

The impact of specific training on some special physical variables and the score level of the 5000-meter walking race juniors

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Research Introduction and issue:

Scientific research and studies in the field of sports aim to raise the level of sports achievement and reach the achievement of records by developing training methods to raise the capabilities of the athlete in all directions required by the type of sport practiced. Some modern training programs have proven their effectiveness in order to reach the desired goal of high performance rates among players.

Mohammed Ibrahim Shehata (2014) states that one of the main duties of the sports training process is to prepare the player physically to meet the requirements of sports activity, which lead to the advancement of the training status of the player to reach the following levels in the exercised sports activity, and therefore physical preparation is the applied process to raise the level of the training status of the player by providing him with physical and motion fitness. (50:10).

Zaki Mohammed Hassan (2002) points out that sports training is the main part of the sports preparation process as a special educational physical process based on the use of physical exercises in order to develop various necessary qualities to improve the level of performance practiced. (29:4).

Recently, several recent trends have emerged in the training of sports skills, including the use of **qualitative or specific exercises**, this type of exercise, which reaches the maximum degree of specialization in the development of skilled and physical performance in quantity and quality, according to the real-time uses of muscles or muscle groups within performance to practice the type of specialized sports activity (from this point of view, sports training can be viewed as a process in which different training methods and styles are developed and used with the aim of changing the trainee's status according to a predetermined goal (20:17)).

Muhammad Ali Hassan (2007) believes that specific training can lead to economicization in time and effort and work to provide safety for the player, and we can reach the highest levels of difficulty that may make targeted skill performance easier, which shows the impact of specific training in the development of physical qualities of desired skill performance (42:13).

Heather Sumulong (2008) adds that specific training like performance is one of the main components that must be developed for athletes through codified training programs, as performance improves better if the training is specific to the type of activity and includes the most important active muscles by giving exercises that are similar in performance of the nature of the skill in terms of correct shape and the range of motion, which leads to improve physical abilities. (203:20)

Mirek and others (2007) point out that the development of skill and score performance in track and field sports competitions requires a lot of effort, and the amount of training and the number of training units is considered to be one of the important factors for the development of adaptation among players. Mastering motion in walking races requires a longer time than mastering performance in sprints, because the stimulation time in the motion centers of the cerebral cortex is in the first stage of training, during which many muscles are stimulated, where muscle activity is limited only to the necessary muscle groups (93:22).

Through researching various references and studies, and within the limits of the researcher's knowledge, she noticed a dearth of researches that dealt with that competition. There were also no Arab studies that dealt with that competition through the direction of study. And as the researcher is one of the Egyptian team for the walking competition. Through her follow-up to local and Arab championships tournaments in which clubs affiliated with the Egyptian Athletics Federation participate, she noticed that some players may be excluded from the race due to the emergence of legal and technical errors, as well as the appearance of fatigue on them early in the race due to the low level of physical and skill performance, as well as the failure of trainers' reliance on specific training according to a training curriculum based on scientific foundations in order to achieve the required achievement of that competition.

In this regard, **Essam Abdel Khaliq (2005), Alexander Rakovic and others (2011)** confirm that training at a single pace does not lead to

the required adaptation due to the habituation of the thrilling used and this can be overcome through the change and diversification of the methods of education, training and exercise used, that the more exercises are similar in their dynamic structure of the movement to be learned, the more learned and the better the athletic skill performance will be. (٢١٤:١٧) (٩٨:٧)

The objectives of the research:

This research aims to identify the following:

1. The impact of specific training on some special physical variables (periodic respiratory endurance - flexibility - agility – strength-endurance) of 5000 walking race juniors.
2. The impact of specific training on the score level of 5000 m walking race juniors.

Research assumptions:

1. There are statistically significant differences between the pre and post-measurement means of some special physical variables (periodic respiratory endurance - flexibility - agility – strength-endurance) of 5000 walking race juniors in favor of the post-measurement.
2. There are statistically significant differences between the pre and post-measurement means of the score level of 5000 m walking race juniors in favor of the post-measurement.

Research terms:

Specific drills:

Aweys Jebali, Tamer Jebali (2013) defined them as those exercises that are similar to the nature of the skills technical performance, and correspond to the composition of the motion performance path used in the competition, and are considered to be the direct preparation for the development of the performance level of the sports individual. (279:9)

Nashwa Mohammed Helmy and Iman Rashad (2012) defined them as exercises similar to the same skill performance and consistent with the motion path of the nature of the required skill performance. They are specialized and qualified exercises and have great connection to the basic stages of skills to be implemented according to the special requirements and the nature of skill performance. (2:13)

Research Procedures:

Research Method:

The researcher used the experimental approach using the pre- and post- measurements as it is suitable for the nature of this research.

Research Sample:

The research sample was selected in the deliberate manner consisting of (15) of 5000m walking race juniors in the military establishment in Assiut under 16, divided into (10) juniors for basic study, (5) juniors for survey study, and the juniors registered in the Egyptian Athletics Federation represent the 2020/2021 season.

Homogeneity of the research sample in variables under consideration

Table (1)
Statistical characterization of sample members in variables
(Height - Weight - Training Age)

(N = 15)

Randomization		Normality		α_3	S	\bar{X}	Unit of measurement	Variables
P- (value)	Z	P- (value)	Z					
0.31	1.01*	0.87	0.60*	0.24	2.15	153.80	cm	Height
0.73	0.34*	0.54	0.80*	1.27	2.28	52.90	kg	Weight
1.00	0.00*	0.06	1.37*	1.04	0.48	2.30	years	Training Age

*Indication at $(p) \geq (0.05)$

It is clear from Table (1) that the torsion coefficient value of the research sample in the pre measurements on the basis of which homogenization was done are limited to (+3 : -3), which indicates that the members of the sample are distributed moderately, indicating the homogeneity of the sample members.

Table (2)
Statistical characterization of sample members in some special physical variables
(N = 15)

Randomization		Normality		α_3	S	\bar{X}	Unit of measurement	variables
P- (value)	Z	P- (value)	Z					
1.00	0.00*	0.08	1.26*	3.05	0.09	6.06	min	Respiratory Periodic Endurance (Cooper) 12min

Randomization		Normality		α_3	S	\bar{X}	Unit of measurement	variables
P-(value)	Z	P-(value)	Z					
0.31	1.01*	0.58	0.78*	0.85	10.17	51.21	sec	Strength endurance Test (Blank)
0.74	0.34*	0.82	0.63*	0.27	3.83	58.00	sec	Agility test (Shuttle Run)
0.74	0.34*	0.27	1.00*	0.24	0.50	3.21	cm	Flexibility test (Divided box)

***Indication at (p) > (0.05)**

Table (2) shows the arithmetic mean, standard deviation and torsion coefficient of the research sample in some special physical variables. The data indicate that the torsion coefficient values of the research sample are limited to (+3:-3), which indicates that the sample data does not have positive or negative twists, as well as the existence of statistically significant differences in the values of random and natural tests, indicating their natural and random distribution, which confirms the equality of the sample members.

Table (3)
Statistical characterization of sample members in the digital level
For the 5000 m walking race

(N = 15)

Randomization		Normality		α_3	S	\bar{X}	Unit of measurement	Variables
P-(value)	Z	P-(value)	Z					
0.74	-0.34*	0.37	0.91*	1.16	0.75	31.92	min	Score level

***Indication at (p) > (0.05)**

Table (3) shows the arithmetic mean, standard deviation and torsion coefficient of the research sample in the score level of the walking race. The data indicate that the torsion coefficient values of the research sample are limited to (+3 : -3), which indicates that the sample data does not have positive or negative twists, as well as the existence of statistically significant differences in the values of random and natural tests, indicating their natural and random distribution, which confirms the equality of the sample members.

Means and tools of data collection:

Tools and instruments used in research:

- Athletics track
- Adhesive tags
- Measure tape
- Registration forms.
- Stop watches.
- A graded ruler.
- Cones.

Tests used in research:

Physical tests:

Physical tests have been identified that measure the variables in research.

- Cooper test (12min) to measure cyclic respiratory endurance. (12) (204)
- Strength endurance Test (Blank). (223 : 12)
- Flexibility test (divided box). (265:12)
- Shuttle running test to measure agility. (283 : 12) Attachment (3)

The researcher was able to choose the physical tests in research, which get (85%) and more based on the expert survey. Attachment (2)

- Score level measurement through a tripartite committee.
- Through the pre and post-measurements of 5000 m walking race.

And get a percentage of 13% improvement ratio based on the survey of the committee. Attachment (4)

Survey study:-

The survey was conducted from 7/7/2021 to 9/7/2021 in order to ascertain the following:

The objectives of this study are:

- Determine where the basic experiment will be applied.
- Ensure the appropriateness of the physical tests under research for the research sample.
- Ensure the validity of the tools and instruments before applying the basic experiment.
- Determine the basics of specific exercises to reach the final form.

Specific Trainings Under research: attachment (5)

Specific exercises aim to develop some of the special physical variables of the basic research sample.

Foundations of applying exercises

The researcher developed the trainings after reviewing the scientific references specialized in track and field competitions, training science and previous studies and surveyed the opinion of experts as follows:

- The time period for applying the exercises has been set for (8) weeks.
- The number of weekly training units was limited to (4) training units.
- Training unit time from (80 minutes to 120 minutes).
- Time of specific training within the training unit from (20-30 min)
- The intensity of the training program is 80-90%
- The form of performance in the exercises should be similar to the nature of the performance in the walking competition.

Training loads have been rationed according to training scientific and physiological basis, and the intensity of training ranged between 60-90% according to:

- Exercise difficulty
- Basic unit intensity
- The required distance
- Target time

A model of a training unit

Unit objective: development of speed endurance and maintain the skill performance.

Preparation period: special

Duration of training unit: 90 mins

Unit intensity: 60-80%

Program intensity: between (1:1)

Table (4)
A model of a training unit

rest	loads		Training content	duration	Unit parts
	set	repetition			
10 s	3	8-1	-(Standing) around track running (5) m. -Full body preparation exercises. -Muscle stretching ,joints flexibility	10m	warm up
10 s Between repetitions 3-2m between	2	10-8	Special preparation -specific exercises - (standing) walking arms around waist (30) m. -(standing)walking around hoops for	40-30m	Main part

sets			(50) s -(standing)walking with arms in front of the body -(standing)with whistle reverse track direction walking for (800) m - (standing) walking with leg crosses over straight line.		
۳-۲m	۱	۰	Skillful part Walking (1000) m		
			Relaxing exercises -(standing)arm swings forwards and backwards -(sitting) with bending the knees (legs pulses) -jogging around track	۱۰m	Cool down

Procedures for implementing the basic experiment:

Pre-measurement was conducted from 25/7/2021 to 28/7/2021, for physical variables and the score level (under research), and one of the objectives of pre measurement was to conduct homogeneity and equivalence of the two groups under study.

The basic experiment:

The basic study was conducted from 1/8/2021 to 1/10/2021, for a period of (8) weeks, with (4) units per week, and the time of specific training was (30-40 mins).

Post measurements:

The post measurement of the physical tests and the score level under research was carried out after the completion of the application of the training program from 3/10/2021 to 13/10/2021 under the same conditions and order of application for pre measurement.

Statistical treatments used in research:

Statistical treatments were carried out by computer using SPSS - EXCEL programs. In order to achieve the objectives of research and test the work, the researcher used the following statistical treatments:

- Arithmetic mean (\bar{X})
- Standard deviation. (s)
- Torsion coefficient (α_3)
- Kolmogorov-Smirnov(Z) natural distribution test
- Randomness test.) Z) Runs Test

- Test the significance of variances. t - Test
- Coefficient of correlation. (r)
- Improvement rates

Research results view and discussion:

First the research results presentation:

Table (5)

The significance of the differences between the pre and post measurements of some special physical variables

(N = 10)

Improvement percentage	P (value)	T	post		pre		Unit of measurement	Variables
			S	\bar{X}	S	\bar{X}		
23.59%	0.00	6.04*	0.15	7.49	0.09	6.06	lap	Respiratory cyclic endurance (Cooper) 12m
18.53%	0.01	3.11*	3.44	60.70	4.17	51.21	sec	Strength endurance test
14.31%	0.01	3.58*	1.24	73.30	3.83	85.55	sec	Agility Test (Shuttle Run)
31.25%	0.00	5.43*	0.71	4.20	0.50	3.20	cm	Flexibility Test (Split Box)

*Indication at $(p) < (0.05)$

Table (2) shows statistically significant differences between the pre and post measurements in all physical tests under research (strength endurance test (blank test) - agility test (shuttle run) - flexibility test (split box), periodic respiratory endurance test Cooper 12m) in favor of the post measurement, and improvement rates ranged from (13.27% to 31.25%).

Table (6)
The significance of the differences between the pre and post measurements in the score level for the 5000m walking race

(N = 10)

Improvement percentage	P (value)	T	post		pre		Unit of measurement	Variables
			S	\bar{X}	S	\bar{X}		
13.23%	0.00	3.70*	0.67	27.72	0.75	31.95	min	Score level

*Indication at $(p) < (0.05)$

It is clear from Table (6) that there are statistically significant differences between the pre and post measurements in the score level of the 5000 m walking race in favor of the post measurement, and the improvement rate reached (13.23%).

Discussion of the results of the first hypothesis, which stipulates that "there are statistically significant differences between the pre and post measurements in some special physical variables (respiratory cyclic endurance - flexibility - agility - strength endurance) of 5000 meters walking juniors in favor of the post measurement."

Second, discussion of the research results:

Discussion of the results of the first hypothesis, which stipulates that there are statistically significant differences between the means of the two pre- and post- measurements in some special physical variables (respiratory periodic endurance - flexibility - agility - strength endurance) of 5000 meters walking juniors in favor of the post measurement.

Table (2) shows statistically significant differences between the two pre- and post-measurements in all physical tests under research (strength endurance test (blank) - agility test (shuttle run) - flexibility test (split box), respiratory cyclic endurance test - Cooper 12m) in favor of the post measurement, and improvement rates ranged from (13.27% to 31.25%).

The researcher reduces these results to the use of specific exercises to develop the special physical variables of the 5000 meters walking competition by following the scientific foundations in the field of sports training to regulate the training loads of fitness exercises commensurate with the age of the research sample. Specific exercises work to develop the special physical abilities of the walking competition juniors by training the

active muscles in the specialized performance of competition which helps in the development of the special physical abilities positively.

Heather Sumulong (2008) confirms that specific training similar to performance is one of the main factors that must be developed for athletes through codified training programs, as performance improves better if the training is specific to the type of activity and includes the most important active muscles by giving exercises similar in performance to the nature of the skill in terms of correct shape and the extent of the range of motion and it is a main factor to improve the physical abilities (20:21)

Mohamed Ibrahim Shehata (2014) also agrees with these results through what he pointed out that one of the main duties of the sports training process is to prepare the player physically to meet the requirements of sports activity, which lead to the advancement of the training status of the player to reach the following levels of the exercised sports activity. Therefore, physical preparation is the applied process to raise the level of training status of the player by providing him with fitness and motion. (50:10)

Abdulaziz Al-Nimr and Narriman Al-Khatib (2003) confirm that performance improves better if the exercise is specific to the type of activity practiced and includes the most important muscles active in this activity and to develop them in the same way they are in competition and at the same speed of motion. (63:5)

The results of **Noura Mohammed Saeed's study (2011)** confirm that the use of Specific Exercise reaches the maximum degree of specialization in the development of physical abilities in quantity and quality, according to the instantaneous uses of muscles or muscle groups within performance to practice the type of specialized sports activity. (20:15)

Ray Parton confirms(1994) stresses on the importance of using specific exercises in the preparation phase of players and the impact of the use of specific exercises on the development of fitness elements, and this is shown when specific exercises are very special exercises and characterized by their conformity with skill performance, as the use of active muscles in the required motion performance has an effective impact on the speed of movement comprehension and thus developing the level of skill performance. (10:23)

Mohammed Hamza Al-Rahmani (2009) also mentions that specific exercises are an urgent necessity to achieve the highest level of performance in any sport because it leads to the adaptation of the physical, skill, technical and psychological abilities required for the specialized activity practiced. Specific exercises must include exercises that support and develop the capabilities of the activity practiced. (3:11)

Nemat Salah Al-Sayed (2001) confirmed that they are exercises of a special type aimed at developing some special physical abilities that are related to a special biological condition for a certain age stage. (10:14)

Khaled Farid Ezzat (2012) and Ali Al-Saeed Rayhaan (2012) confirm that specific exercises are exercises directed towards the muscles concerned with performance so that their dynamic direction is identical to the motion path of the learned skill, and it also serves only active groups in motion performance where this is in the same direction as the muscle work used to perform movements. (10:3) (45:8)

These results are consistent with the study of **Khaled Abdel Rahman Mahmoud (2010) (2), Aziza Samir Shalabi (2012) (6), Maria and others Maria K et al. (2019), (21), Alves and other (2019)(18). (17) Morteza Yaserifar et al. (2021) (22)** where the results of these studies indicated that specific exercises has a positive impact on physical variables such as flexibility, muscle ability, motion response speed, agility, and nervous control.

Discussion of the results of the second hypothesis, which stipulates that there are statistically significant differences between the means of the pre and post- measurements in the score level of 5000 meters walking juniors in favor of the post measurement.

It is clear from Table (3) that there are statistically significant differences between the pre and post measurements in the score level of the 5000 m walking race in favor of the post measurement, and the improvement rate reached (13.23%).

The researcher reduces these results to the use of specific exercises and their codification in proportion to the research sample, which led to the development of physical abilities and the level of skill performance, which

positively affected the score level of the research sample from the walking competition.

In this regard, **Bajerska J et al. (2004)** state that the main objective of training the players of the walking competition is to prepare for the performance of the race distance in the least possible time through the use of appropriate training methods to achieve this goal, by reaching the maximum aerobic endurance, building lactic endurance, and the ability to withstand the rhythm of walking. (47:18)

As **Mirek and others (2007)** explain the development of skills and score performance in track competitions, especially for walking races, requires a focus on the muscles of the walking race, which allows better mastery performance. (68:21)

Schlich M (2012) believes that Training in the walking race should focus on the technical aspects and on the specificity of the physical requirements of walking players. Stretching exercises should also be used and applied in the general preparation stage, and the development of strength with its classifications in the same movement track of the walking competition. He also indicates that the goal of developing the muscle strength of the walking competition is to use endurance exercises by muscle groups that are more active while walking in the race, to develop the functional systems of the body, the development of strength must be done in general without an increase in the cross-section of the muscles. (27:24)

Noura Mohammed Saeed (2010) stresses the need to use specific exercises because the traditional training process is not enough for the purpose of mastering skill performance or developing score levels, especially in some stages of performance with high difficulty. This confirms the importance of having a special quality of training characterized by a thorough understanding of micro-performance moments and what it needs from muscle work of a special quality during skill performance so that optimal sports performance can be reached and the level of performance can be improved. (15:15)

These findings are consistent with the study of **Amal Zakaria (2007) (1)**, **Noura Mohammed Saeed (2010) (16)**, **Alves and other (2019) (18)**, **(17)**, **Morteza Yaserifar et al. (2021) (23)**, the most important

result of which was that the specific training had a positive impact on the skill performance level and score level of the walking racers.

Conclusions and recommendations:

First, conclusions.

In view of the objectives and assumptions of the research and the procedures followed and the sample of the study, the researcher reached the following most important results:

1. There are statistically significant differences between the pre- and post-measurements in all the physical tests under research (strength endurance test (blank) - agility test (shuttle run) - elasticity test (split box), cyclic respiratory endurance test - Cooper 12m) in favor of the post measurement, and improvement rates ranged from (31.25-13.27) %
2. There are statistically significant differences between the pre and post measurements in the score level of the 5000 m walking race in favor of post measurement, and the improvement rate reached (13.23%).
3. The suggested program has shown statistically significant differences between the pre and post measurements for research sample in physical variables and score level under research

Second, recommendations.

1. The need to pay attention to the specific exercises within the daily training units because of their positive effects on the physical variables of the 5000 meters walking competition juniors.
2. Applying exercise content to different races (3k-5k-10k)
3. Conducting similar studies at different age stages from walking competition players.

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