics and swimming ($p<0.001$).

Table 5. Welch t-test results between the two Paralympic Games editions for each objective sport.

Sport	SPS Rio 2016	SPS Tokyo 2020	t-value	p-value	N	SE
Archery	0.5	0.43	0.20	0.42	133.82	1.02
Athletics	1.22	1.18	5.94	<0.001[***]	974.99	2.32
Boccia	0.38	0.30	2.74	0.004[**]	63.79	0.37
Canoeing	0.72	0.82	-1.36	0.91	97.99	0.87
Cycling	1.78	1.71	2.08	0.02[*]	279.06	1.72
Equestrian	1.1	1.20	0.46	0.32	66.54	0.42
Powerlifting	0.75	1.03	-0.88	0.81	107.96	2.13
Rowing	0.32	0.28	1.46	0.07	111.30	0.41
Shooting	0.55	0.52	0.41	0.34	152.65	0.94
Swimming	2.16	1.84	6.99	<0.001[***]	541.31	3.83
Triathlon	0.80	0.70	-1.95	0.97	103.93	0.71

*Legend. N, degree of freedom; SE, standard error; *, p<0.05; **, p<0.01; ***, p<0.001*

Discussion

This study aimed to investigate the effects of the audience absence on sports performance in paralympic athletes by comparing the results obtained by the different countries at the Rio 2016 (in the presence of the audience) and the Tokyo 2020 Paralympic Games (in the absence of the audience).

The restrictive measures imposed during the pandemic may have influenced the outcomes of the Tokyo 2020 Paralympic Games.

The comparison of the two categories of sports (i.e., subjective and objective sports), revealed a significant difference in the results obtained by athletes only in objective sports. This finding could be related to the effects of the postponement of the Paralympic Games and the subsequent modification of the training program. In contrast, although the influential role played by the audience during a sport competition has been demonstrated (Balmer et al., 2001; Myers & Balmer, 2012), our analysis found no significant differences in subjective sports between the Rio 2016 and Tokyo 2020 Paralympic Games. This indicates that subjective sports did not exhibit changes in performance, even though Balmer et al. (2003) reported differences in results for subjectively judged sports (Balmer et al., 2003).

Previous research has shown that audience noise can alter judges' decisions (Myers & Balmer, 2012), often influencing their judgments in favor of the host country (Balmer et al., 2001; Nevill et al., 2012). Given this context, we anticipated variations in the results of subjective sports due to the absence of the audience. However, the lack of audience at the Tokyo 2020 Paralympic Games did not cause significant changes in sports primarily evaluated by a judge, suggesting that referees maintained their impartial judgment abilities.

Among the objective sports, analysis of the SPS values between the two different Paralympic Games revealed significant differences in athletics, boccia, cycling, and swimming. Of these, the greatest significant differences were observed in athletics and swimming, two of the oldest and most widely participated sports in the Paralympic Games.

High participation rates, competitive nature, significant audience following, and increasing media interest (Ferrara et al., 2015) contribute to increased stress and mental discomfort for these athletes (Marín-González et al., 2022; Martínez-Patiño et al., 2021). Thus, the absence of the audience and the limited number of media that had access to the sports facilities could be two of the main reasons to explain this significant change in terms of results. Specifically, the reduction of these stressors seems to have positively impacted the performance of these athletes, leading to an optimization of their sports performance (Sanchez et al., 2021).

Among the objective sports, the trend reversed in triathlon and canoeing, where a decrease in athletes' performance was observed during the Tokyo 2020 compared to the Rio 2016 Paralympic Games. An explanation can be related to the performance pattern of these endurance sports, which require high physical exertion and are conducted outdoors, often in water. Due to global warming, Tokyo has become one of the hottest cities in the world (Kakamu et al., 2017), and, due to the postponement of the Paralympic Games, the Tokyo 2020 Paralympic Games were held in a very hot and humid environment, exposing athletes to additional stressors (Coudevylle et al., 2019), since high temperature and high humidity cause greater psychological and metabolic tensions (Lei & Wang, 2021). The psychological state of these athletes may have been altered by these meteorological conditions, which may have affected their emotional control, concentration, and motivation, resulting in a decrease in their performance level (Lei & Wang, 2021). Sport performance is closely related to the levels of stress and mental discomfort (Guillaume et al., 2019; Vasmatzidis et al., 2002). Given the critical role of psychological factors assuming an important role in high-level sports, it is essential to recognize that psychological needs vary across different sports (Guillaume et al., 2019). For instance, elevated levels of stress could cause a reduction in accuracy, which is fundamental in archery, while low levels of attention and decision-making ability could affect sports performance in many sports, such as football, basketball, or fencing.

Strengths and Limitations

Although numerous studies in the literature have investigated the role of the audience in sports competitions, there has never been a condition in which a sport event took place without the audience. Our study examined this unique scenario by investigating the first and only Paralympic Games held without the audience. This represents a significant strength of our research. This can improve understanding of the role of the audience in sports and provide valuable insights for future research and event planning. A limitation of this study was the analysis of the sample as independent groups. This approach was necessary due to the lack of access to individual athlete data and medals won by their nations, which prevented us from treating the two editions of the Paralympic Games as paired samples. Another limitation was not analyzing the impact of the absence of the audience on the sports performance of athletes based on the different types of disability. Furthermore, this study did not consider technological advances in equipment that may have affected performance outcomes. Indeed, technological advances leads to the development of new equipment, prosthetics, specialized devices, and wheelchairs that can enhance athletes' performance (Burkett, 2010). Consequently, new technologies used at the Tokyo 2020 Paralympic Games may have contributed to improve performances (Matsuwaka & Latzka, 2019). Similarly, since the results of this study are based on a unique context compared to previous editions, they may have been affected by various external variables that we did not consider, such as psychological, social, cultural, and economic factors. A significant confounding factor is the lack of training experienced by athletes and staff who tested positive for COVID-19.

Practical implications

These results are particularly relevant for sports psychologists and mental coaches. We recommend implementing specific training programs aimed at reducing stress and managing the pressure associated with the presence and support of the audience.

Conclusion

We hypothesized that the absence of the audience could influence sports performance in athletes. The results indicate significant effects primarily in sports that are judged objectively, particularly in athletics and swimming. However, it is important to consider that there may have been many variables that we could not control in our study. Therefore, the role of the audience may be only one of several factors contributing to these results.

In conclusion, it appears that the absence of the audience is an influencing factor in sports performance. However, the effects it generates are not entirely clear and vary among the sports analyzed.

Future studies should further explore this phenomenon to gain a more detailed understanding and contribute to the scientific literature. A subsequent line of analysis could focus on the Winter Paralympic Games or could be extended to the Olympic Games.

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