ANALYSIS OF DRIBBLING-DISTANCE COVERAGE PERFORMED BY FUTSAL ATHLETES INDONESIAN FUTSAL LEAGUE 2021

ANÁLISE NA DISTÂNCIA DA COBERTURA DO DRIBLE EFETUADO POR ATLETAS DE FUTSAL DA LIGA INDONÉSIA DE FUTSAL 2021

ANÁLISIS SOBRE LA DISTANCIA DE COBERTURA DEL REGATEO REALIZADO POR LOS ATLETAS DE FÚTBOL DE SALÓN DE LA LIGA INDONESIA DE FUTSAL 2021

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ABSTRACT

Introduction: Futsal players must master dribbling in attack and defense positions for a more significant competitive advantage. Optimizing technical control can positively influence decision-making. However, the literature lacks comparative analyses focused on the coverage distance of this technique in sports finals and semifinals. Objective: Analyze the coverage distance of dribbling by futsal players, comparing semifinals and finals results in the Indonesian Futsal League 2021. Methods: A cross-sectional research design method is used in this research. The samples consisted of four games (two semifinal games and two final games) played by four teams (40 players). Movie Maker software was used to cut videos on each dribbling movement, and Kinovea software analyzed dribbling distance. Dribbling-distance differences between the first and second halves of the games were calculated using Wilcoxon's test. Results: The results show no statistically significant difference in dribbling distances between the first and second halves of the semifinals and finals ($p = 0.402$ for the semifinals dan $p = 0.090$ for the finals). Regarding the team analysis, most of the dribbling distances covered in the first and second halves of the semifinals and finals by players from each team were not statistically different, except those covered by Team BTS players in the finals. In all, there were 712 dribbling occurrences in the semifinals and finals, covering 5621.98 meters. The average dribbling distance was 7.90 meters and SD 4.41. Conclusions: The dribbling-distance coverage in the semifinals and finals of the Indonesian Futsal League 2021 was an average of 7.90 meters; no statistically significant difference was found between the finals and semifinals results. ***Evidence Level II; Therapeutic Studies – Investigating the results.***

Keywords: Cross-Sectional Studies; Soccer; Athletic Performance.

RESUMO

Introdução: Para maior vantagem competitiva, os jogadores de futsal devem dominar os dribles nas posições de ataque e defesa. A otimização do domínio técnico pode influenciar positivamente a tomada de decisões. Porém, a literatura carece de análises comparativas focadas na distância de cobertura dessa técnica em finais e semifinais esportivas. Objetivo: Analisar a distância de cobertura do drible por jogadores de futsal comparando o resultado das semifinais e finais da Liga Indonésia de Futsal 2021. Métodos: A pesquisa utilizou método de desenho de pesquisa transversal. As amostras consistiam em quatro jogos (dois jogos semifinais e dois jogos finais) disputados por quatro equipes (40 jogadores). O software Movie Maker foi usado para cortar vídeos em cada movimento de drible, e o software Kinovea foi usado para analisar a distância de drible. As diferenças na distância de drible entre a primeira e a segunda metades dos jogos foram calculadas usando o teste de Wilcoxon. Resultados: Os resultados mostram que não foi encontrada diferença estatisticamente significativa nas distâncias de drible entre a primeira e a segunda metades das semifinais e finais ($p = 0,402$ para as semifinais dan $p = 0,090$ para as finais). Em relação à análise da equipe, a maioria das distâncias de drible cobertas na primeira e segunda metades das semifinais e finais pelos jogadores de cada equipe não foram estatisticamente diferentes, exceto aquelas cobertas pelos jogadores do Time BTS nas finais. Ao todo, foram 712 ocorrências de dribles nas semifinais e finais, cobrindo 5621,98 metros. A média de drible percorrido foi de 7,90 metros (±4,41). Conclusões: A média de distância da cobertura do drible nas semifinais e finais da Liga Indonésia de Futsal 2021 foi de 7,90 metros, não foi encontrada diferença estatisticamente significativa entre o resultado das finais e semi-finais. ***Nível de evidência II; Estudos Terapêuticos - Investigação de Resultados.***

Descritores: *Estudos Transversais; Futebol; Desempenho Atlético.*

RESUMEN

Introducción: Para obtener una mayor ventaja competitiva, los jugadores de fútbol de salón deben dominar el regateo en posiciones de ataque y defensa. La optimización del dominio técnico puede influir positivamente en la toma de decisiones. Sin embargo, la literatura carece de análisis comparativos centrados en la distancia de cobertura de esta técnica en las finales y semifinales deportivas. Objetivo: Analizar la distancia de cobertura del regateo por

los jugadores de fútbol de salón comparando el resultado de las semifinales y finales de la Liga Indonesia de Futsal 2021. Métodos: La investigación utilizó el método de diseño de investigación transversal. Las muestras consistieron en cuatro partidos (dos semifinales y dos finales) disputados por cuatro equipos (40 jugadores). Se utilizó el software Movie Maker para cortar los vídeos de cada movimiento de regateo y el software Kinovea para analizar la distancia de regateo. Las diferencias en la distancia de regateo entre la primera y la segunda parte de los partidos se calcularon mediante la prueba de Wilcoxon. Resultados: Los resultados muestran que no se encontraron diferencias estadísticamente significativas en las distancias de regateo entre el primer y el segundo tiempo de las semifinales y las finales (p = 0,402 para las semifinales dan p = 0,090 para las finales). En cuanto al análisis por equipos, la mayoría de las distancias de regateo cubiertas en el primer y segundo tiempo de las semifinales y las finales por los jugadores de cada equipo no fueron estadísticamente diferentes, excepto las cubiertas por los jugadores del equipo BTS en las finales. En total, se produjeron 712 regateos en las semifinales y en la final, cubriendo 5621,98 metros. La distancia media regateada fue de 7,90 metros (±4,41). Conclusiones: La distancia media de cobertura del regateo en las semifinales y en la final de la Liga de Futsal de Indonesia 2021 fue de 7,90 metros y no se encontraron diferencias estadísticamente significativas entre los resultados de las finales y de las semifinales. ***Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.***

Descriptores: *Estudios transversales; Fútbol; Rendimiento Atlético.*

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INTRODUCTION

Futsal is known as an indoor association football game with the goal of putting the ball into the opponent's goalpost. Pina, et al. (2021)[1] stated that futsal is a variant of association football with different execution. Futsal players should have advanced physical capabilities, such as ability to do repeated sprints and power of leg muscles, together with ball skills in passing, dribbling, and shooting, as well as well-developed coordination.[2] Futsal is played between two teams with each team having five players in a small field. Each player has the possibility of playing the ball a few times. Passings are played faster in attack and defense. Movements in this game are aimed at creating open spaces. One-on-one plays are possible. Implementation of faster tactical action and changeable tactics of play where all players can be utilized for attacks and defenses are also present. Therefore, this raises the basic characteristics of futsal players who run often, change positions quickly, show intelligence in the game due to quick decision making, and dribble in tight spaces (Ocak & Sert, 2020). [3] Based on this explanation, dribbling is one of the basic characteristics of futsal players. Supporting this statement, Corrêa, et al (2016)[4] also stated that dribbling is one of the characteristics of futsal related to the player's ability. In accordance with this, Ganesh et al (2019) stated that a player who controls the ball by moving in a certain direction to avoid defenders taking the ball is called dribbling.[5]

Successful dribbling means the player beats defenders while still maintaining possession of the ball to gain space. As stated by Yiannaki et al (2020)[6] that in the pattern of attacking the opponent, each player needs to try to keep the ball in his possession before it is passed to a friend. In order to improve the process of training and coaching futsal sports, various activities in futsal matches have been observed in recent years such as standing, walking, jogging, and running activities in matches. The movements of futsal players are classified into standing, walking, jogging, as well as medium, high, and maximal speed running. Alvarez, et al[7] showed that in futsal games, 28.5% of players did medium running, 13.7% of players did high running, and 8.9% of players did maximal speed running. Meanwhile, the range of basic techniques used in matches is a topic found to be rarely studied. Research in this context is very important for future sports preparation because it contributes to optimization of technical mastery in training. In line with this statement, Agras et al[8] argue that basic technical analysis in matches has played a role in improving sports performance and helping coaches to make decisions, this is because match analysis provides knowledge about the situation that occurs in the match.

Through the analysis of the dribbling distance covered by futsal players in a match, the results of the analysis can be used as the basis for dribbling mastery exercises and the basis for compiling dribbling test instruments according to the distance traveled by players in the match. In line with this, Zeljko et al (2020) state that exercises and tests need to be carried out at a distance that imitates the special performance of futsal, so that it will help improve understanding and mastery of correct dribbling techniques.[9]

METHODOLOGY

Method

The cross sectional survey design was used to observe the dribbling distance during the semifinal and final matches and then measure how far the dribbling distance was carried out by the players. It studies dynamics with an approach, observation, or data collection in a certain time which is momentary in nature and is carried out simultaneously at the same time.[10]

Subjects

This research sampled two semifinal and two final games of Indonesia Futsal League 2021. These games were played by four futsal teams:
1. Black Steel FC Manokwari, West Papua, Indonesia (Black Steel)
2. Bintang Timur FC Surabaya (BTS)
3. SKN FC Kebumen (SKN)
4. Vamos FC Mataram (Vamos)

The semifinals consisted of Black Steel vs BTS and SKN vs Vamos, while the finals consisted of Black Steel vs SKN and BTS vs Vamos. The players analyzed acted as defenders, wingers, and pivots in the game. In total, there were 40 sample players.

Procedures

Videos of the semifinal and final matches of Indonesia Futsal League 2021 were inputted to the computer, then the dribbling movements of each player were analyzed. In analyzing the movements, the videos were cut by using Movie Maker software, then the cut video segments were analyzed for their distance showing with Kinovea software. The dribbling distance covered was calculated as a cumulative amount from the continuous frame shifts. The results of dribbling distance analysis were presented in meters. To more accurately characterize the dribbling movements during the semifinal and final matches of the 2021 Indonesian Futsal League, the researcher analyzed every dribbling movement made by players during the game period in round 1 and round 2.

Data analysis

The research measured total distance, mean, and SD. Before each was analyzed, Kolmogorov-Smirnov test shows that the data is not normally distributed. Since the data were not distributed normally, non-parametric Wilcoxon test was used to compare dribbling distances of each halftime. The significance level used is $p < 0.05$. All statistical analysis procedure was conducted with SPSS 16.

RESULTS AND DISCUSSION

Results

Table 1 shows the description of futsal dribbling data in the semifinals and finals of Indonesia Futsal League 2021. It shows that in the four matches, players dribbled for 712 times, covering 5621.98 meters of total distance, with the average distance covered was 7.90 meters, and SD 4.41.

Table 2 shows the comparison of the average dribbling distances in both halves of the semifinals and finals. Based on the p-values, there was no statistically-significant difference in the dribbling distances covered in both halves of the semifinals and finals. In the semi-finals, the mean dribbling distance traveled by players in the 1st round was 8,526 m while for the 2nd round it was 8,399 m. In the final match, the mean dribbling distance traveled by players in the 1st round is 7,216 m while for the 2nd round it is 7,879 m.

Table 3 shows the comparison of dribbling distances of each team in both halves of the semifinals and finals of Indonesia Futsal League. Based on the p-values, there was a statistically-significant difference in the dribbling distances covered by Team BTS players in both halves of their final match, while the opposite was found in their dribbling distances in both halves of their semifinal match. The p-values also show that no statistically-significant difference was found in dribbling distances covered by Teams Black Steel, SKN, and Vamos in both halves of the semifinals and finals.

In the semi-finals, the Black Steel team in the 1st round covered a mean dribbling distance of 8,147 meters while the 2nd round covered a mean dribbling distance of 8,160 meters, the SKN team in the 1st round covered a mean dribbling distance of 9,031 meters while the 2nd round covered a mean dribbling distance of 8,041 meters, the BTS team in the 1st round the mean dribbling distance was 8,519 meters while the 2nd round covered a mean dribbling distance of 9,950 meters, the Vamos team in the 1st round covered a mean dribbling distance of 8,623 meters while in the 2nd round the mean dribbling distance was 7,844 meters.

Table 1. Description of futsal dribbling distance data.

Matches	N	Total	Mean	SD
Semifinals and finals	712	5621.98	7.90	4.41

Table 2. Comparison of dribbling in the semifinals and finals.

Matches	First Half	Second Half	p-value
Semifinals	8.526 ± 4.547	8.399 ± 4.750	.402
Finals	7.216 ± 3.537	7.879 ± 4.883	.090

Table 3. Perbandingan Jarak Dribbling Pada Tim.

Matches	Teams	First Half	Second Half	p-value
Semifinals	Black Steel	8.147 ± 4.202	8.160 ± 4.087	.930
	BTS	8.519 ± 3.619	9.950 ± 6.424	.808
	SKN	9.031 ± 4.191	8.041 ± 4.689	.189
	Vamos	8.623 ± 5.610	7.844 ± 3.977	.831
Finals	Black Steel	7.422 ± 4.313	5.509 ± 2.420	.217
	SKN	6.690 ± 3.209	6.047 ± 3.499	.390
	BTS	6.436 ± 2.089	9.484 ± 4.983	.001*
	Vamos	9.721 ± 4.383	11.453 ± 5.764	.169

* Significant difference in dribbling distance covered in both halves ($p < 0.05$)

In the final match, the Black Steel team in the 1st round covered a mean dribbling distance of 7,422 meters while the 2nd round covered a mean dribbling distance of 5,509 meters, the SKN team in the 1st round covered a mean dribbling distance of 6,690 meters while the 2nd round covered a mean dribbling distance of 6,047 meters, the BTS team in 1st round covered a mean dribbling distance of 6,436 meters while the 2nd round covered a mean dribbling distance of 9,484 meters, the Vamos team in the 1st round covered a mean dribbling distance of 9,721 meters while the 2nd round covered a mean dribbling distance of 11,453 meters.

Figure 1 shows the histogram of each team's dribbling distance during the first halves of the semifinals based on dribbling chronological sequence. The farthest dribbling distance of Team Black Steel was found in 0:04:27, amounting to 19.45 meters, that of Team BTS was found in 0:10:29, amounting to 15.75 meters, that of Team SKN was found in 0:09:48, amounting to 20.12 meters, and that of Team Vamos was found in 0:25:05 amounting to 22.31 meters.

Figure 2 shows the histogram of each team's dribbling distance during the second halves of the finals based on dribbling chronological sequence. The farthest dribbling distance of Team Black Steel was found in 0:08:19, amounting to 18.35 meters, that of Team BTS was found in 0:47:27, amounting to 23.77 meters, that of Team SKN was found in 0:10:49, amounting to 22.20 meters, and that of Team Vamos was found in 0:16:38 amounting to 18.98 meters.

Table 4 shows the percentage of dribbling distance traveled by players in the semi-final match. The percentage of dribbling distance in the 1st round is 56.723% while the percentage of dribbling distance in the 2nd round is 43.277%.

Figure 3 shows the histogram of each team's dribbling distance during the first halves of the finals based on dribbling chronological sequence. The farthest dribbling distance of Team Black Steel was found in 0:00:06, amounting to 22.51 meters, that of Team SKN was found in 0:16:42, amounting to 14.67 meters, that of Team BTS was found in 0:26:21, amounting to 10.60 meters, and that of Team Vamos was found in 0:33:32 amounting to 20.47 meters.

Figure 4 shows the histogram of each team's dribbling distance during the second halves of the finals based on dribbling chronological sequence. The farthest dribbling distance of Team Black Steel was found in 0:07:29, amounting to 14.49 meters, that of Team SKN was found in 0:17:48, amounting to 20.53 meters, that of Team BTS was found in 0:10:32, amounting to 21.20 meters, and that of Team Vamos was found in 0:22:27 amounting to 23.71 meters.

Table 5 shows the percentage of dribbling distance covered in the finals. The first half amounted to 51.139% of total distance covered while the second half amounted to 48.861%.

DISCUSSION

Futsal is an indoor sport with high competition and intensity [11]. It is a dynamic sport, in which its athletes are required to always move. The movements in a futsal game include standing, walking, jogging, and running. The dynamism of the sport also includes individual ball skills useful for making it difficult for opponents to read the ball's direction. In order to successfully achieve the goal, mastery of dribbling techniques is needed. Dribbling is defined as a running movement using legs which aims to push the ball to keep it rolling on the field. Several researches have analyzed the distances of physical activities covered by the players during a game, such as walking, jogging, running, and sprinting distances. Interquartile Range shows that the total distance covered by players for the entire match is 3,133 meters of which 2,133 meters in the in-play phase and 1,028 meters in the out-of-play phase.[12] Another study[13] states for all matches the total distance covered

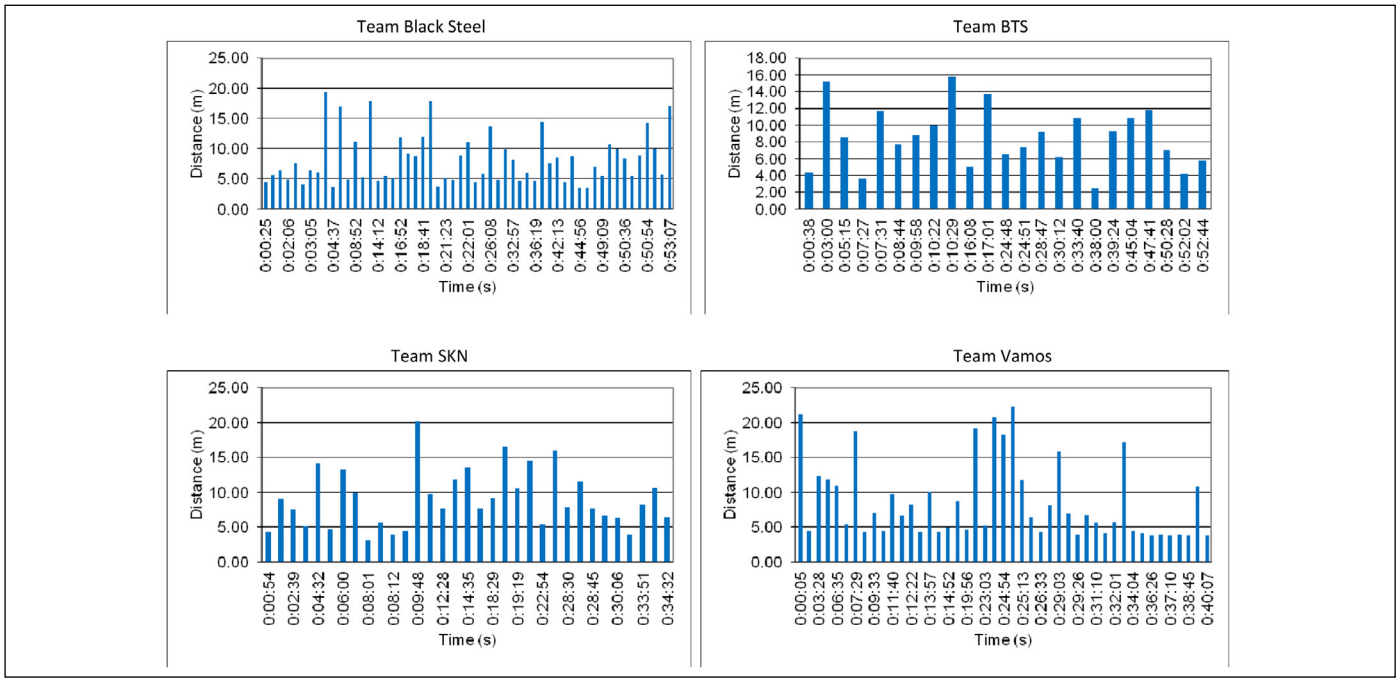

Figure 1. Histogram of each team's dribbling distance during the first halves of the semifinals based on dribbling chronological sequence.

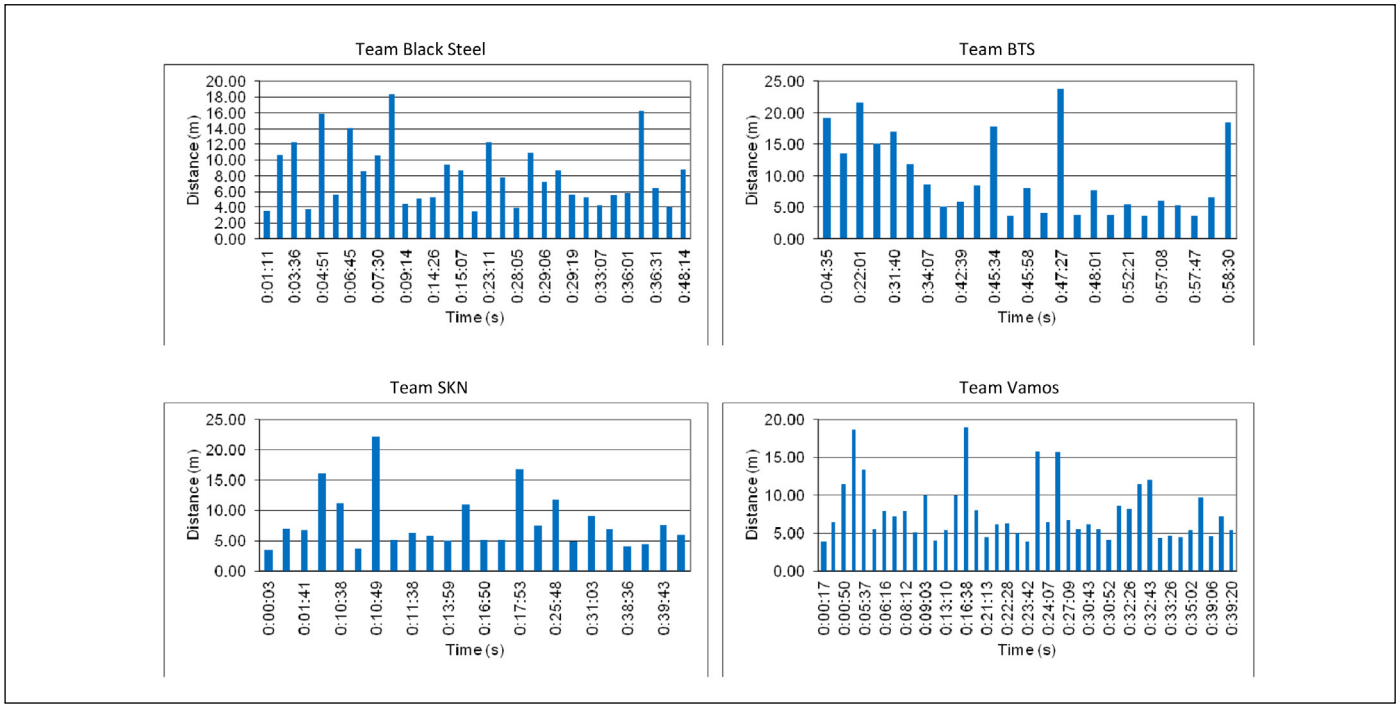

Figure 2. Histogram of each team's dribbling distance during the second halves of the semifinals based on dribbling chronological sequence.

Table 4. Percentage of dribbling distance in the semi-finals.

Semifinals	Total dribbling distance	Dribbling distances in each half	Percentage of each half's dribbling distance
First Half	2348.390	1332.080	56.723 %
Second Half		1016.310	43.277 %

was ± 71 m/min, with the activities carried out were walking per minute of 108.3 ± 51.5 m/min; jogging per minute of 76.5 ± 24.3 m/min; running per minute of 30.0 ± 19.2 m/min; and sprinting per minute of 8.5 ± 7.9 m/min. In addition, in the study of Milioni et al. stated that the total distance in the first half was 1,986 m and the second half was 1,856 m and the distance covered in minutes in the first half was 103.2 m/min and the second half was 96.4 m/min.[12] However, there is no research analyzing dribbling distance covered during futsal match.

This research analyzed dribbling distance covered in the semifinals and finals of Indonesia Futsal League 2021. Results show that there is no statistically-significant difference on the dribbling distances covered on both halves of both semifinals and finals (56.723 % and 43.277 % in both halves of the semifinals respectively and 51.139 % and 48.861 % in both halves of both finals respectively). In line with Bueno, et al. physical performance was decreasing in the second half of the matches, but statistically insignificant. Futsal basic techniques were found to always be used by players for attacking and defending in all matches. Passing, dribbling, and shooting become the principles of futsal player performance.[14] This is seen in the research by[15] that the percentage of successful dribbling star and non star players were 39.06% and 37.67% respectively while the percentage of successful shooting star and non star players were 44.61% and 33.91% respectively and the percentage of successful passing star and non star players were

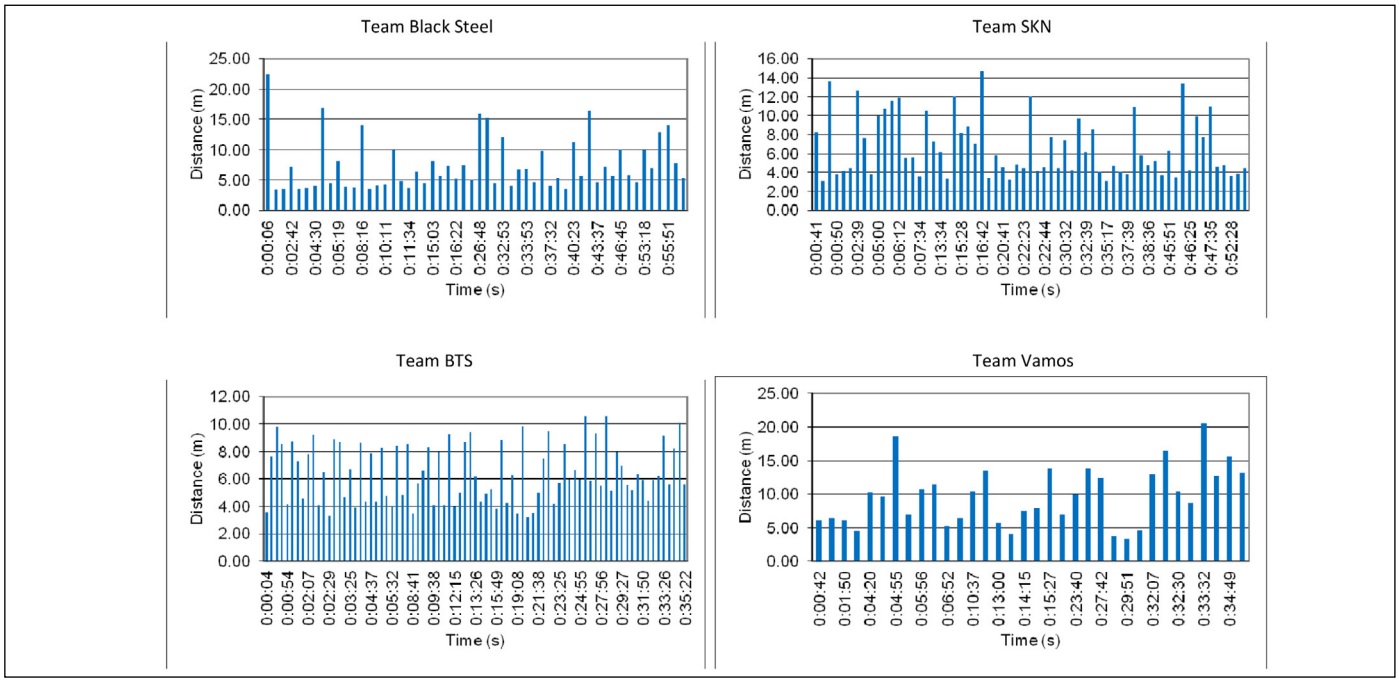

Figure 3. Histogram of each team's dribbling distance during the first halves of the finals based on dribbling chronological sequence.

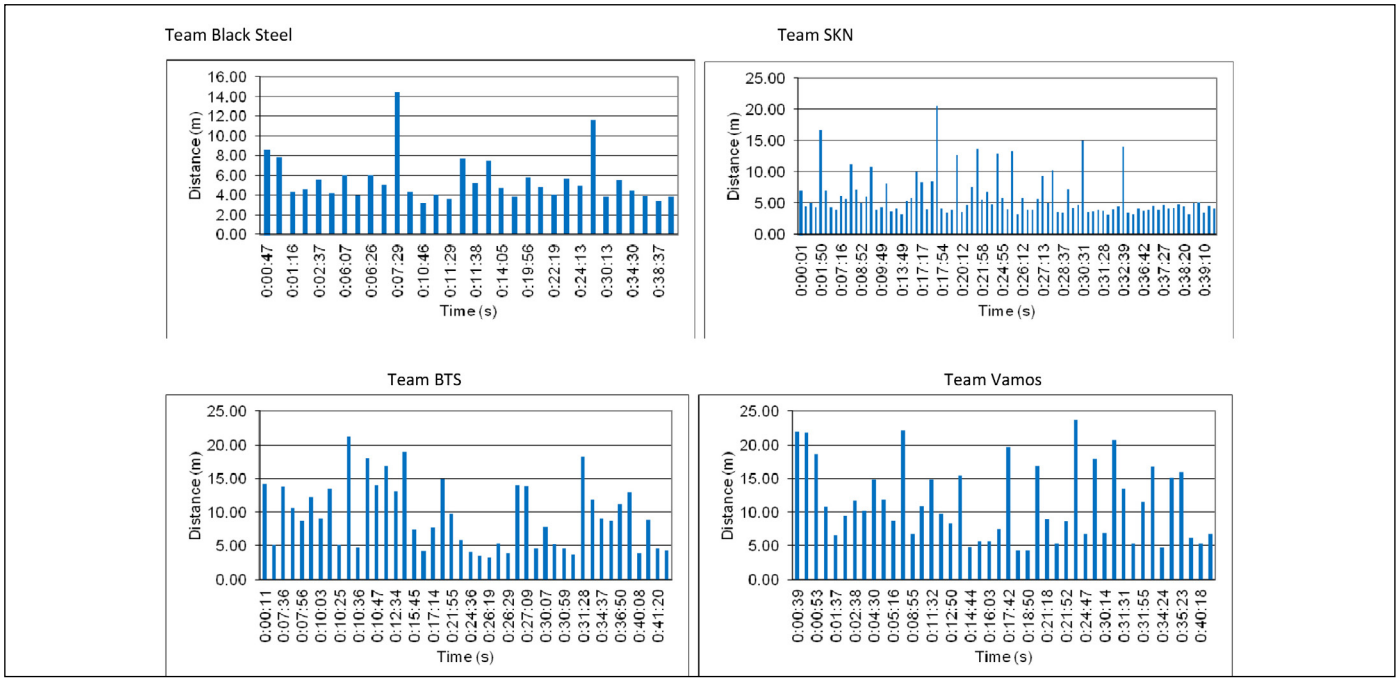

Figure 4. Histogram of each team's dribbling distance during the second halves of the finals based on dribbling chronological sequence.

Table 5. Percentage of dribbling distance in the finals.

Finals	Total dribbling distance	Dribbling distances in each half	Percentage of each half's dribbling distance
First Half	3273.590	1674.090	51.139 %
Second Half		1599.500	48.861 %

88.47% and 86.25% respectively. This proves the need of mastering futsal basic techniques, in which dribbling is one of them. Dribbling is one of the characteristics of futsal related to player ability.[16] Dribbling basic techniques are used in the match to pass over the opponents, spin and change the ball's direction, looking for right passing opportunities, hold the ball in control, and save the ball. The mastery of right dribbling techniques will help a futsal player to be able to work together smoothly when shooting for a goal. According to Gioldasis, teams with high successful dribbling rate will have the potential to create bigger opportunities in scoring a goal.[17]

CONCLUSIONS

Research shows that the average dribbling distance covered by players on the semifinals and finals of Indonesia Futsal League 2021 was 7.90 meters. In the first and second halves of the semifinals, the average dribbling distances covered by Team Black Steel were 8.147 and 8.041 meters respectively, Team SKN covered 9.031 and 8.041 meters, Team BTS covered 8.519 and 9.950 meters, Team Vamos coveed 8.623 and 7.844 meters respectively. In the first and second halves of the finals, the average dribbling distances covered by Team Black Steel were 7.422 and 5.509 meters, Team SKN covered 6.690 and 6.047 meters, Team BTS covered 6.436 and 9.484 meters and Team Vamos were 9.721 and 11.453 meters respectively.

All authors declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: Each author made a significant contribution to the manuscript. RID: concept. GE: critical review. SHA: manuscript draft.

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