

THE EFFECT OF USING A DISABLING FORCE TRAINING TOOL ON WALKING PERFORMANCE: AN ANALYTICAL STUDY OF TIME AND STEP LENGTH IN THE 20 KM WALKING RACE EVENT FOR APPLICANTS

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Abstract

The importance of this research is demonstrated in highlighting the benefits of using the assistive training tool known as the “Mass Suit”, which relies on elastic cord technology integrated into the disabling strength training system during walking events. This system allows walking exercises to be performed very effectively, as the effort is combined with the resistance of the ropes on the same muscle group used in normal performance. The research aims to evaluate the effect of this tool on developing stride length and reducing stride time among athletes participating in race walking.

The results show that the exercises performed using the respective tool had a positive effect on increasing stride length and reducing stride time on the ground. In addition, an improvement in completion time was observed for different distances, including 10 and 20 kilometers. In light of these results, the researcher recommends using the “Mass Suit” training tool at the end of the main part of the training sessions, with a focus on adjusting the level of use so that it is consistent with the individual’s energy needs. It is also preferable to organize exercises in moderation, focusing on training once or twice a week, especially on hill training days.

Introduction

Introduction to the research and its importance

Athletics contains several events, and one of these events is the walking race, which is characterized by special requirements such as technical performance and physical fitness, which are among the pillars of achieving victory in races. Endurance of strength is of special importance because it is the ability of the athlete to maintain the best performance for the longest period of time, since Walking is a long-distance event. It is important to maintain performance, and any decrease affects performance and achievement in the race. (Naif& Hussein al-Maliki, 2020) From the researcher’s review of the results of the Arab Championship (19), he found that there was a discrepancy between the level of the Iraqi player and the player in first place, as the difference between the two timings was approximately (9) minutes, although there are several reasons for this difference, but one of the clear reasons is a weakness in the length of the

competitor's stride and Great step time.(Hameed, 2020)Due to the great importance of both the length and time of the step on the completion and race time, and it is known that the use of the obstructing top can change the mechanism of movement and thus affect the competitor's performance, especially since the effectiveness depends on the correct technical performance, the researcher resorted to using a tool that allows the performance of the exercises to match the form of the technical performance with Using disruptive force and thus targeting the same working muscles, whether without performance or with the use of the tool (Tawfeeq, A., & Jalal, 2019). The importance of the research lies in knowing the extent of the development of the length, time, and achievement of walkers through the use of (Mass Suit), which (depends on Rubber ropes with a disabling strength training system, which allows walking exercises to be performed within the conditions of the technical performance of the event. (Easa et al., 2022)

Research problem

The length and time of the step are important elements for achieving victory in tournaments, and because the researcher is a practitioner of this event, he found a disparity between the level of players, whether in the Iraqi Club Athletics Championship or the Arab Championship, between the Iraqi player and the players in the first three places, and one of the reasons for this difference was the large difference. In terms of step length and time, the researcher moved towards using a system of strength training with rubber ropes, provided that the exercises match the form of artistic performance, so he used (Mass Suit)

Research objectives

1. Preparing strength training exercises using the Mass Suit.
2. Identify the effect of disruptive strength exercises using the Mass Suit on the stride length of the 20 km walking event for applicants.
3. Identify the effect of strength training exercises using the Mass Suit on the step time of 20 km walking event athletes for applicants.
4. Identify the effect of strength training exercises using the Mass Suit on the achievement of the 20 km walking event for applicants.

Research hypotheses

1. There is a relationship between the effect of strength training exercises using the Mass Suit on the length of the 20 km walking event for applicants.
2. There is a relationship between the effect of strength training exercises using the Mass Suit on the effective time of walking 20 km for applicants.
3. There is no relationship between the effect of strength training exercises using the Mass Suit on the completion of 20 km for walking event athletes.

Research areas

- Human field: Men's walking race event players for (Al-Shorta, Basra, Al-Mina') clubs for the sports season (2017-2018)
- Time frame: The period from 4/18/2017 to 7/27/2017.

Spatial field

1. Track and field at the College of Physical Education and Sports Sciences/University of Baghdad - Al-Jadriya.
2. Al-Hashimiya Sports Stadium, affiliated with the Ministry of Youth and Sports / Al-Hashimiya - Babil Governorate.

Research methodology and field procedures

Research methodology: An experimental design was used for one group (experimental) with a pre- and post-test

Study sample: The research sample was chosen intentionally from players participating in the Iraq Club Championship for the season (2017-2018). The number of the sample was (3) players for the year (2017-2018), and their percentage constituted (37.5)% of the original research population of There are (9) players.

Research devices and tools and means of collecting information:

Means of collecting information

1. Tests and measurement.
2. Video recording of pre- and post-tests.

Devices

1. One (Acer) computer.
2. Samsung video camera (1)
3. A medical scale to measure weight.
4. Heart rate watch (Timex - T5J031) (3)
5. Stopwatch number (3)

Tools

1. Training tool (Mass Suit) number (2)
2. Whistle.
3. Camera tripod (1)

Tool (Mass Suit)

It consists of: the jacket, belts and ropes (there are two types of ropes, medium strength and maximum strength), the weight of the jacket is (610) grams, and the weight of the jacket with (10) ropes is (1.710) kilograms. The tool is used in training as it is based on a system because of the obstructive force through the resistance imposed by the ropes, and because they are worn on the body and attached to the joints, they allow resistance to the muscles and joints during performance. Pulling the rope begins as soon as the jacket is put on and the ropes are tied to it. The researcher believes that the resistance is highest in the tension phase of the front and back and is least. In the foot swing phase. Table (1) shows the degree of resistance of each rope

Table (1) shows the resistance strength of ropes

the number	Regions	Intensity of resistance	Rope type
1	Foot, Elbow (can be placed on the knee)	lbs 7.5 kg (3.401)	Golden rope maximum) (intensity
2	Palm, Foot, Elbow (can be placed on the knee)	lbs 5.5 kg (2.494)	Silver rope (medium intensity)

Field research procedures

Tests used in the research

km walking test (253:7)

Purpose of the test: To measure the achievement of advanced walkers.

Necessary tools: whistle, record, stopwatch.

Performance method: The tester stands behind the starting line, then starts off with the sound of the whistle and walks to the finish line, and an attempt is given to each player.

Registration: It is per hour and its parts.

It was conducted on the main road to the entrance to the University of Baghdad, as in picture (21), whose length was (1250) meters and which was measured using a special wheel to measure distance, and the number of laps was (16) laps for a total of (20) km, and so that the researcher could be sure of the In order not to violate the law by running, he placed four referees from two federations (licensed by the Iraqi Athletics Federation) from the assistant work team to monitor the testers if he ran instead of walking, and set up one irrigation station, in addition to the presence of two doctors for emergency cases, with two timers (3). And calculate the number of cycles (1)

Exploratory experience

The researcher conducted the first exploratory experiment on Wednesday, Thursday, and Friday (29-30-31/3/2017) at exactly 5 p.m. on the track of Al-Hashimiya Stadium, affiliated with the Ministry of Youth and Sports - Babil Governorate, to find out the extent to which the intensity used was compatible with the ability of one player. The research sample included the use of the training tool (Mass Suit)

The second exploratory experiment took place on Sunday, April 16, 2017, to determine the test (place, time, and weather conditions), the appropriate location for filming, and to identify the obstacles that the researcher may face during the implementation of the main experiment. The starting line was determined, and the course distance was measured, which was (1250) metres.

Pretests

The pre-tests were conducted by the assistant work team and under the supervision of the researcher at five o'clock in the afternoon on Tuesday, April 18, 2017, at the Hashemiya Stadium track in Babil Governorate, in order to conduct the Rockport test and strength endurance tests. On Thursday, April 21, 2017, a test was conducted. Walk 20 km on the main street to the entrance to Baghdad University.

Application of exercises

The exercises began to be implemented on Friday, April 28, 2017, and continued until Friday, June 22, 2017. Thus, they continued for 8 weeks, 4 units per week. The total number of training units was 32 training units, and the exercises were performed within the last part of the main section. A period of time (20-45 minutes) of the total training unit time, and the training load was graduated in a ratio of 1:3. High and low-intensity interval training and continuous training were used in the exercises. The intensity was calculated through the Carvonon equation for heart rate (21:2.7)

$$\frac{\left(\text{معدل ضربات القلب أثناء الراحة} + \left(\text{الشدّة المستهدفة} \times \left(\text{النبض القصوي} - \text{معدل ضربات القلب أثناء الراحة} \right) \right) \right)}{100} = \text{الشدّة المطلوبة}$$

$$\left(\text{النبض القصوي} \right) = 205.8 - \left(0.685 \times \text{العمر} \right)$$

Figure (1) shows the carvonone equation

Table (2)Shows the intensity used in the exercises

(3000) meters	meters (1200)	(100,200,300,400) meters	table	
75-60	85-70	90-75	65-50	%Intensity

Posttests

The researcher conducted the post-tests under the same sequence and temporal and spatial conditions in which the pre-tests were conducted on Tuesday, June 27, 2017, for the Rockport test and the strength endurance tests, and on Friday, June 30, 2017, for the 20 km walk test.

Statistical methods

T-Test for independent samples

Chapter Four: Presentation, analysis and discussion of the results

Presentation and discussion of the results of walking time for the distance (first 10, second, 20) km before and after:

Table No. (3) shows the results of the walking test for the first and second (10) km before and after

Indication	Indicative values (sig)	T calculated	A	H	F	A	F	SF	A	s	measuring unit	Variables
before	0.010	9.807	0.42	0.74	4.19	1.36	53				minute	Tribal 10Time of the first after me km
after	0.050	4.31	1.23	2.14	5.34	4.05	54.93				minute	Tribal second/km 10Time after me
before	0.029	5.775	1.64	2.85	9.50	5.19	108.07				minute	Tribal km 20Time after me
after						2.70	98.56					

Each value in the significance value field (sig) < 0.05 is significant in degrees of freedom (2) Table 3 shows that there are significant differences in the time of 10 km (first and second). The researcher believes that there is a difference between the time of the first and second (10) km in the pre-test, which was approximately (53) minutes, and the time of their completion of the (10) km race in the Iraqi clubs, which was (46-47) minutes, which is a big difference between the two times, and this weakness The researcher explains this because the official distance for the walking event in Iraq is 10 km, while it is designated only for the category of young men and women according to the law of the International Association of Athletics Federations, while the official distance for applicants competing in international championships is (20.50) km, whether for men or women. This was reflected in the training programs for the players, as they began to aim to achieve achievement in (10) km. Therefore, the 10 km/s time decreased and individual differences between players expanded. (Mondher, H. A., &Khalaf, 2023)

As for the post-test, we find that the difference between the first and second (10) km has developed and approached their real levels. The researcher attributes this to the exercises and the use of the training tool, which worked to increase strength endurance and then the competitor's ability to maintain his speed throughout the duration of the race (Nazar, T). , & Aladdin, 2018), and from the researcher's point of view, the contestants did not have confidence in their abilities to achieve such a time in the post-test, and this was a natural result because the players did not

take a test with a distance like this except in the pre-test, which left a bad impression as the contestants stayed for days Many suffer from muscle pain as a result of the long distance of the test, as well as disappointment as a result of the time achieved, and the competitor’s lack of knowledge of his ability that has developed after training. (Kzar&Kadhim, 2020)

As for the time (20) km, the researcher believes that the reason for the appearance of the significant difference is due to the development in the time of the first and second (10) km, especially since the time difference between the pre-test and the post-test was (10) minutes, which is a big difference, especially since this time was achieved during two months of exercises. Only, but they were not low-intensity exercises, and the sample also had the ability to raise its level. It only needed an increase in strength endurance, and by calculating the amount of resistance that was imposed on the player during the first week (254,884) kg. Of course, this resistance on the player must He overcomes it throughout the performance period, which totaled approximately (2) hours of training only. (Gree&Attiyah, 2022)

One of the indications that there has been a development in personal endurance, especially in force endurance, is that the changes were at the level of the energy houses and muscles, as it is known that the body after performing a physical effort returns energy in proportions greater than the amount expended, and this is according to the theory of (excess compensation) (232:3). Therefore, if A change in strength and endurance occurs through a change in the level of energy stored in the body. Although the training was not within a distance of (20) km or even close to (12) km, the great resistance imposed on the entire body during the exercises depleted energy and because the body works to restore energy, but in a larger quantity (13:4). Among its results was an improvement in completion time, and the best result was the relative stability of performance. (Hashem&Qasem, 2021)

Discuss stride length

Table(2)It shows the arithmetic means and standard deviation between the results of the pre- and post-tests at step lengths of 1, 10, and 19 km.

km 19		km 10		km 1		n	Variables	
deviation	the middle	deviation	the middle	deviation	the middle			
10.29	71.40	11.15	70.46	6.34	80.44	3	Tribal	Step length
31.79	100.39	5.38	89.53	22.21	92.77	3	-Al Baadi	

From Table No. we find that the arithmetic average step length for the 1 km pre-test was 80.44, and for the post-test it became 92.77, the 10 km pre-test was 70.46, the post-test was 89.53, the 19-km pre-test was 71.40, and the post-test was 100.39. This indicates that there has been a development in favor of the post-test. The researcher attributes this development to the fact that Although the step length in the pre-test was decreasing and this resulted in a weakness in

physical fitness, especially strength endurance (Mahmood et al., 2023), in the post-test we find that there was an increase in the step length between 1 and 10 km, while 10 km decreased and 19 km increased to 1 meter, and here the players approached the world level in step length, but even the step length decreased at 10 km, but the level of decrease was less than the pre-test. The development of step length is a result of the development of strength and strength endurance as a result of various exercises, as the exercises aimed to develop walking speed during the 100-400 meter exercise, and to develop personal endurance and the maximum oxygen consumption at a distance of 1200 metres, while private endurance through 3000 metres, and general endurance. It was for 35 minutes. (Mousa, A. M., &Kadhim, 2023)

Discuss step time

Table(3)It shows the arithmetic means and standard deviation between the results of the pre- and post-tests for step time at 1, 10, and 19 km.

km 19		km 10		km 1		n	Variables	
deviation	the middle	deviation	the middle	deviation	the middle			
0.05	0.62	0.07	0.49	0.13	0.54	3	Tribal	Step time
0.05	0.47	0.01	0.44	0.13	0.51	3	Baadi-Al	

From Table No. we find that the arithmetic mean step time for the 1 km pre-test was 0.654, and for the post-test it became 0.51, for the 10 km pre-test it was 0.49, for the post-test it was 0.44, for the 19 km pre-test it was 0.62, and for the post-test it was 0.47. This indicates that there has been a development in favor of the post-test (Sabhan, H., &Thamer, 2018), and we find that the time in the pre-10 km race decreased, while in the 19 km it increased, and this is evidence of weakness, which is when compared with international players. As for the distance time, the time was less than the pre-match, and this is a result of the development of strength and strength endurance, but we find that the level of the distance time The step has stability in performance.(Ahmed FadhilFarhan Mohammed JawadKadhim, 2016)

Conclusions

The researcher concluded the following:

1. The exercises prepared by the researcher using (Mass Suit) led to an improvement in step length and step time.
2. The exercises prepared by the researcher using the Mass Suit had an effect on the development of the completion time for the first and second 10, 20 km.

Recommendations

1. The researcher recommends increasing the effective distance of walking in athletics championships from (10) km for applicants to (20) km due to its impact on the training curricula of the players and the attempt to raise the level of the Iraqi competitor.

2. The training tool (Mass Suit) should be used at the end of the main section due to its large energy requirements, unless the main section is used only for training.
3. The researcher recommends that the number of training times per week be (1-2) times, especially on the day the athlete must train strength training, strength endurance training, or height training, because they serve the same purpose.
4. Using the Mass Suit with short, medium and long distance running events, to know its effect on achievement and kinematic variables.
5. Using Mass Suit with feminist groups and knowing the effects of its use.

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