Original Article

Influence of technical variables on the victory rates in the 2021 Brazilian National Futsal League

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Abstract:
Futsal is one of the most popular sports in the world, with Brazil being the birthplace of the sport and home to one of the most successful teams and competitive leagues between clubs within the countries. To that end, analyzing the data provided by both game moments and match results is critical to qualify and improve the sport's technical and tactical dynamics. Its intermittent characteristic, presenting varying moments of control and extreme excitement and the possibility of infinite athlete changes, allow structural changes in team formations during the match. This study investigates the impact of the goals, shots, tackles, and assists averages, and right and wrong passes on team victory indices. Furthermore, it quantitatively and descriptively evaluates 154 matches in the qualifying phase of the 2021 Brazilian National Futsal League in which 23 teams competed. The league's official scout collected the data. A descriptive analysis was employed first, followed by a Spearman correlation. When observing the correlations analyzed, a positive and strong correlation was identified between the variables Average Goals/Victory (r = 0.82), Average Help/Victory (r = 0.60), and Average Kicks/Victory (r = 0.60). However, this analysis showed no correlation in the right passes (r = 0.22) and wrong passes (r = 0.08) concerning the victory rates. Thus, we can infer that the teams that have better goal, assist, and kick averages tend to obtain a higher number of victories.
Keywords: Tactical variation, Sport, Training, Physical education

Introduction

Futsal is a sport practiced worldwide and with great appreciation (Romero et al., 2020), especially in South America. The National Futsal League (LNF) in Brazil is one of the most important competitions in the world, growing in popularity among fans and with strong indications of future integration with the Olympic Program.

The LNF was founded in 1996 by the Brazilian Futsal Confederation (CBFS) and was inspired by successful models of leagues in the United States. It was initially known as the Futsal League, and its administration is the union of participating teams since 2014. It is currently the most crucial competition in the Americas, encompassing 7 Brazilian states and attracting 23 professional teams.

With the evolution of the sport, various researchers have analyzed the most diverse leagues and national teams worldwide. For instance, Alvarez-Kurogi (2020) analyzed the technical and tactical fundamentals of the Spanish Futsal National Team, Medina et al. (2018) discussed offensive actions that resulted in goals in two seasons of the Spanish Futsal League, and Abdel-Hakim (2014) identified performance indicators concerning the goals scored in the 2012 Futsal World Cup.

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Performance analysis has been gaining space in technical committees, since the observations made are of fundamental importance for sports performance (Teoldo, Guilherme & Garganta, 2015). This approach enables us to collect data, reflect on such data, and intervene in the athletes' development process, all of which contribute significantly to the formation of these individuals (Moreira et al., 2021).

In the Futsal sports world, the most critical moment of a match is the goal, which can happen through several actions during the match. Souza and Santana (2018) comparatively analyzed the goals in three subsequent LNF editions, presenting data on the tactical context, period, location, and distance from the goal in relation to the goals scored. Understanding these facts can help teams succeed by assisting in corrections during or after the game and allowing for specific trainings (Hobus & Rother, 2021).

Most existing studies perform a temporal analysis of the occurrence of goals; for example, Souza, Alves & Pinheiro (2020) analyzed the offensive actions in the women's college world cup, presenting the final 15 minutes as the most occurring.

Meanwhile, analyzing the influence of technical performance in the match's final result, David, Picanço & Reichert (2014) stated that the Technical Scout allows identifying the team's performance during the matches. They found a link between a positive result and a higher tackle and kicking averages as well as a correlation between wrong passes and defeat rates.

Researchers have recently conducted Futsal games analysis in Brazil to provide coaches with important information about what happens during competitive matches (Massardi, Oliveira & Navarro, 2011; Fukuda & Santana, 2012; Schneider, Voser & Voser, 2015; Oliveira, 2018; Miranda et al., 2019; Silva et al., 2021; Miranda et al., 2021).

Undoubtedly, Futsal is characterized by the development of motor skills in its technical, spatial, and game rules aspects (Iedynak et al., 2019), where the time for analysis, evaluation, processing, and execution is limited compared to other collective sports (Polidoro et al., 2013). Therefore, this sport has several physical demands, such as resistance, speed, strength, and change of direction (Khaosanit et al., 2018).

The development of aerobic capabilities allows gains in levels of strength, agility, balance, and other physical skills. Corroborating the importance of physical development specific to the sport suggests that such development allows for better applicability of the dynamics related to the sport because, during the execution of the tasks, these valences are requested in relative harmony, resulting in mechanical and technical actions consistent with the modality (Soyal, 2023).

A recent study, which analyzed the effects of high-intensity interval training on football athletes' aerobic capacity, showed significant improvements in athletes after four weeks of training. Highlighting the need for this type of activity as the high-intensity demands are increasingly present in sports and having advantageous conditioning tends to imply future success (Ndlomo, 2023). Hence, game analysis is a tool that helps teachers/coaches prepare the training (Schneider, Voser & Voser, 2015) and organize their teams, thus qualifying their pedagogical action (Sadiq, 2021). Furthermore, actions that promote prevention and multidisciplinary interventions are important to keep athletes performing at their maximum performance level and consequently avoiding unnecessary expenditures of time and money (Gene-Morales et al., 2021).

Therefore, this study investigates the impact of goals, shots, tackles, and assists averages as well as right and wrong passes on the winning rates of teams competing in the qualifying phase of the 2021 Brazilian National Futsal League. The main hypothesis is that there is a direct relationship between goals and victories; however, since it is a modality in which the movement of attack and defense is present, other factors, such as tackling, shots on goal, assists, and passes can influence the result of a match.

Materials and Methods
Study design
This is a cross-sectional, quantitative, and descriptive record and document analysis study (Thoma, Nelson & Silverman, 2017).
Sample
Data were obtained from 154 matches in the qualifying phase of the professional category of the National Futsal League in 2021, comprising 14 rounds, held in several Brazilian states. All data were obtained from the open access web domain, the official page of the Brazilian National Futsal League (https://ligafutsal.com.br/).
Procedures
The data were collected by the competition's official scout, who selected the total number of wins, average goals, tackles, assists, and shots and total right and wrong passes of the 23 teams competing in the tournament's qualifying phase.

Following the analysis of the Scouts provided, the data were recorded and organized in a Microsoft Excel spreadsheet without the need for indexing.
Instruments
For data collection, an ASUS computer (model: Asus Laptop M515D) was used. The data were recorded in a Microsoft Excel spreadsheet and later subjected to statistical analysis using the JAMOVI software, version 2.3.2.

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Statistical analysis

A descriptive analysis (mean and standard deviation) and the Shapiro–Wilk normality test were performed. Moreover, Spearman's correlation (nonparametric data) was used to correlate the variables.

Results

With 23 teams competing in the 2021 edition, 154 official matches were held for the qualifying phase. Table 1 presents the mean, standard deviation, and significance values of the variables studied. There were no significant differences ($p < 0.05$) for the samples.

Table 1 – Mean, standard deviation and significance of the variables studied.

	N	Average	Standard deviation	Shapiro-Wilk	
				W	p
WINNERS	23	5.30	2.44	0.95	0.258
GOALS	23	2.56	0.52	0.97	0.738
DISARMS	23	73.82	5.26	0.97	0.763
ASSISTANCE	23	1.45	0.41	0.95	0.268
RIGHT PASSES	23	578.13	113.34	0.94	0.146
WRONG PASSES	23	700.39	97.94	0.95	0.366
SHOTS	23	13.40	2.09	0.99	0.996

Table 2 shows a positive and strong correlation between the variable's average goal/win (r=0.82), average assist/win (r=0.60), and average kick/win (r=0.60). Additionally, presenting an absence of correlation in the variables right passes (r=0.22) and wrong passes (r=0.08) in relation to the victory rates.

Table 2 - Correlation between wins, average goals, shots, assists, tackles, right and wrong passes.

	VIC	GOL	SHO	ASS	TAC	RPA	WPA
VIC	—						
	—						
GOL	0.82 ***	—					
	< .001	—					
SHO	0.60 **	0.68 ***	—				
	0.001	< .001	—				
ASS	0.60 **	0.72 ***	0.36 *	—			
	0.001	< .001	0.046	—			
TAC	0.48 *	0.52 **	0.45 *	0.45 *	—		
	0.010	0.006	0.015	0.016	—		
RPA	0.22	0.39 *	0.45 *	0.40 *	0.20	—	
	0.162	0.033	0.016	0.030	0.176	—	
WPA	0.08	0.00	0.04	0.14	0.17	0.45 *	—
	0.357	0.496	0.426	0.258	0.214	0.015	—

Key: VIC: victory/ GOL: goals/ SHO: shots/ ASS: assists/ TAC: tackles/ RPA: right passes/ WPA: wrong passes
Notice. H_a is positive correlation. Note. * $p < .05$, ** $p < .01$, *** $p < .001$, one-sided.

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Discussion

The main findings of this study reveal that the average number of goals scored by the team strongly influences the team's success in the match due to the strong correlation between the average number of goals scored by the team and the winning rates. Mendez et al. (2019) evaluated the performance in the Spanish, Portuguese, and Russian leagues and found that positional attack strategies that allow athletes to gain a numerical advantage influence the incidence of goals, which becomes a powerful determinant of the match's outcome. Moreover, a direct relationship exists between the number of assists with the goal average, and the total number of tackles and a Futsal team's average goals. Moreover, a high rate of missteps will culminate in fewer victories.

Hobus & Rotther (2021) analyzed the influence of goal rates for the classification of a team in LNF 2019; they found that the number of goals scored by a team was a determinant for a better classification. These data reinforce that a higher average of goals scored triggers a successful action when analyzing the victory rates for the teams.

An average correlation index is presented when observing the average shots concerning the victory rates, a fact that is consistent with the findings of Voser et al. (2017). When analyzing the average shots on goal with the result of the games, we can concur that the teams with higher average shots also had higher victory rates.

It is important to emphasize the importance of a collective dynamic that allows the athlete to achieve an efficient position to shoot at the goal, with the fundamentals and positioning for the kick as a technique being crucial and refined (Voser et al., 2017). This statement is corroborated by Álvarez-Kurogi (2020), who evaluated the Spanish Futsal team and identified that dominating and controlling the ball in the offensive phase will allow a better possibility of finishing and thus exercising a fundamental action in the team's offensive phase.

This idea is supported by the findings of Álvares Medina (2018), who found that quick actions of 1 to 2 passes between athletes favor most goals in the Spanish Futsal League.

In field soccer, Brites (2015) analyzed the relationship of fundamental passing with the rates of shots on goal of the German field soccer team participating in the FIFA World Cup. He showed an assistance utilization of 82%, allowing 14 shots on goal, 9 of which were correct per match, resulting in a performance of 6 wins in 7 games played.

Meanwhile, approximately 24.5% of goals are produced with a frequency of 4–5 correct passes, and approximately 80% of goal-scoring possibilities arise after 1–2 previous passes (Álvares Medina, 2018).

Although coming from another sport, data from Álvares Medina et al. (2018) and Brites (2015) have the goal as the main determining factor, thus confirming the findings of this study concerning the average correlation index ($r = 0.72$). Moreover, this study's findings present a positive correlation between the average assists with the victory rates in LNF 2021.

Nevertheless, in the same study by Brites (2015), when a team faced a high rate of tackling at the expense of another, a high possibility of success was noted in the match. These findings corroborate the data presented in this study, where the average tackling positively correlated with the winning rates. There is a natural lack of correlation between the rates of wrong passes and victories ($r = 0.08$), and hardly all teams with high error rates tend to have success in matches.

A possible limitation of this study is the lack of a clear delimitation to what is a right pass, unlike assists, which are computed when there is goal completion. It may explain the lack of relationship between this foundation and the winning rates since it shows a positive relationship but weak with average goals, shots, and assists.

Conclusion

The performance analysis is relatively recent in our modality, and few professionals are hired specifically to perform certain functions. However, such performance analysis could lead to greater growth in Futsal due to the importance it has received, in addition to the valorization that is evident from managers, technical committees, and athletes.

With the premise that the fundamental goal of a sports team in Futsal is to finish the game with a positive result (i.e., victory), this study shows that teams with a higher average of shots, average assists, and higher average of goals have a positive correlation with the rates of victories. The low correlation between teams with high averages of wrong passes and victories is also noteworthy, implying that teams with a higher incidence of error do not achieve positive results.

Based on the findings of this study, it is suggested that technical committees pay attention to the importance of putting greater emphasis on the fundamental pass because positional strategies impact numerical advantage. Furthermore, they must focus on quick and accurate actions in the dynamics of ball exchange and defense/attack transition as key variables that will influence a higher rate of victories.

Conflicts of interest

The authors declare no conflict of interest.

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