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Araştırma Makalesi

2011, 2015, 2019 VE 2023 FIFA KADINLAR DÜNYA KUPASINA KATILAN ÜLKE TAKIMLARININ KOŞU MESAFELERİ VE TAHMİNİ OKSİJEN TÜKETİM KAPASİTELERİNİN ANALİZİ

ANALYSIS OF THE RUNNING DISTANCES AND ESTIMATED OXYGEN CONSUMPTION CAPACITIES OF THE COUNTRY TEAMS PARTICIPATING IN THE 2011, 2015, 2019 AND 2023 FIFA WOMEN'S WORLD CUP

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2011, 2015, 2019 ve 2023 FIFA Kadınlar Dünya Kupasına Katılan Ülke Takımlarının Koşu Mesafeleri ve Tahmini Oksijen Tüketim Kapasitelerinin Analizi

ÖZ

Bu çalışmanın amacı; 2011, 2015, 2019 ve 2023 FIFA Kadınlar Dünya Kupası'na katılan ülkelerin takımlarının koşu mesafeleri ve bu mesafelere göre tahmini oksijen tüketim kapasitelerini analiz etmektir. 2011 (16 ülke), 2015 (24 ülke), 2019 (24 ülke) ve 2023 yıllarında (32 ülke) FIFA (Federation Internationale de Football Association / Uluslararası Futbol Federasyonları Birliği) FIFA Kadınlar Dünya Şampiyonasına katılan toplam 96 ülkeden oluşmaktadır. Takımlara ait tahmini VO_2max'ın belirlenmesinde ise Marangoz tarafından geliştirilen VO_2max tahmini kestirim formülü kullanılmıştır. 2011, 2015, 2019 ve 2023 yıllarında yapılan FIFA Kadınlar Dünya Şampiyonasında en çok koşu mesafesine sahip olan ülkelerden dereceye (ilk dört) giren takımların çok az olduğu görülmektedir. Takımların toplam koşu mesafeleri takımların başarısını belirlemede veya takımların oynadıkları maçların sonucunu değiştirmede önemli olduğu ancak başarı için tek unsur olmadığı, başarıya ulaşmak için sadece maç koşusu performansı değil her maçın kendine özgü teknik, taktik ve sistemsel yaklaşımların olduğu ve diğer teknik-taktik gibi becerilerinde etkili olduğu düşünülmektedir. Sonuç olarak, toplam kat edilen mesafenin dolayısıyla maksimum oksijen tüketiminin yüksek olması müsabakaları kazanmak için tek başına yeterli bir ölçüt olmadığı ve maçın sonucunu doğrudan etkilemediği görülmektedir.

Anahtar Kelimeler: Kadınlar, futbol, dünya şampiyonası, koşu mesafesi, VO_2max

Analysis of the Running Distances and Estimated Oxygen Consumption Capacities of the Country Teams Participating in The 2011, 2015, 2019 and 2023 FIFA Women's World Cup

ABSTRACT

The purpose of this study is to analyze the running distances of the teams participating in the 2011, 2015, 2019, and 2023 FIFA Women's World Cups, as well as their estimated oxygen consumption capacities based on these distances. The total of 96 countries participating in the FIFA Women's World Championships in the years 2011 (16 countries), 2015 (24 countries), 2019 (24 countries), and 2023 (32 countries) is comprised. The VO_2max estimation formula developed by Marangoz was used to determine the estimated VO_2max of the teams. Across the 2011, 2015, 2019, and 2023 FIFA Women's World Championships, it is observed that only a few of the top-ranked teams possess the highest running distances. While the cumulative running distances of teams play a role in determining their success and potentially influencing match outcomes, it is acknowledged that they are not the sole determinant of success. Success in this context is contingent not only on the performance during match runs but also on the unique technical, tactical, and systemic approaches employed in each game. Other skills, such as technical-tactical abilities, are also believed to significantly contribute to achieving success. Consequently, it is evident that the total distance covered and consequently, the high levels of maximal oxygen consumption, do not singularly constitute a sufficient criterion for winning matches and do not directly dictate match outcomes.

Keywords: Women, football, world championship, running distance, VO_2max

INTRODUCTION

Historical development and natural conditions (field conditions, country-specific characteristics, especially cultural values, and players' physical attributes) lead to the emergence of diverse styles of play in different regions and countries around the world[1]. For instance, English football emphasizes endurance until the last minutes of the 90-minute match, physical confrontation, long passes, and a high tempo. Brazilian football seems to have reached the pinnacle of elegance on the field. On the other hand, German and Dutch football require more detailed technical game plans and involve covering longer distances[2]. The energy expended during a football match necessitates players to possess certain physiological capacities directly related to their physical condition and training methods. Football requires distinct approaches based on playing style, field position, and the match's level of difficulty[3]. All players need to be fast and active, both to possess the ball during the game and to support their teammates in defense and attack. Generally, they are expected to cover ground for 90 minutes and be in a suitable position to support a teammate in possession of the ball[2]. Match analyses, widely employed across many sports, assist coaches in collecting objective information that can offer performance feedback[4]. Despite football being traditionally seen as a male sport, the development of women's football has now reached a level few could have imagined [5,6]. In recent years, global and continental championships for women's football have been organized, such as the FIFA Women's World Cup and the European Championships[7]. The FIFA Women's World Cup is a professional football tournament organized by FIFA, involving elite national women's football teams[8]. It is held every four years, one year after the men's[9]. The increasing popularity of women's football worldwide has led to a surge in scientific research articles investigating the sport's characteristics and requirements[10,11]. The outcomes of future scientific studies on women's football can accelerate the speed and quality of its development [12]. In this context, the aim of this study is to analyze the running distances of teams from countries participating in the 2011, 2015, 2019, and 2023 FIFA Women's World Cups and their estimated oxygen consumption capacities based on these distances.

MATERIAL AND METHODS

Population and Sample of the Research

The research encompasses a total of 96 countries that participated in the FIFA (Federation Internationale de Football Association / International Federation of Association Football) Women's World Cup in the years 2011 (16 countries), 2015 (24 countries), 2019 (24 countries), and 2023 (32 countries).

Data Collection

The statistical data of the matches (average running distances) were obtained from FIFA's official website, https://www.fifa.com, and the https://en.wikipedia.org website. For the estimation of the teams' predicted VO_2max, the modified estimation formula "VO_2max= M-0.9414/0.0834" based on a 90-minute / +90-minute run, originally derived from Cooper's (1968)[13] formula using a 12-minute run, was utilized, where "M" denotes the running distance (1 mile = 1.609m). The numerical value of the Excel formula employed by Cooper's (1968)[13] and modified by Marangoz (2018)[2] remained consistent at (-11.28772636). The teams' estimated VO_2max values based on running distances were calculated using the "VO_2max Calculation Programs" developed by Marangoz (2019)[14] within Excel.

VO_2max Test (ml/kg/dk)

Aerobic capacity denotes the general scope of metabolic processes occurring in the human body and represents a substantial portion of the total energy capacity. Maximum oxygen uptake (VO_2max) signifies the intensity of aerobic processes, and maximal oxygen consumption (VO_2max) denotes the maximum quantity of oxygen consumed per kilogram of body weight per minute[15]. VO_2max is the most reliable test employed for determining the maximal aerobic capacity, a criterion for cardiorespiratory development [14]. The higher the amount of oxygen an individual can utilize within a unit of time, the greater their aerobic capacity, which significantly influences performance in endurance sports[16].

Ethical Considerations

Necessary permissions for this research were obtained from the Dean's Office of the Faculty of Sport Sciences at Ahi Evran University, Kırşehir (Reference No: E-51788177-000-00000543932, Date: 07.08.2023), as well as the Social and Human Sciences Scientific Research and Publication Ethics Board (Date: 07.09.2023 and Decision No: 2023/08/01).

Research Model

This study employs a descriptive research model, which aims to portray an existing or past condition in its current form. Descriptive research approaches involve presenting the current state as is within a specific time frame[17].

Statistical Analysis

The data obtained from this research were analyzed using SPSS 26.0 software. The running distances and estimated VO_2max values of the teams were sorted in descending order using SPSS statistical program's "sort descending" feature, arranging the values from the highest to the lowest.

RESULTS

Table 1. 2011 FIFA Women's World Championship Ranking of Countries by Rank and Running Distance[18,19]

	Countries by Rank				Countries by Running Distance		
	Countries	**Final Result**	**m**	**VO_2max**	**Countries**	**m**	**VO_2max**
1.	Japan	Champions	10470	66,74	United States	10990	70,61
2.	United States	Runners-Up	10990	70,61	England	10805	69,23
3.	Sweden	Third Place	10220	64,87	New Zealand	10760	68,9
4.	France	Fourth Place	10480	66,81	Canada	10580	67,56
5.	England	Quarter-Finals	10805	69,23	Norway	10570	67,48
6.	Germany	Quarter-Finals	10375	66,03	France	10480	66,81
7.	Australia	Quarter-Finals	9840	62,04	Japan	10470	66,74
8.	Brazil	Quarter-Finals	9350	58,39	Germany	10375	66,03
9.	New Zealand	Group Stage	10760	68,9	North Korea	10360	65,92
10.	Canada	Group Stage	10580	67,56	Sweden	10220	64,87
11.	Norway	Group Stage	10570	67,48	Mexico	10050	63,61
12.	North Korea	Group Stage	10360	65,92	Colombia	10020	63,38
13.	Mexico	Group Stage	10050	63,61	Australia	9840	62,04
14.	Colombia	Group Stage	10020	63,38	Equatorial Guinea	9500	59,51
15.	Nigeria	Group Stage	9240	57,57	Brazil	9350	58,39
16.	Equatorial Guinea	Group Stage	9500	59,51	Nigeria	9240	57,57

Table 2. 2015 FIFA Women's World Championship Ranking of Countries by Rank and Running Distance[20,21]

	Countries by Rank				Countries by Running Distance		
	Countries	**Final Result**	**m**	**VO_2max**	**Countries**	m	**VO_2max**
1.	United States	Champions	11030	70,91	Costa Rica	11299	72,91
2.	Japan	Runners-Up	11050	71,06	Germany	11272	72,71
3.	England	Third Place	10886	69,84	Sweden	11268	72,68
4.	Germany	Fourth Place	11272	72,71	Canada	11141	71,74
5.	France	Quarter-Finals	11046	71,03	Japan	11050	71,06
6.	Canada	Quarter-Finals	11141	71,74	France	11046	71,03
7.	Australia	Quarter-Finals	10778	69,03	United States	11030	70,91
8.	China	Quarter-Finals	10546	67,30	Mexico	11022	70,85
9.	Brazil	Round of 16	10917	70,07	Norway	11008	70,74
10.	Norway	Round of 16	11008	70,74	Brazil	10917	70,07
11.	Cameroon	Round of 16	10393	66,16	South Korea	10909	70,01
12.	Columbia	Round of 16	10486	66,85	England	10886	69,84
13.	Netherlands	Round of 16	10825	69,38	Switzerland	10879	69,78
14.	South Korea	Round of 16	10909	70,01	Netherlands	10825	69,38
15.	Switzerland	Round of 16	10879	69,78	Spain	10812	69,28
16.	Sweden	Round of 16	11268	72,68	Australia	10778	69,03
17.	Thailand	Group Stage	10575	67,52	New Zealand	10724	68,63
18.	Costa Rica	Group Stage	11299	72,91	Thailand	10575	67,52
19.	New Zealand	Group Stage	10724	68,63	China	10546	67,30
20.	Spain	Group Stage	10812	69,28	Columbia	10486	66,85
21.	Nigeria	Group Stage	9943	62,81	Cameroon	10393	66,16
22.	Mexico	Group Stage	11022	70,85	Ivory Coast	10076	63,80
23.	Ivory Coast	Group Stage	10076	63,80	Ecuador	9958	62,92
24.	Ecuador	Group Stage	9958	62,92	Nigeria	9943	62,81

Table 3. 2019 FIFA Women's World Championship Ranking of Countries by Rank and Running Distance[22,23]

	Countries by Rank				Countries by Running Distance		
	Countries	**Final Result**	**m**	**VO_2max**	**Countries**	**m**	**VO_2max**
1.	United States	Champions	8671	53,33	Australia	10420	66,36
2.	Netherlands	Runners-Up	7890	47,51	Nigeria	10162	64,44
3.	Sweden	Third Place	8337	50,84	Germany	9902	62,50
4.	England	Fourth Place	9015	55,89	Brazil	9574	60,06
5.	Germany	Quarter-Finals	9902	62,50	China	9415	58,87
6.	France	Quarter-Finals	8141	49,38	Canada	9270	57,79
7.	Italy	Quarter-Finals	8445	51,65	Norway	9134	56,78
8.	Norway	Quarter-Finals	9134	56,78	England	9015	55,89
9.	Australia	Round of 16	10420	66,36	United States	8671	53,33
10.	Brazil	Round of 16	9574	60,06	Jamaica	8631	53,03
11.	Canada	Round of 16	9270	57,79	Italy	8445	51,65
12.	Spain	Round of 16	8188	49,73	Sweden	8337	50,84
13.	Japan	Round of 16	7873	47,38	Spain	8188	49,73
14.	China	Round of 16	9415	58,87	France	8141	49,38
15.	Cameroon	Round of 16	8064	48,81	Cameroon	8064	48,81
16.	Nigeria	Round of 16	10162	64,44	Chile	7908	47,64
17.	Chile	Group Stage	7908	47,64	Netherlands	7890	47,51
18.	Argentina	Group Stage	7398	43,84	Japan	7873	47,38
19.	Scotland	Group Stage	6915	40,24	New Zealand	7781	46,70
20.	New Zealand	Group Stage	7781	46,70	South Africa	7718	46,23
21.	South Korea	Group Stage	7583	45,22	South Korea	7583	45,22
22.	South Africa	Group Stage	7718	46,23	Thailand	7488	44,51
23.	Jamaica	Group Stage	8631	53,03	Argentina	7398	43,84
24.	Thailand	Group Stage	7488	44,51	Scotland	6915	40,24

Table 4. 2023 FIFA Women's World Championship Ranking of Countries by Rank and Running Distance[24,25]

	Countries by Rank				Countries by Running Distance		
	Countries	Final Result	m	VO_2max	Countries	m	VO_2max
1.	Spain	Champions	7359,46	43,56	Australia	8065,27	48,82
2.	England	Runners-Up	7858,58	47,28	France	7913,52	47,68
3.	Sweden	Third Place	7490,54	44,53	England	7858,58	47,28
4.	Australia	Fourth Place	8065,27	48,82	Japan	7802,50	46,86
5.	Japan	Quarter-Finals	7802,50	46,86	Morocco	7680,46	45,95
6.	France	Quarter-Finals	7913,52	47,68	Zambia	7666,51	45,84
7.	Netherlands	Quarter-Finals	7307,61	43,17	Costa Rica	7619,05	45,49
8.	Colombia	Quarter-Finals	7233,68	42,62	Philippines	7613,09	45,45
9.	USA	Round of 16	7565,27	45,09	New Zealand	7600,00	45,35
10.	Nigeria	Round of 16	7247,46	42,72	Republic of Ireland	7593,15	45,30
11.	Denmark	Round of 16	7519,12	44,75	Germany	7587,79	45,26
12.	Morocco	Round of 16	7680,46	45,95	USA	7565,27	45,09
13.	Jamaica	Round of 16	7039,66	41,17	Denmark	7519,12	44,75
14.	Switzerland	Round of 16	7430,22	44,08	Sweden	7490,54	44,53
15.	Norway	Round of 16	7432,20	44,10	Norway	7432,20	44,10
16.	South Africa	Round of 16	7022,88	41,05	Switzerland	7430,22	44,08
17.	Germany	Group Stage	7587,79	45,26	Spain	7359,46	43,56
18.	Brazil	Group Stage	7057,78	41,31	Haiti	7319,11	43,25
19.	Portugal	Group Stage	6492,91	37,10	Netherlands	7307,61	43,17
20.	New Zealand	Group Stage	7600,00	45,35	Nigeria	7247,46	42,72
21.	Canada	Group Stage	6652,45	38,29	Colombia	7233,68	42,62
22.	Italy	Group Stage	7084,82	41,51	Chinese	7174,30	42,18
23.	Chinese	Group Stage	7174,30	42,18	Italy	7084,82	41,51
24.	Philippines	Group Stage	7613,09	45,45	Argentina	7076,49	41,45
25.	Zambia	Group Stage	7666,51	45,84	Brazil	7057,78	41,31
26.	Republic of Ireland	Group Stage	7593,15	45,30	Jamaica	7039,66	41,17
27.	Argentina	Group Stage	7076,49	41,45	South Africa	7022,88	41,05
28.	South Korea	Group Stage	6983,79	40,76	South Korea	6983,79	40,76
29.	Haiti	Group Stage	7319,11	43,25	Canada	6652,45	38,29
30.	Costa Rica	Group Stage	7619,05	45,49	Panama	6544,26	37,48
31.	Panama	Group Stage	6544,26	37,48	Portugal	6492,91	37,10
32.	Vietnam	Group Stage	6325,97	35,85	Vietnam	6325,97	35,85

Note: Calculated from the distance run (90 mins) in the match going to overtime (120 mins).

DISCUSSION

The physical capacity of athletes is a significant determinant of sporting achievements. It encompasses numerous capacities, with aerobic capacity being a central component. The physiological basis of an organism's physical capacity involves enhancing the level of metabolic processes in line with the demands of physical effort endured by the organism, representing its functional capacity. In this context, metabolic processes refer to the conversion of chemical energy into mechanical energy[26]. Investigating maximum oxygen uptake provides essential data for players' health, planning and monitoring training effects, and is also valuable for early player selection. Therefore, an increase in VO_2max values serves as an indispensable indicator of improving athletes' physical abilities to achieve optimal sporting outcomes[15].

When reviewing the literature on the average VO_2max of elite female athletes, ranges such as 69.4-82.6 ml/kg/min[27], 70.83 ml/kg/min[28], and ≥77 ml/kg/min[29,30] have been identified. In a study that examined the VO_2max levels of 199 Elite Female Football Players who played for National teams between 1989 and 2007, an average of 62.2 kg elite female athletes between 1989-1994 resulted in VO_2max of 3.57 L (which equates to (3.571000/62.2 kg =57.4 ml/kg/min), for the average of 62.1 kg elite female athletes between 1995-2001, the VO_2max was 3.51 L (which equates to (3.511000/62.1 kg =56.5 ml/kg/min), and for the average of 65 kg elite female athletes between 2002-2007, the VO_2max was 3.58 L (which equates to (3.58*1000/65 kg

=55.07 ml/kg/min)[31]. In other studies involving elite female athletes, Ingjer (1991)[32] reported VO_2max of 70.7 ml/kg/min for elite female cross-country skiers, Tonnessen et al. (2015)[33] measured VO_2max of 72 ml/kg/min for female athletes achieving Olympic rankings, and Tonnessen et al. (2014)[34] found a VO_2max of 73 ml/kg/min for female athletes who became Olympic and World champions. These findings align with the results obtained using the predictive estimation formula based on average 90-minute running distance as proposed by Marangoz (2018)[2]. Maximum oxygen consumption (VO_2max) serves as a crucial physiological determinant of athletic performance among various team sports[35]. VO_2max significantly contributes to repeated sprint capacity, total distance covered, and the number of ball contacts made during football matches[36]. Modern football relies on more complex technical skills, tactical developments, and increased physical demands. Over the past decade, an observed trend is an increase in the distance covered by players during matches. For instance, the average distance covered varies from 8500 m in 70 minutes to around 11000 m in 90 minutes. However, the total distance covered only represents a superficial aspect of match analysis. Such activity demands the highest energy expenditure. During a football match, players in different positions cover different distances, with midfielders covering approximately 11.4 km, defenders 10.1 km, and forwards 10.5 km. Thus, a range of 8-11 km is typically covered in a single match[37].

In European leagues such as Germany, Italy, Spain, teams have been observed to gain points or victories when maintaining prolonged ball possession. The relationship between total running distances and team success or match outcomes is not solely determined by running distances. The correlation between the match results and the covered distances is unique to each team and varies based on their structures[38]. In a study by Hoppe et al. (2015)[39], while the match running performance alone did not significantly correlate with match outcomes, there was a positive and significant correlation between ball possession and match running performance. The study concluded that in the Bundesliga, success was more associated with technical and tactical skills related to ball possession rather than running performance. A study on Italy's Serie A League found that teams in the top five positions covered less total distance compared to teams in the bottom five positions[40]. Another study focusing on the Chinese Super League in the 2014 season revealed that teams in the top four positions covered less total distance compared to teams in the bottom four positions[41]. A study analyzing the Turkish Super League for the 2016-2017 season identified Konyaspor, which finished 10th, as covering the highest distance and Antalyaspor, which finished 5th, as covering the least distance[42]. During the 2014 FIFA World Cup, no significant difference was found between the total distances covered by teams that won or lost matches, indicating that the total distance covered did not statistically affect match outcomes[43]. A recent study on the Bundesliga concluded that running distances did not have a significant impact on match success[44]. During the 2018 FIFA World Cup, matches that ended in victory saw an average distance covered by all team players of 104.47 km, whereas matches ending in defeat recorded an average of 104.60 km for the entire match. The results of the movement analysis statistical findings indicated no significant difference between groups[45].

In our study, when analyzing the average running distances, ranking, and estimated oxygen consumption capacities of the countries that participated in the FIFA Women's World Cup in 2011, 2015, 2019 and 2023; For the 2011 FIFA Women's World Cup, when examining rankings based on performance, Japan (10470m), the United States

(10990m), Sweden (10220m), and France (10480m) occupied the top four spots in average running distance. When analyzing based on running distance, the United States (10990m) secured the second place, England (10805m) reached the quarter-finals, New Zealand (10760m) advanced through the group stage, and Canada (10580m) also completed the group stage. When considering estimated VO_2max for the 2011 FIFA Women's World Cup, the United States (70.61 ml/kg/min), England (69.23 ml/kg/min), New Zealand (68.9 ml/kg/min), and Canada (67.56 ml/kg/min) were calculated. Among the countries with the highest average running distances, only the United States (10990m) secured a spot in the top four rankings (Table 1).

For the 2015 FIFA Women's World Cup, when examining rankings based on performance, the United States (11030m), Japan (11050m), England (10886m), and Germany (11272m) claimed the top four spots in average running distance. Analyzing based on running distance, Costa Rica (11299m) reached the group stage, Germany (11272m) secured the fourth place, Sweden (11268m) reached the round of 16, and Canada (11141m) advanced to the quarter-finals. In terms of estimated VO_2max for the 2015 FIFA Women's World Cup, Costa Rica (72.91 ml/kg/min), Germany (72.71 ml/kg/min), Sweden (72.68 ml/kg/min), and Canada (71.74 ml/kg/min) were calculated. Among the countries with the highest average running distances, only Germany (11272m) secured the fourth place (Table 2).

For the 2019 FIFA Women's World Cup, when examining rankings based on performance, the United States (8671m), the Netherlands (7890m), Sweden (8337m), and England (9015m) claimed the top four spots in average running distance. Analyzing based on running distance, Australia (10420m) reached the round of 16, Nigeria (10162m) reached the round of 16, Germany (9902m) reached the quarter-finals, and Brazil (9574m) reached the round of 16. In terms of estimated VO_2max for the 2019 FIFA Women's World Cup, Australia (66.36 ml/kg/min), Nigeria (64.44 ml/kg/min), Germany (62.50 ml/kg/min), and Brazil (60.06 ml/kg/min) were calculated. None of the countries with the highest average running distances managed to secure a spot in the top four rankings (Table 3).

When examined in terms of rankings based on the distances covered during the 2023 FIFA Women's World Cup, the top four positions were secured by Spain (7359m.), England (7858m.), Sweden (7490m.), and Australia (8065m.), respectively, in terms of average running distance throughout the tournament. Analyzing the 2023 FIFA Women's World Cup according to running distances, Australia (8065m.) claimed the 4th position, France (7913m.) reached the quarter-finals, England (7858m.) secured the 2nd position and also reached the quarter-finals, and Japan (7802m.) concluded the tournament at the quarter-final stage. In terms of the estimated VO_2max during the 2023 FIFA Women's World Cup, Australia (48.82 ml/kg/min), France (47.68 ml/kg/min), England (47.28 ml/kg/min), and Japan (46.86 ml/kg/min) were calculated Among the countries exhibiting the highest average running distances in the 2023 FIFA Women's World Cup, England and Australia were positioned within the top four ranks (Table 4).

CONCLUSIONS

Upon examining the above findings, it is evident that in the FIFA Women's World Cup tournaments held in 2011, 2015, 2019, and 2023, only a few teams with the highest running distances managed to achieve top rankings (top four). While the total running

distances of teams play a significant role in determining their success and influencing match outcomes, it is clear that this factor alone is not the sole determinant of success. Attaining success requires a combination of various factors, including match running performance, as well as unique technical, tactical, and systemic approaches tailored to each match. It is believed that success in football is not solely reliant on running performance, but also on other technical and tactical skills that play a pivotal role in the overall outcome of matches. Consequently, it can be concluded that while covering a greater total distance and therefore having a higher maximum oxygen consumption are important factors, they are not sufficient in isolation to secure victory in matches, and they do not directly determine the final match outcome.

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