



EVOLUTION OF 20KM & 35KM WALKING PACE STRATEGY OF WOMEN'S "BUDAPEST 2023"

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Abstract: This study aims to Comparing Pacing Profiles between speed ratio for 20 and 35 km race walking athlete ,also to identify the prediction ratio of achievement record for 20 and 35 km race walking athlete , the researcher used the descriptive method , the research sample consisted of athletes participating Budapest 2023 20 and 35 km race walking , the researcher used Excel version 2021 in processing data and chart analysis , the researcher reached prediction ratio of achievement record depends on race stages ,also reached the speed ratio approach in 20 and 35 km race walking .

Index Terms: achievement record , race walking, Budapest 2023.

I. INTRODUCTION

Race walking is a component of the athletics program at the Olympic Games and all significant athletics competitions. (Arcelli ,1996) Race walking is an atypical manner of walking that has specific guidelines, which stipulate that there must be no apparent loss of contact and that the knee should be straightened between the initial contact with the ground and the upright position. (World athletics Competition rules (2023).

Race walking is a progression of steps in which the walker makes contact with the ground, so that no visible (to the human eye) loss of contact occurs. the advancing leg must be straightened (i.e., Not bent at the knee) from the moment of first contact with the ground until the vertical upright position. (World athletics Competition rules, 230 ,2023)

The race pace, which is affected by a decrease in stride length during the race, was more influenced by muscular fatigue than constant training speed. Further analysis of the pacing strategy showed opposite finding with a "negative split" (an increase in speed in the last part of the race) in 20 km men and women winners. On the contrary, in 50 km race (speed decreased at the end) (Hanley 2013).

Such constraints lead to a certain stability of the movement structure in race walking, especially in the first half of the support phase (Preatoni, La Torre & Rodano, 2006). However, even though the kinematics seems to be stable, the coordination of the body segments varies in a certain range, and changes occur under the influence of fatigue. All previous studies in race walking discussed this problem on the basis of single (Neumann, Gohlitz & Ernst, 2005; Hanley & Drake, 2007).

Because of the implications of this rule, previous researches in race walking have focused on the knee's movement during the stance phase rather than during swing. However, the swing phase might also be affected by the rules of race walking, thereby having an influence on key kinematic variables such as stride length and making it different from distance running technique. (Donà G. et al 2009) , HANLEY, B. et al (2011).

The ability to control an athlete's speed during a race is known as pace strategy, enabling them to complete the race in a shorter time (Foster,et.al.,2004),In race walking, the most important factor in competitive

success is speed, although this is restricted by the two unique rules of race walking technique. At the most basic level, speed is determined by step, or stride length and stride frequency.

In relation to racing, the tempo or pace strategy is: (a) sprinting for up to 40 seconds; (b) short-distance running for 40 seconds to several minutes; (c) medium- and long-distance running, as well as overtime that lasts for hours (Thompson,2014),(Aschenbrenner.et.al.,2006) had investigated the tactics and technique of race walking at the 2004 Athens Olympics. (Ruchlewicz et al.,2006) studied the tactic of race walking, based on measurements made in athletes on a floor meter. It is common knowledge that early in a race, competitors shouldn't run high speed early in their race. Elite athletes frequently complete a distance faster in the second half than the first. (Hanley et al 2011).

After the World Athletics decided to change the 50km race walk to 35km race for men and women, the raised surprise was the women's races, where the same female competitors in the 20 km & 35 km race walk won, with almost the same arrangement for the first three places, which contributed to an attempt to evaluate the performance of the female athletes in the two races in an attempt to know the strategies they used in the two races to obtain the first three place, despite the short duration of the two races, which means that the training was based on reducing the duration of recover from the 20 kilometer race walk, as well as following a strategy that works to maintain increasing speed rates and delay fatigue from one stage to another during the race, whether 20 or 35 kilometers race walk.

II. PURPOSE

The aim of this study was to investigate the development of walking the Pacing Strategy Profiles of elite female athletes in the 20km and 35km of race walking. The significance of this research lies in its potential to expand theoretical knowledge and apply the methodology of analyzing race data in future events.

III. METHODS :

The following methods were used to address the set tasks: analysis of scientific and methodological literature and score-sheets, pedagogical observations, and statistical analysis. The Researcher analyzed competitor's achievement record for 20 and 35 km women race walking in World Athletics Championships "Budapest 2023" 19-27 /8/2023

20 August 2023, Start Time at 7:15 Temperature 21°, Humidity 88% , End Time :8.59, Temperature 26° ,Humidity 72%, 24 August 2023, Start Time :7:00 Temperature 22°, Humidity 81% , End Time :10.25, Temperature 22° , Humidity 60%,

Dependent variables: The performance of top-level women athletes in the race of 20 km.&35Km.The individual times of the athletes in the predetermined sections of the track, as well as their pace strategy.

Research Design: the race distance was divided into 4 stages of 5km. each for 20km,and 7 stages for 35km. By analyzing the individual distances and times of the athletes, their respective pace strategies were determined, which revealed the tactics used by the athletes during the race.

IV. SAMPLE :

The top three athletes completed the 20Km. &35km. women race walking World Athletics Championships "Budapest 2023"19-27 /8/2023

V. RESULTS :

Table (1)Time, Speed average (m/s) per stages and place for the 20 km winner walker in Budapest 2023

Name	RESULT	COUNTRY	Stage1	Stage2	Stage3	Stage4	Whole
María PÉREZ	1:26:51	ESP	21:44	21:59	22:21	20:47	
			3.83m/s	3.79m/s	3.73m/s	4.01m/s	3.87m/s
			5	2	4	1	
Jemima MONTAG	1:27:16	AUS	21:44	21:59	22:21	21:12	
			3.83m/s	3.79m/s	3.73m/s	3.93m/s	3.82m/s
			2	3	3	2	
Antigoni NTRISMPIOTI	1:27:26	ITA	21:44	21:59	22:21	21:22	
			3.83m/s	3.79m/s	3.73m/s	3.903m/s	3.81m/s
			4	5	1	3	

The results of the table indicate the time of each stage of the race and the average speed of each stage of the race, as well as the position of the athletes in each stage during the race.

Table (2) The time difference between each stage and Average Time (A.T.) of the stages average for the 20 km winner and time gain.

Name	Stage1	Stage2	Stage3	Stage4	A.T.	Gain	Actual	Predicted
María PÉREZ	0:19	0:34	0:56	0:38	21:25	-71s	1:26:51	1:25:40
Jemima MONTAG	0:02	0:21	0:43	0:26	21:38	-40s	1:27:16	1:26:36
Antigoni NTRISMPIOTI	0:01	0:16	0:37	0:21	21:43	-33s	1:27:26	1:26:53

The results of the table indicate the time difference between each stage, the average time of each stage, and the total time that can be eliminated from athlete's results.

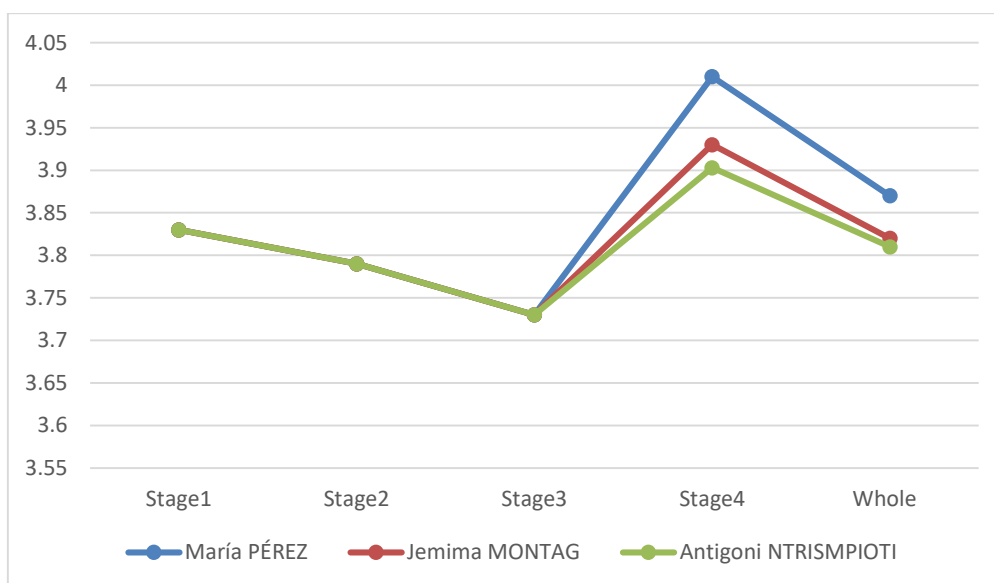


Figure (1) Speed average (m/s) per stages (5Km per stage) for the 20 km winner walker in Budapest 2023

Table (3) Time, Speed average (m/s) per stages and place for the 35km winner walker in Budapest 2023

Name	RESULT	COUNTRY	Stages							Whole
			1	2	3	4	5	6	7	
María PÉREZ	2:38:40	ESP	23:39	23:05	22:57	23:00	22:01	22:09	22:39	3.68m/s
			3.52m/s	3.61m/s	3.63m/s	3.62m/s	3.79m/s	3.76m/s	3.68m/s	
			3	2	3	1	1	1	1	
Kimberly GARCÍA	2:40:52	PER	23:39	23:05	22:58	23:02	22:22	22:40	23:12	3.63m/s
			3.52m/s	3.61m/s	3.63m/s	3.62m/s	3.73m/s	3.68m/s	3.59m/s	
			5	5	5	2	2	2	2	
Antigoni	2:43:22	GRE	23:39	23:05	22:57	23:06	22:23	23:52	24.20	3.57m/s
			3.52m/s	3.61m/s	3.63m/s	3.61m/s	3.73m/s	3.64m/s	3.42m/s	
			7	4	4	4	3	3	3	

The results of the table indicate the time of each stage of the race and the average speed of each stage of the race, as well as the position of the athletes in each stage during the race.

Table (4) The time difference between each stage and Average Time (A.T.) of the stages average for the 35 km winner and time gain.

Name	Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	A.T.	Gain	Actual	Predicted
María PÉREZ	0:52	0:18	0:10	0:13	0:46	0:38	0:52	22:47	1.01	2:38:40	2:37:39
Jemima MONTAG	0:40	0:06	0:01	0:03	0:37	0:19	0:14	22:59	0:06	2:40:52	2:40:46
Antigoni NTRISMPIOTI	0:22	0:12	0:20	0:09	1:05	0:35	0:43	23:17	0:02	2:43:22	2:43:20

The results of the table indicate the time difference between each stage and the average time of each stage, the total time that can be eliminated from the athlete’s results .

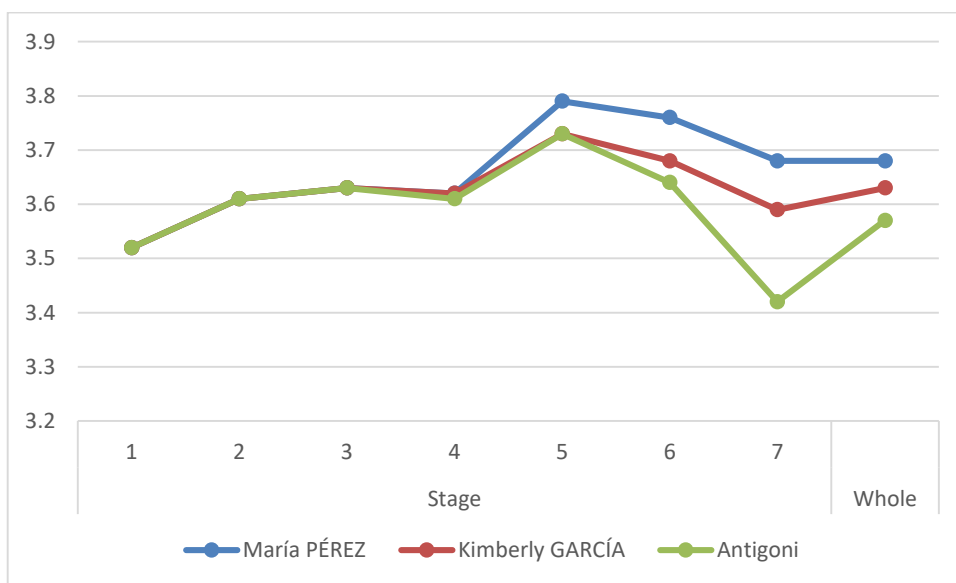


Figure (2) Speed average (m/s) per stages (5Km per stage) for the 35 km winner walker in Budapest 2023

VI. DISCUSSION:

The optimal tactic at the race is the constant passes of the athletes at a speed equal to the average speed. After all, the tactics of walking, like all long-distance roads, must be accompanied by specialized technique and speed distribution (Hanley, et al.2018) The results of the table (1 & 2) It is clear that the average speed of the first stage is higher, while the average speed decreased in the second and third stages, then the average speed increased in the final stage of the race. The distinguishing stage in the race, as it was noticed, that the three female athletes were positioned at the front of the race with fixed speed indicators for them, while in the last stage of the race, the speed rate of each athlete changed, which shows the special endurance of the 20km. walking race for women.

The change in speed for the first three racers began at 16km.for the female athletes that is in the fourth and final stage of the race. This means that the athletes have an energy to increase speed in the final stage of the race, which indicates that the athletes have strategies to maintaining technique. Although the walker of the first place had speed increase in the last stage, she made a time gap to the other walkers (4.01 m/s) but at the finish line the time gap between the first and second place 36 sec. and time gap between the first and third place 27 sec. The start of the separation of the athletes came in the fourth stage only, and this may be due to the lack of endurance for the race, with the fear that the athlete in second place will receive a warning for a bend in the knee, and this may explain the attempt of the athlete to continue in the race without being disqualified, which led to a slight decrease in the rate of speed and retention. In second place. also, it requires that the athlete must distribute the effort during the various stages of the race and maintain speed without prejudice to the legal rules of the race walking competition, and it requires the efficiency of the respiratory system, and the efficiency of the muscular system.

The results of the table 3 & 4 indicate to the time of each stage of the race and the average speed of each stage of the race, as well as the position of the athletes in each stage during the race. It is clear that the average

speed of the first stage is higher, while it began to increase until the athletes reached the fifth stage. The average speed in the second stage and the third, then the rate of speed increased in the last stage of the race, and these stages were the difference in the race, as it was observed that the three female athletes were positioned at the forefront of the race in speed rates until the sixth stage of the race, then the decline in the rate of speed increased clearly in the seventh stage of the race, which indicates a lack of endurance for the 35 km race walk for women

VII. RECOMMENDATION:

- Attention to speed development training of performance for 20 km race walking athletes.
- Attention to special endurance development for 35 km race walking athletes.
- Focus on strength training exercises for 20 km and 35 km race walking athletes.
- Training the athletes with modest times in the 20 km race walking to participate in the 35 km race walking.

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