PERFORMANCE PROFILING ON ARGENTINA MEN'S VOLLEYBALL TEAM AT TOKYO 2020 OLYMPICS

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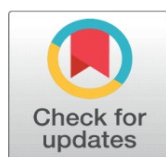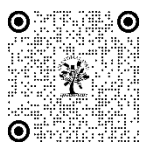
ABSTRACT

This study conducts a comprehensive performance profiling of men's volleyball teams at the Tokyo 2020 Olympics, specifically focusing on both Bronze medal-winning and losing teams. The observation was used to analyze the 34 sets of 8 matches corresponding to the 12 teams participating in the Tokyo Olympics 2020. The performance indicators were performance in all game actions and classifications. The methodology involves analyzing various performance indicators such as attack points, errors, block points, block errors, serve points, serve errors, reception success, reception errors, perfect digs, dig errors, and set errors. Using chi-square statistical analysis, the results showed a significant association between the final classification of reception, setting, attack, block, and defense (p< 0.05) offering nuanced insights into the performance dynamics of men's volleyball. This research provides valuable guidance for coaches and players in refining strategies for future competitions.

Keywords: Men's Volleyball, Performance Profiling, Tokyo 2020 Olympics, Statistical Technique, Team Development

1. INTRODUCTION

In the realm of men's volleyball, strategic gameplay and technical proficiency play pivotal roles in determining a team's success. This study delves into the intricate dynamics of Olympic volleyball matches, specifically focusing on the Bronze medal-winning and losing teams in the Tokyo 2020 Olympics. Analyzing 140 sets across 38 matches involving 12 participating teams, the research seeks to unravel the nuanced aspects of performance indicators that influence the outcome of these highly competitive encounters.

To comprehend the intricate maneuvers on the volleyball court, a thorough investigation into attacking technical actions, especially from zones 2 and 1, becomes imperative. The effectiveness of attacks, particularly after reception and defense, emerges as a critical aspect, shaping the overall game scenarios. Moreover, the strategic movement of the ball within the service area's right back row adds another layer of complexity to the game, influencing offensive plays (Oliinyk et al., 2021; Drikos et al., 2019; Gil Arias et al., 2016).

The role of setters becomes a focal point, with their decisions impacting the team's attack efficiency, especially during rapid attacks. The study notes that only half the time do setters make the correct decisions, underscoring the significance of precise decision-making in the fast-paced environment of competitive volleyball (Silva, Marcelino, et al., 2016). The interplay between the first touch and subsequent plays, coupled with the accuracy of the defense, significantly influences the setter's performance and the team's overall attacking strategy (Stamm, Stamm, Torilo, et al., 2016).

Additionally, the study sheds light on the critical reception areas on the court, emphasizing the formal and functional structures that underpin successful receptions. With specific lanes designated for reception—Lane 1 on the right side, Lane 6 in the middle, and Lane 5 on the left—along with the intermediate seam, where the ball is received, the study underscores the strategic significance of these reception zones (Gil-Arias et al., 2016). The presence of at least two liberos on a volleyball team, and the coach's strategic choices during official matches, further contribute to the team's defensive prowess (Mergheş and Grădinaru, 2014).

In the realm of services, particularly aggressive serves such as power jump serves, are recognized as potential game-changers, often leading to direct points or creating favorable circumstances for executing counterattacks. The perpetual pursuit of flawless execution of fundamental techniques, coupled with innovative strategies, reflects the ongoing evolution in volleyball gameplay. Teams strive for faster passing to attackers, enhanced block effectiveness, robust ground defense, and advancements in service techniques to make receiving the ball more challenging for opponents (Yiannis et al., 2004). The overall performance of the game model's reception, as explored in this study, hinges on both its formal and functional structures (Katsikadelli, 1998).

2. METHODS

The study adopts a meticulous approach to match profiling, focusing on the Bronze medal-winning and losing teams at the Tokyo Olympics 2020. The selection of men's volleyball matches and data collection from the Tokyo Olympics 2022 https://olympics.com/en/olympic-games/tokyo-2020/results/volleyball/men align with the research's overarching objectives. Using Microsoft Office Excel 2007, the percentage of success and attempt in different skills is calculated, offering a comprehensive analysis of offensive and defensive points. Performance indicators such as attack points, errors, block points, block errors, serve points, serve errors, successful reception, reception errors, perfect dig, dig errors, and set errors serve as benchmarks for evaluating team performance.

3. RESULT

The preliminary results of this study present a comprehensive evaluation of Olympic men's volleyball matches, specifically comparing the performance of Bronze medal-winning and losing teams. Notably, team Argentina demonstrates an overall commendable performance across various key performance indicators. The team excels in attack attempts (27%), attack success (12%), block attempts (12%), block success (2%), service attempts (21%), service success (1%), dig attempts (4%), set attempts (11%), and reception attempts (10%). These findings highlight the team's excellence in strategic offensive plays, defensive maneuvers, and overall teamwork, offering valuable insights into their competitive edge during the Olympic encounters.

Table 1 Analysis of chi-square. Mean, standard deviation (SD), results of X^2 value, the significance value (p-value).

PI	Mean	SD	X^2	df	p	Sig
Attack Point	54.750	11.705	91.000	91	0.480	1.000
Attack Error	18.313	5.121	78.667	70	0.224	.975
Block Point	9.938	3.087	41.667	56	0.923	.926
Block Error	27.500	9.359	107.000	84	0.046	1.000
Serve Point	3.375	1.962	49.667	49	0.447	.885
Serve Error	16.688	3.646	50.333	56	0.688	.926
Successful Reception	48.688	14.337	94.000	84	0.214	1.000
Reception Error	3.063	2.043	53.000	42	0.119	.777
Perfect Dig	25.063	8.087	107.000	98	0.251	1.000
Dig Error	26.750	5.348	74.500	63	0.152	.689
Set Error	0.563	0.629	14.821	14	0.390	.068

Table 1 provides the chi-square values of performance indicators concerning the factor "match result." The table details chi-square values, significance values (p-values), and degrees of freedom (df) for all performance indicators. Notably, the team accurately classified 8 matches, encompassing 5 victories and 3 losses. A comprehensive analysis of performance

indicators suggests an overall parity in performance between the teams. Comparison between the Strong team and Argentina reveals no significant differences, aligning with findings by Silva, Marcelino, et al. (2016). However, in contrast to all other teams competing against Argentina, the performance indicators—encompassing attack point, attack error, block point, block error, serve point, serve error, successful reception, reception error, perfect dig, dig error, and set error—remain statistically insignificant. Table 1 underscores that both teams exhibited a uniformly high level of performance throughout the tournament.

Figures: analysis of the performance indicators
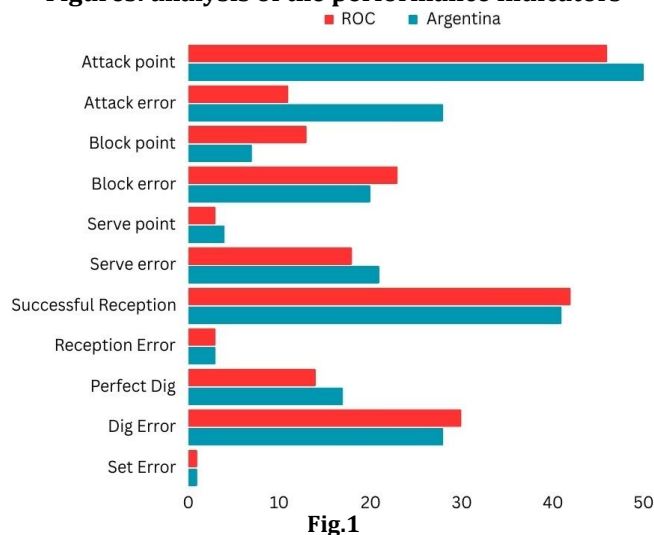
Fig.1

Figure 1 illustrates the performance of teams ROC and Argentina throughout the match. In comparison, the ROC team demonstrated fewer attack points than Team Argentina, coupled with a higher count of attack errors. Remarkably, the ROC team excelled in block points despite Argentina's elevated number of block errors. Furthermore, the serve points for the ROC team were lower than Argentina's, while Argentina faced a substantial number of serve errors. Notably, the ROC team exhibited superior successful reception, with both teams sharing an equal number of reception errors. Argentina outperformed the ROC team in perfect digs, although they also encountered a higher count of dig errors. Lastly, both teams exhibited an identical, maximum level of set errors during the match.
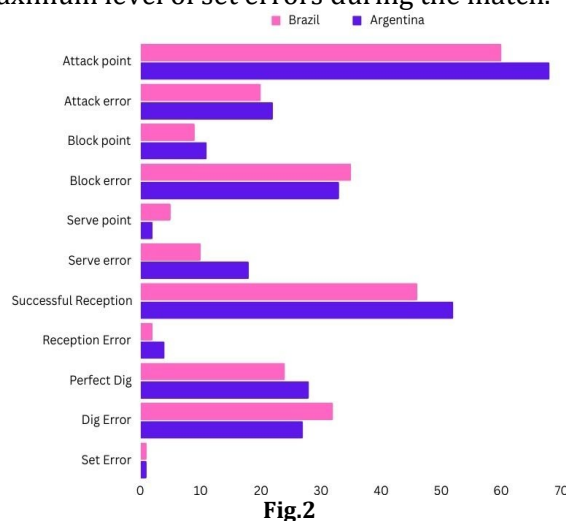
Fig.2

Figure 2 conclusively demonstrates that the team exhibits a superior performance level in terms of attack points, attack errors, block points, successful reception, and perfect digs compared to the Brazil team. Notably, the team outperforms Brazil in these key indicators. However, it is essential to acknowledge that the team experiences higher block errors, serve points, and dig errors in contrast to the performance of Argentina's team. Interestingly, both teams maintain a nearly identical level of set errors, highlighting a comparable performance in this aspect.
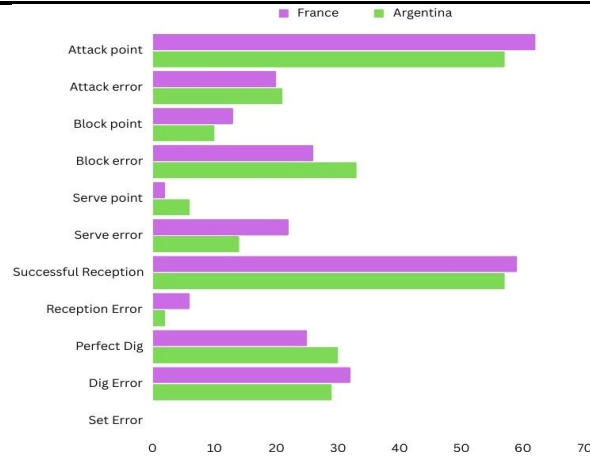
Fig.3

In Figure 3, the performance analysis reveals that Team Argentina demonstrates elevated levels in attack points, block points, serve errors, successful receptions, and dig errors, reflecting their prowess in these aspects. Conversely, Team France exhibits higher counts in attack errors, block errors, serve points, and perfect digs. Overall, the match showcased a balanced performance, with both teams reaching a satisfactory level in various indicators, indicating a competitive encounter.
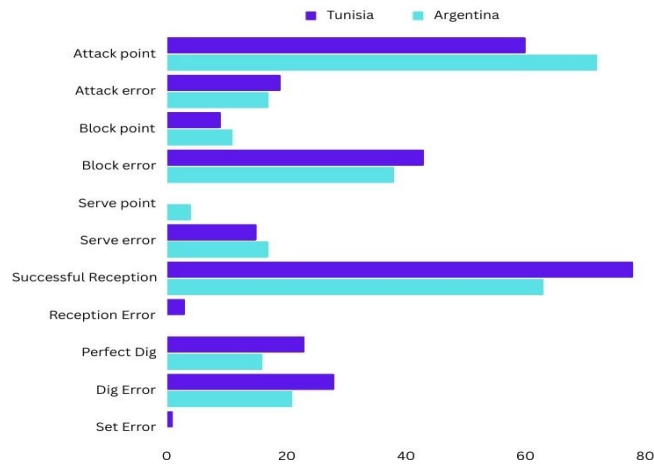
Fig.4

The data depicted in Figure 4 underscores that the Argentinean team exhibits superior performance levels in attack points, attack errors, block points, serve points, and perfect digs in comparison to Team Tunisia. Nevertheless, the Argentinean team records higher levels of block errors, serve errors and successful reception. Despite these variations, the team from Argentina maintains a higher success rate in scoring points sequentially when compared to their counterparts.

Fig.5

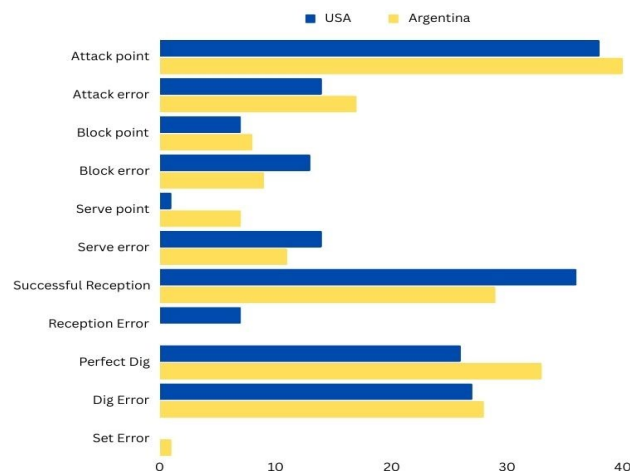The data showcased in Figure 5 reveals that the Argentinean team has excelled in various performance metrics compared to the USA team, including attack points, attack errors, block points, serve points, and perfect digs. Nevertheless, the Argentinean team records higher levels of block errors, serve errors and successful reception. Notably, despite these challenges, the Argentinean team maintains a higher success rate in scoring points consecutively, indicating an overall improvement in their performance compared to the previous match.
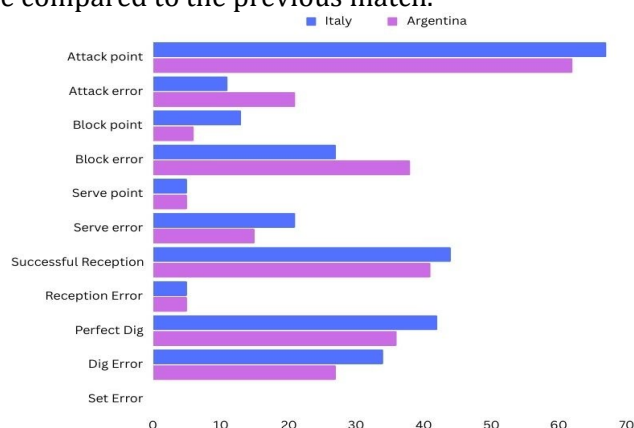

Fig.6

In Figure 6, the performance analysis between the Italy and Argentina teams during the match unfolds. The Italy team demonstrated superiority in attack points over Argentina, accompanied by a lower count of attack errors. Surprisingly, despite Argentina's higher block errors, the Italy team outshone it with a greater number of block points. Furthermore, Italy maintained an equivalent level of serve points as Argentina but exhibited more serve errors. Notably, the Italy team excelled in successful reception, while both teams shared an equal number of reception errors. Italy displayed a superior perfect dig compared to Argentina but grappled with a higher count of dig errors. Notably, both teams executed error-free sets, and the maximum positive result favored Argentina due to errors made by the opposing team.
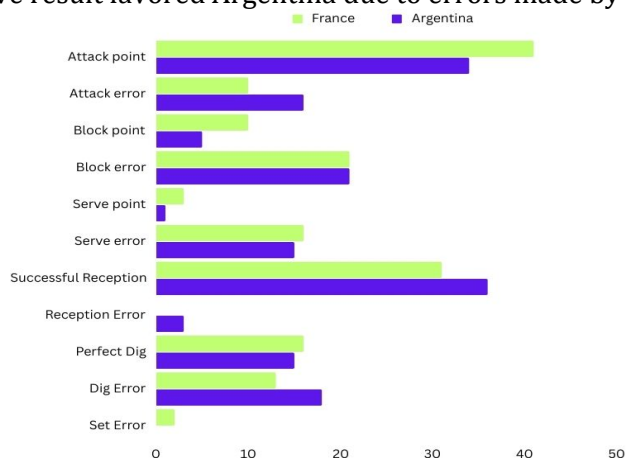
Fig.7

Analyzing the data illustrated in Figure 7 reveals that the Argentina team exhibited an improved performance compared to their second encounter with Team France. Notably, the Argentina team secured fewer attack points than their French counterparts, accompanied by a higher count of attack errors. However, Argentina surpassed in block points while lagging in serve points and perfect digs. Remarkably, both teams shared an identical number of block errors, and the France team incurred more serve errors, maintaining an equal level of successful reception performance as the Argentina team. Despite these variations, the Argentina team recorded a lower rate of successive points compared to Team France.

Fig.8

Examining Figure 8 provides insights into the performance dynamics between the Brazil and Argentina teams during their match. The d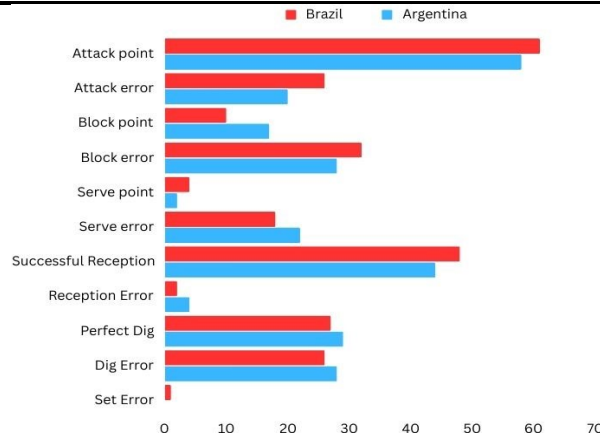ata indicates that Brazil exhibited superior performance in terms of attack points, making fewer attack errors than Argentina. Conversely, Argentina outperformed Brazil in block points, despite Brazil encountering a higher number of block errors. While Brazil achieved a higher level of serve points, Argentina faced more serve errors. The Brazil team excelled in successful reception, whereas Argentina grappled with a higher count of reception errors. Italy showcased a superior perfect dig compared to Argentina but with a higher number of dig errors. Notably, there were no set errors during the match for the Argentina team, securing the maximum positive result owing to errors by the opposing team.

4. DISCUSSION

In the initial match against Russia lasting 2 hours and 9 minutes, Argentina faced challenges in the 3rd set but successfully rallied with Lima, an All-rounder, scoring 12 crucial points. Lima's notable speed of 118 km/h in serving became instrumental in turning points during the match. Substitutions aimed to rectify service errors, with 34 total errors for the team across four sets. The second encounter against Brazil, played over five sets, showcased Lima's stellar performance, scoring 26 points. Despite the third set of challenges, strategic substitutions, particularly involving Lima and Palacios, helped Argentina secure successive points. Lima's service speed of 119 km/h played a vital role in the team's success.

The third match against France played over five sets, witnessed Lima's standout performance with 18 points. Multiple substitutions, including Loser as a middle blocker, contributed to a turning point. The match saw nine substitutions, mainly focused on addressing service errors. Facing Tunisia in the fourth match spanning five sets, Lima's exceptional scoring of 27 points marked a pivotal performance. Substitutions involving Palacios, Lima, and Conte facilitated successive points. Strategic substitutions aiming to address service errors were implemented, leading to victory. In the fifth game against the USA over three sets, Conte emerged as the top scorer with 45 points. Key substitutions involving Lima and Conte played a role in turning the match in favor of Argentina, securing victory.

The sixth match against Italy played over five sets, showcased Palacios as the top scorer with 67 points. Nine substitutions were made, primarily to address service errors. Despite a challenging fourth set, strategic substitutions contributed to Argentina's ultimate triumph. The seventh match against France, spanning three sets, highlighted Conte as the top scorer with 13 points. Six substitutions aimed to reduce service errors, but Argentina faced challenges, ultimately losing the match. In the bronze medal match against Brazil, Argentina's strong performance, with Conte scoring 21 points, secured a victory in five sets. Strategic substitutions, including Lima, Palacios, Conte, and Loser, played a crucial role in overcoming errors and securing the bronze medal.

Analyzing the tournament, Argentina faced a balance between offensive and defensive skills. The team's maximum errors, particularly in service, block, and attack, impacted their position. Despite challenges, the team's adaptability and strategic substitutions, especially against strong opponents, contributed to their success and the acquisition of the bronze medal. Ongoing improvement in minimizing errors will be crucial for Argentina's future competitiveness in international volleyball.

5. CONCLUSION

Argentina's impressive performance in the Tokyo 2020 Olympics Men's Volleyball tournament showcased their determination, adaptability, and exceptional skills, ultimately leading to the team securing a bronze medal.

Lima, Palacios, and Conte: These players played pivotal roles in Argentina's success, utilizing their exceptional skills and strategic versatility to contribute significantly to the team's achievements.

The astute coaching decisions made impactful substitutions to rectify errors and capitalize on specific strengths, highlighting the coach's keen understanding of the game.

Argentina's remarkable attack, block, and service success rates demonstrated their offensive prowess, playing a significant role in their winning moments.

Error Minimization: While Argentina displayed exceptional performance, there's a need to address areas that can be improved, particularly focusing on minimizing errors to ensure continued success on the global volleyball stage.

Argentina's journey in the Tokyo 2020 Olympics Men's Volleyball tournament was commendable, and their bronze medal is a testament to their hard work, promising potential, and determination to succeed at the highest level of competition.

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