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# The Effect of Using S.A.Q. Training on the Improvement of Special Physical Abilities and the Achievement Level of Middle-Distance Runners

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**Abstract:** The study aimed to identify the effect of using S.A.Q training on improving the specific physical abilities and achievement level of middle-distance runners. The research sample was chosen: the Palestinian athletics team players, who numbered (3) players. The most important results: There were statistically significant differences between the pre- and post-measurements and in favor of the post-measurement of the training program using the S.A.Q training for some tests, namely the vertical jump test from stability. The foot jump tests the farthest distance (10) seconds, the test of throwing a medicine ball weighing 3 kg, and the dangling test for the longest possible time. 4×10-meter shuttle run test. There were no statistically significant differences for the rest of the tests, and the average percentage of improvement for special physical abilities together was 28.48%. While the results showed that there were statistically significant differences between the pre- and post-measurements in favor of the post-measurement, the percentage of improvement for the achievement level of the 1500m race amounted to 2.66%. The researcher recommends: Adopting S.A.Q training as a basic training methodology for middle-distance runners. Circulate the publication of these results to the authorities related to athletics, especially the Olympic Committee and the various Palestinian federations, because of the benefit of these training and their targeting of speed and agility in many games. 2. Directing the Palestinian Athletics Federation towards the importance of S.A.Q training and using them in their training programs. It is necessary for the Ministry of Education to make increased efforts towards S.A.Q training, so that teachers in schools must use these training, which have a positive contribution to the players' ability.

**Keywords:** S.A.Q. Training, Specific Physical Abilities, Achievement Level, Middle Distance

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## 1. Introduction and Research Significance

The concept of sports training represents the attempt to reach the player's highest levels of specialized sports performance, which varies from one activity to another and is agreed in the general framework of training through three axes of preparation: physical, skilled and psychological preparation.

The development of training methods is key to effective development of the training process which in turn would improve the digital levels of diverse sports in general and athletics in particular. Individuals involved in the sports

industry need to be updated about the recent developments of training methods since such methods influence and could improve the digital level of sports competitions [2].

The scientific and technological advances we experience today are the hallmark of the present times. They contribute to finding scientific solutions to many problems in various fields in general and in the field of Physical Education in particular through using scientific planning for training programs and relying on the results of Physical Education related studies [4].

Physical abilities are the important basis of the training process and build on other training components and components, as the achievement of high levels of performance is largely linked to the player's ability to attain

high levels of physical abilities, including strength, speed and endurance [10].

The sport of athletics contains two types of competitions: field competitions and track competitions. The course competitions are seen to be all against time, where the player is asked to travel the distance of the race in as little time as possible, which is an enormous challenge to human potential and the implementation of this requires a large physiological capability that varies in proportions of its contribution to the achievement of the goal according to the type of competition practiced by the player in athletics [11].

The trainers are seeking everything new in training methods with a view to improving athletic performance, and Sakyō trainings are the closest to their rapid motor qualities, whether for the upper or lower limbs or both.

The results study indicate that the (S.A.Q) trainings have helped to improve the special physical abilities of handball skills (1), and another study noted that the training program using speed, agility and motor speed exercises "Sakyō" had a positive impact on some physical variables and the digital level of 110-m hurdles riders (7), as for another study It concluded that the results of the (S.A.Q) exercises improved some physical abilities, some biological variables and the digital level of the study sample in the long jump competition.

In the light of this, the researchers consider that the (S.A.Q) training is a modern training methodology, operating in a complementary manner between speed training, agility training and motor speed training within the framework of the training program [13].

#### Research Problem

Perhaps the follower of the results of the recent world championships in the various competitions of the power games, particularly the track races, finds their progress surprisingly, raising the question of sports professionals about the reasons for the huge leap in digital levels. In an effort to answer this question, one of the most important and most important reasons was the reliance of the contents of the training programmes on methods.

Based on the importance of attention to young people's training programs and the need to provide planned and structured programs through which to improve their special physical abilities and digital level Through the expertise of the researchers and their work as trainers with the category of long-distance runners in the Palestinian team, and by asking the players how important it is to use Sacco training in improving their physical abilities and digital level, they are not familiar with this type of training method, Also by asking the members of the Palestinian Athletics Federation and the rest of the coaches in the Federation system, the researchers

noted that there was an acceptance of them to try this method of training So through the foregoing, the researchers will use Sakyō training and know its impact on improving the special physical abilities and digital level of middle-distance runners.

#### Research Objectives

1. Identify the differences between the pre- and post-measurements and the rate of improvement in special physical abilities.
2. Identify the differences between the pre- and post-measurements and the rate of improvement in the Achievement level.

#### Research Hypotheses

1. There are statistically significant differences between the pre- and post-measurements and the rate of improvement in special physical abilities and for the post-measurement results.
2. There are statistically significant differences between the pre- and post-measurements and the rate of improvement in the Achievement level and in favor of the post-measurement results.

#### Research Limitations

1. Objective threshold: Recognize the impact of the use of (S.A.Q) drills on the improvement of special physical abilities and the digital level of middle-distance runners.
2. Human limit: The study was applied to the Palestinian middle-distance players in the southern governorates.
3. Spatial limitation: the pre- and post-measurements were taken and study applied at Yarmouk Stadium in Gaza City.
4. Time limit: Measurements and training program were implemented during the period of the sports season 2022-2033 AD.

## 2. Methodology

*Research methodology:* The researchers followed the empirical approach as it suits the nature of this research. Pre- and post-measurement tests were applied to the experimental group.

The researcher selected the sample of the research in a deliberate manner and they are the Palestinian middle-distance athletics team's players and their number (3) three players.

#### Homogeneity in the sample

The researchers calculated the mean, standard deviation, median and the torsion coefficient of the variables under study.

The main variables are the age, age training, height and weight.

#### Research Sample

**Table 1.** The mean, standard deviation, median and the torsion coefficient of the variables under study.  $n=3$ .

Variables	Measurement unit	Mean	Standard deviation	Median	Torsion coefficient
Main variables					
Age	M y	177	0.58	178	-1.73
Age training	M y	61.67	1.15	61	1.73
Height	Cm	21.73	5.23	23.3	-1.23

Variables	Measurement unit	Mean	Standard deviation	Median	Torsion coefficient
Weight	Kg	3.33	2.52	3	0.59
Physical variables and tests					
Power of the leg: vertical jump	Cm	50	37.27	30	1.72
Power of the leg: Jump with both feet farther (10) seconds away	Cm	35.67	5.03	35	0.59
Ability: Throwing 3-kg medicine ball	Cm	19.67	1.15	19	1.73
Power of the hand: Forward-based bend and arm stretch 15 S	R	14.67	2.52	15	0.59-
Endurance arms: attachment of arm bend mode for as long as possible	S	23.33	13.58	16	1.72
Endurance Arms: Bend Arms from Slanting to Fatigue	R	34.67	1.53	35	-0.94
Endurance Leg: The partridge on one foot for as far away as possible until fatigue	Cm	76.33	9.71	74	1.02
Speed: Running 60 m	S	9	1	9	0
Flexibility: Bend the torso in front of the bottom of the long seating	Cm	10	6.93	14	-1.73
Agility: Shuttle run 4X10 m	S	13	1	13	0
Respiratory periodic endurance: 1000 meters running	S	3.31	0.23	3.43	-1.72
Achievement level	S	4.25	0.07	4.28	-1.69

Table 1 shows the average arithmetic, standard deviation, intermediate and twist coefficient that the highest value of the coefficient is 1.73 and the lowest value 0. This is a direct indication of the absence of defects in the research community in terms of moderate distributions of the variables in question.

#### Tools and devices used in research:

- 1) Medical balance of weight measurement (kg).
- 2) Rasta meter measuring body height (in centimeters).
- 3) Measuring tape.
- 4) Stop hour.
- 5) Swedish seat.

#### Reference Survey:

The researcher conducted a survey of specialized scientific references that analyzed and identified the physical abilities of middle-distance players. The researcher then conducted a questionnaire form for experts specializing in athletics training.

#### Data collection forms:

The data were collected by the Growth Rate Measurements Registration Form (Chronological Age, Managerial Age, Height, Weight) and Test Registration Form.

#### Selection of assistants:

The researchers selected the assistants after introducing them to the research aspects and objectives in terms of measurement requirements and how to perform physical tests, as well as providing them with special knowledge that

enables them to answer any questions or queries addressed to them.

*The building of the training program for the Sakyo trainings:*

- 1) Availability of security and safety factor and observance of the principle of corrugation of the degree of pregnancy and flexibility of the software and of the selection and arrangement of exercises within the software, in particular
- 2) Defining the objective of the management program, which is to have a positive impact on private physical abilities and the digital level.
- 3) The training program applied 8 training weeks, 4 training modules per week and 90 minutes during the special preparation period, bringing the number of training units to 32.

#### Measurements:

The researchers took tribal measurements of physical tests on Wednesday 14-6-2023 and for the digital level on Thursday 15-6-2023. The dimensional measurements of physical tests were taken on Wednesday 9-8-2023 and for the digital level on Thursday 10-8-2023.

Discussion and analysis of the first hypothesis, "There are statistically significant differences between pre and post metric measurements in the special physical abilities of middle-distance runners and for the benefit of dimensional measurement.

**Table 2.** Statistical differences between the means of the pre- and post-measurements of the physical abilities And the improvement rate and the calculated "T" value n=3.

Experimental variables	Measurement unit	Pre-measurement		Post-measurement		Differences between means	Change percentage %	T value
		Mean	S dev.	Mean	S dev.			
Power of the leg: vertical jump	Cm	50	37.27	66.67	46.46	16.67	25	3.004*
Power of the leg: Jump with both feet farther (10) seconds away	Cm	35.67	5.03	82.33	4.73	46.66	56.67	*14.215
Ability: Throwing 3-kg medicine ball	Cm	19.67	1.15	24.33	0.58	4.66	19.15	14*
Power of the hand: Forward-based bend and arm stretch 15 S	R	14.67	2.52	19.67	3.06	5	25.42	2.887
Endurance arms: attachment of arm bend mode for as long as possible	S	23.33	13.58	44.67	10.79	21.34	47.77	12.095*
Endurance Arms: Bend Arms from Slanting to Fatigue	R	34.67	1.53	44	6.09	9.33	21.2	2.154
Endurance Leg: The partridge on one foot for as far away as possible until fatigue	Cm	76.33	9.71	104.67	24.21	28.34	27.08	2.516
Speed: Running 60 m	S	9	1	8	0.44	-1	12.5	2.474

Experimental variables	Measurement unit	Pre-measurement		Post-measurement		Differences between means	Change percentage %	T value
		Mean	S dev.	Mean	S dev.			
Flexibility: Bend the torso in front of the bottom of the long seating	Cm	10	6.93	11.67	8.39	1.67	14.31	1.89
Agility: Shuttle run 4X10 m	S	13	1	9.64	0.43	-3.36	34.85	9.722*
Respiratory periodic endurance: 1000 meters running	S	3.31	0.23	2.56	0.49	-0.75	29.3	2.463

Statistical significance at 0.05 = 2.92

Table results 2 showed differences between tribal and post measurement between the two averages in physical test results where the vertical jump of stability was 16.67 and the improvement rate was 25%, as for the jump test with both feet for the farthest distance (10) seconds the difference between the two averages was 46.66 and the improvement rate was 56.67% As for the test of throwing a medical ball weighing 3 kg, the differences between the two averages were 4.66 and the improvement rate was 19.15%, The differences between the two averages were 15, and the improvement rate was 5 25.42% As for attachment for as long as possible, the differences between the two averages were 21.34 and the improvement rate was 47.77%, The difference between the two averages was 9.33 and the improvement rate was 21.2%. The difference between the two averages was 28.34 and the improvement rate was 27.08%. As for the 60-metre enemy, the differences between the two averages were 1 and the improvement rate was 12.5%. The difference between the two averages was 1.67 and the improvement rate was 14.31%. As for the 4 × 10 meters shuttle run, the differences between the two averages were 3.36 and the improvement rate was 34.85% As for running 1000 meters, the differences between the two averages were 0.75 and the rate of improvement was 29.3%.

These researchers are due to the impact of the training program followed and applied and its implications on the players. This was evident during the training modules prepared in a manner that takes into account the players' characteristics in the light of the age of the players, as the average age of these players is 21 years and therefore, we consider this category to be highly responsive to training modules, they are highly integrated with these programs, so the age stage of players clearly contributed to the players' improvement between the two tests.

The researchers also consider that the training age of the players is relatively small and not exceeding 3 years, and this age has a clear response to training and different training modules. Therefore, the small training age of the players gives a response to the training, especially Sakyo.

The Sakyo exercises also gave runners the opportunity to pay attention to the speed element, especially since long distances were lacking, and therefore the Sakyo medium-distance exercises had a share of the apparent interest.

The researchers attribute the improvement in the physical abilities under study to the proposed S.A.Q. training program which included constant training on speed and agility; which improved the physical abilities related to the offensive skills in handball. The resistance exercises also had a positive

impact on speed, especially that strong muscles do produce higher speeds [1].

And another study also confirms that the proposed training program using the Sakyo training has led to clear differences in motor capacity variables [11].

Another noted that the Sakyo exercises improved physical and consensual capacities for adaptation to changing situations [6].

The study indicates a positive impact of the pilot program based on the Sacco exercise on the development of some consensual capabilities of the handball junior, with the highest improvement resulting from the Sakyo exercise being in consensual capabilities [12].

Asserts that the Sakyo drills have positively affected the increase of physical abilities in terms of apparent improvement in agility, mobility and speed [9].

Indicates that the Sakyo drills made a clear contribution to the physical variables of speed, motor speed and agility [8].

Physical and consensual abilities are influenced by modern sports training, as Sacco training positively affects the improvement of physical abilities, the improvement of players' consensual abilities, and the ability to speed up motor response [6].

Sakyo training as a training program suited to all sports, including athletics, contributes to improving players' maximum speed, as well as their muscle powers [5].

Sakyo training has a clear and positive impact on improving players' agility and performance levels (3).

The S.A.Q. training resulted in a positive impact in a comprehensive manner on the physical abilities included in the training program. It helped in creating harmony between the neurological system and the signals it sends to the muscles [1].

The researchers also consider that the Sacco drills have obvious effects in enhancing the physical capabilities of all athletes in various different sports, as they have a clear effect on muscle ability as well as the speed and agility of players, increasing both the speed and ability to exert maximum effort, and also include increases in muscle capacity in all multiple movements, and increasing reaction speed.

From the foregoing, the researchers consider that the Sakyo training clearly contributes to improving players' physical abilities.

Discussion and analysis of the second hypothesis, "There are statistically significant differences between pre and post metric measurements in the achievement level of middle-distance runners and for the benefit of dimensional measurement.

**Table 3.** Statistical differences between the means of the pre- and post-measurements of the physical abilities And the improvement rate and the calculated "T" value n=3.

experimental variables	Measurement unit	Pre-measurement		Post-measurement		Differences between the means	Change percentage %	T value
		Mean	Standard dev.	Mean	Standard dev.			
achievement level	S	4.25	0.07	4.14	0.08	-0.11	2.66	5.096*

Statistical significance at 0.05 = 2.92

Table 3 results showed differences between tribal and post-intermediate measurements in achievement level results of 0.11 and 2.66% improvement.

The researchers refer to these differences between the two tests due to the use of similar reference studies and collaboration with experts specializing in the field of special Sakyo training, which helped to develop a structured training program that had an impact as well as knowledge of the problem of special physical abilities of the players of the Palestine Middle Distance Strong Games.

The researchers' experience as coaches, one of whom is a mid- and long-distance team player, and knowledge of the nature of exercises for middle-distance runners, and work to drop such exercises with regard to both speed and agility among the hostilities.

Daily and careful follow-up of the program in the training of middle-distance runners, the presence of the trainer and his guidance during the training, in addition to the guidance given to the aggressors, including rest and adequate sleep, attention to healthy nutrition and the prioritization of these observations.

The researchers are also keen on diversity in the conditions in which the training took place, including what was on the asphalt and the Bible, and the player was moving from training from one training circumstance to another.

The outcome of the current study is consistent with the that Sakyo training is more effective in improving physical abilities and Achievement level, and the study which indicated a positive effect of the combination of speed drills, agility and motor velocity Sakyo on some physical variables and achievement level of 110 hardies riders, as well as the study [7]. that the exercises improved some physical abilities and achievement level [13].

This is confirmed that in changing training methods they must be taken into account when designing training programs. Following the principles of sports training in terms of determining the severity and size of appropriate training, this will undoubtedly show new results reflected on the achievement level of the nature of the game [3].

### 3. Conclusions

There are statistically significant differences between the pre- and post-measurement tests in favor of the post-measurement for the application of the S.A.Q. training strategies. The percentage of the physical abilities of the female handball students showed improvement: the arms ability reached 6.23%, the legs ability (vertical jump) 22.37%, the legs ability (long jumps) 9.27%, speed %8.96, agility 5.16%, Flexibility 38.88%.

There are statistically significant differences between the pre- and post-measurement tests in favor of the post-measurement for the application of the S.A.Q. training strategies. The percentage of the passing skill and jump shots among the female handball students showed improvement: the passing skill improvement percentage reached skill 20.52% and jump shots 28.68%.

### 4. Recommendations

Adopt Sakyo training as a basic training methodology for middle-distance runners.

Speed and agility training should be enhanced for middle-distance runners, both in terms of the size of the appropriate training and in terms of the time period, as it has an impact on the improvement of the achievement level of runners.

Guiding the Palestinian Athletics Federation towards the importance of Sachio training and its use in their training programs.

Undertake further studies and specialized research on Sakyo training and its impact on physical abilities and improve the digital level in different aspects.

### Conflicts of Interest

The authors declare no conflicts of interest he authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

- [1] Alaqra, H. & Alaqra, O. (2023). Effect of (S.A.Q.) Training on Selected Physical Abilities and Performance of Passing Skill and Jump Shots in Handball among Female Students at the Faculty of Physical Education and Sports at Al-Aqsa University. IOSR Journal of Sports and Physical Education, 10 (1): 21-29.
- [2] Alaqra, H. Alkhatib, M & Alabssi, T. (2023). The Impact of Virtual Training Program on Improving the Running Time of the Athletics Runners. Journal of Southwest Jiaotong University, 58 (2): 501-507. DOI:10.35741/issn.0258-2724.58.2.46
- [3] Alaqra, H. Alabssi, T. (2022). The effect of Power training during climbing slopes on the maximum aerobic capacity and the achievement level of the Palestinian Athletics National Team players, Journal of AL-AZHAR University, 23(2): 293-304.
- [4] Alaqra, H & Almallahi, S. (2022). Designing a Proposed Training Program Combining Weight and Flexibility Training and Its Effect on Physical Qualities and Achievement Level of Shot-Put Female Players with F56 Disabilities. Journal of Natural Sciences of Hunan University, 49 (9): 165-175.

- [5] Al-Hawari, Rania and Riyadh, Mohammed and Hafiz, Mohammed. (2020). The impact of proposed Sakyo training modules on some of the physical abilities of the 110 hurdles race among students of the Faculty of Sports Education of Beni Suef University. *Beni Suef Journal of Physical and Mathematical Sciences*, 3 (6): 376-393. DOI: 10.21608/OBSA.2020.130801. MD: 1214655.
- [6] Al-Mutbouly, Mahmoud and Bader, Mohammed and Al-Murshidi, Ahmed. (2023). The impact of Sakyo trainings on the special compatible and physical abilities and performance level of the man's lifting skill of free wrestling originators. *Damietta Journal of Physical and Sports Education*, 1 (1): 97-132.
- [7] Abu alhamd, Obaid and Hassan, Al-Hassan and Sayed, Karim. (2023). Combination training using speed, agility and motor speed affects some physical variables and digital level of 110m barriers riders. *Scientific Journal of Physical Education and Sports Sciences*, 99 (1): 691-707.
- [8] Arjunan, R. (2015). Effect of speed, agility and quickness (S.A.Q.) training on selected physical fitness variables among school soccer players. *International Journal of Research in Humanities, Arts and Literature (IMPACT: IJRHAL)*, 3 (10): 519-580.
- [9] Doganay, M., Bingül, B. M., & Álvarez-García, C. (2020). Effect of core training on speed, quickness and agility in young male football players. *The Journal of Sports Medicine and Physical Fitness*, 60 (9): 1240-1246.
- [10] Fathi, Ahmed. (2017). *The basics of football coaching*. Arab Thought House. Egypt.
- [11] Suleiman, Belaroussi. (2010). The impact of a proposed training program using periodic and circular training methods for the development of certain physical qualities of the 1500 runners, *Journal of Superiority in the Science and Techniques of Physical and Sporting Activities*, 3 (1): 122-133.
- [12] Khalil, Ahmed. (2023). The effect of Sakyo drills on some of the consensual abilities of handball originators. *Scientific Journal of Specialized Physical and Sports Education Sciences*, 14 (2): 321-348. MD: 1391329.
- [13] Qabr, Hamdi. (2021). The impact of Sakyo trainings on some physical abilities and biokinematic variables of the upgrade phase and digital level in the long jump competition. *Scientific Journal of Physical Education and Sports Sciences*, 91 (3): 213-246. MD: 1231380.