The effect of endurance training on improving the digital level of short distance swimmers

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Introduction and research problem:

The first steps of success in any society or any sports activity is to follow the steps of the appropriate scientific research method that aims to raise this society or activity to reach the highest possible levels and achieve the planned goals. Therefore, it has become necessary to use the scientific research method and apply it to the Egyptian sports environment.

Essam Abdel-Khaleq (2005) indicates that sports training as a science is one of the most important means to achieve the highest level of performance and win matches, because of its laws, principles, theories, foundations and principles that enable the successful coach to work on applying those foundations, principles and laws to reach the optimum level, through Targeting modern training tools, means, and methods that are compatible with the requirements of his specialized activity (5 :25)

Hohmonn & lames & Letzeelter (2002) mention that the level of skill performance depends on the player's various motor performance abilities and the extent to which they are related to the skill, which in turn is divided into combinatorial abilities, physical abilities, and mixed abilities, and these abilities are the broad base for access Optimum skill performance (10:55)

"Ali Abdul-Hassan and others" (2012) conclude that muscular endurance exercises also contribute to improving other physical abilities, such as muscular strength and speed of various types, as well as increasing the athlete's efficiency in performing special skills that require performance with high resistance and intensity (6: 17)

The researchers believe that the future outlook for the technical performance of swimming has differed greatly from what it was in the past. Training has developed in recent times significantly, so it came out of the traditional framework of performance and new principles were formed that contributed to the development of performance, that the only way to achieve digital achievement in swimming is not through distance training. Long or different repetitions and intensities, but it requires innovation and modern methods and training methods that work to achieve the best digital level during the competitions.

Through the above, the researchers found that there is a necessity, as far as he knows, to pay attention to improving the endurance level of short-distance swimmers, due to the possibility of improving their digital level, which prompted the researchers to conduct a study that includes identifying the level of improving the digital level of short-distance swimmers through endurance training.

Search Aims:

Recognize the effect of endurance training on improving the digital level of short distance swimmers.

Research hypotheses :

1. There are statistically significant differences between the mean pre and post measurements for the control group at the digital level under discussion in favor of the post measurement.

2. There are statistically significant differences between the averages of the tribal and remote measurements of the experimental group at the digital level under discussion in favor of the dimensional measurement.

3. There are statistically significant differences between the mean of the two dimensional measurements of the control and experimental groups at the digital level under discussion in favor of the dimensional measurement of the experimental group.

Search procedures:
Research Methodology :

The researchers used the experimental approach due to its relevance to the nature of the research, using one of the experimental designs, which is the experimental design, the two-group system, one experimental and the other controlling, by applying (pre-measurement - post-measurement) for both groups.

Research community and sample:

The research community included swimmers in the Medical Professions Club in Minya - for the general stage. The research sample was chosen by the intentional method. The research sample included (24) swimmers, and they were divided (12) swimmers for the experimental group, (12) swimmers for the control group.

The average distribution of the research sample:

To verify the moderation of the distribution of the members of the research sample, the statistical measurements of the total research sample were carried out (12 experimental sample swimmers + 12 control sample swimmers + 10 exploratory sample swimmers) from short distance swimmers, in order to find the skew coefficients for the growth variables (age, height, weight and numerical level before starting to use endurance exercises, and table (1) shows this:

Table (1)

Arithmetic mean, median, standard deviation, and skew coefficient of the research sample in the growth variables: age, height, weight and numerical level tests for the swimmers in question

(n = 34)

Variables	unit	Median	Mediator	s.t.dev	skewness
basic variables					
age	year	23.2	23.1	3.91	0.77
height	cm	175.5	175.3	1.17	2.05
the weight	kgm	75.7	76.0	2.63	0.34
digital level tests					
freestyle test 50m	sec	43.5	43.0	1.09	1.38
backstroke test 50m	sec	50.8	51.0	1.11	0.54
breaststroke test 50m	sec	51.3	51.5	0.98	0.61
Dolphin Swimming Test50 m	sec	47.2	47.0	1.02	0.59
Butcher's test 3 repetitions x 15m freestyle	sec	13.0	12.9	0.77	0.13
freestyle test 25m	sec	23.1	23.5	0.94	1.28
backstroke test 25m	sec	29.3	29.0	1.21	0.74
breaststroke test 25m	sec	31.0	31.3	0.69	1.30
Dolphin Swimming Test25m	sec	25.0	24.8	0.81	0.74

It is clear from Table (1) that the skew coefficients of the sample under investigation in the variables of age, height, weight, training age and numerical level tests for swimmers in the research sample ranged between (0.13: 2.05), meaning that they were limited between (±3), which indicates the moderation of the distribution of the research sample due to the presence of values The skewness within the equilibrium curve.

The equivalence of the two search groups:

The following table shows the results of equivalence between the experimental and control groups in each of the growth variables (age, height, weight) and the numerical level in the short swims under study.

Table (2)

The significance of the differences between the mean scores of the two tribal measurements for the experimental and control groups in the variables (age, height, and weight) and the numerical level

(n1 = n2 = 12)

Variables	unit	experimental group		control group		Statistical Indications	
		M	S.T	M	S.T	T	sig
basic variables							
age	year	23.2	1.53	22.6	1.17	1.052	NOT SIG
height	cm	176.8	3.02	175.7	6.77	0.506	NOT SIG
the weight	kgm	76.8	5.47	76.4	8.13	0.147	NOT SIG
digital level tests							
freestyle test 50m	sec	41.94	3,80	44.15	4.28	1.335	NOT SIG
backstroke test 50m	sec	51.71	2.09	51.16	1.83	0.691	NOT SIG
breaststroke test 50m	sec	51.58	1.65	52.75	2.19	1.468	NOT SIG
Dolphin Swimming Test50 m	sec	46.77	1.16	47.23	2.20	0.642	NOT SIG
Butcher's test 3 repetitions x 15m freestyle	sec	12.61	0.94	12.96	1.21	0.788	NOT SIG
freestyle test 25m	sec	24.50	0.94	23.80	1.89	1.137	NOT SIG
backstroke test 25m	sec	30.10	1.49	29.29	1.43	1.369	NOT SIG
breaststroke test 25m	sec	27.26	1.21	27.27	1.46	0.043	NOT SIG
Dolphin Swimming Test25m	sec	25.26	0.89	25.78	1.05	1.310	NOT SIG

Tabular value (T) in two directions at the degree of freedom (22) and the level of 0.05 = 2.074

It is clear from Table (2) that there are no statistically significant differences between the swimmers of the experimental and control groups in the variables of age, height, weight and training age, as the calculated (t) value is less than the tabular (t) value at the 0.05 level, which indicates the equality of the two research groups in those variables.

Data collection methods:

- **First: Arab and foreign references:**

The researchers reviewed the specialized scientific references and previous studies related to the field of research to benefit from them when conducting this research.

- **Secondly the forms:**
  − Personal data registration form for swimmers prepared by the researcher.
  − Two expert opinion survey forms (on the main themes of the proposed training program) prepared by the researchers.

- **Third: Scientific devices and tools:**

  The following devices and tools were used:

  − Stop Watch.
  − Medical scale for measuring weight.
  − Resist meter for measuring length.
  − Elastic cords.
  − Sandbags.
  − The palms of the hands.
  − Leg kicks.
  − Video camera.
  − Fins.
  − weights.
  − Whistle.
  − Floating tension buoys.
  − Collars.
  − cones.

- **Fourthly, the tests:**

  The researchers used the following tests:

  − freestyle test 50m
  − backstroke test 50m
  − breaststroke test 50m
  − Dolphin Swimming Test50 m

- Butcher's test 3 repetitions x 15m freestyle
- freestyle test 25m
- backstroke test 25m
- breaststroke test 25m
- Dolphin Swimming Test25m

Executive Actions:

Tribal measurements:

Tribal measurements of the research variables were carried out for the two experimental groups in the period from 19/3/2021 to 20/3/2021 in the swimming pool complex at Minya University.

Program implementation:

Implementation of the proposed training program took 10 weeks from 21/3/2021 to 10/6/2021 with 4 units per week, and the duration of the training unit ranged between 90: 150 s.

Dimensional measurement:

After completing the application of the program, the researchers carried out the dimensional measurements of the two experimental groups in the period from 12/6/2021 to 15/6/2021 for digital level tests under the same conditions that were followed in the tribal measurement.

Statistical method used:

To calculate the results of the research, the researchers used the Spss program to calculate some statistical transactions, and the researchers agreed to a significance level at the level (0.05).

Show results:

Presentation of the results of the first hypothesis, which states:

1. There are statistically significant differences between the mean pre and post measurements for the control group at the digital level under discussion in favor of the post measurement.

Table (3)

The significance of the differences between the mean scores of the pre and post measurements of the experimental group at the numerical level in the short swims under study

(n = 12)

Variables	unit	Tribal measurement		telemetry		Statistical Indications	
		M	S.T	M	S.T	T	sig
freestyle test 50m	sec	44.15	4.28	43.05	3.03	2.075	Sig
backstroke test 50m	sec	51.16	1.83	48.26	1.29	4.382	Sig
breaststroke test 50m	sec	52.75	2.19	49.73	1.44	5.556	Sig
Dolphin Swimming Test50 m	sec	47.23	2.20	44.84	1.76	5.840	Sig
Butcher's test 3 repetitions x 15m freestyle	sec	12.96	1.21	11.86	0.95	3.007	Sig
freestyle test 25m	sec	23.80	1.89	22.07	1.93	3.990	Sig
backstroke test 25m	sec	29.29	1.43	27.49	1.11	4.372	Sig
breaststroke test 25m	sec	27.27	1.46	26.20	1.19	4.833	Sig
Dolphin Swimming Test25m	sec	25.78	1.05	24.99	0.75	4.221	sig

Tabular value (T) in one direction at the degree of freedom (11) and the 0.05 level = 1.796

It is evident from Table (3) that there are statistically significant differences between the tribal and remote measurements of the swimmers of the control group at the numerical level in the short swims under discussion, as the calculated (t) value is greater than the tabular (t) value at the 0.05 level.

Presentation of the results of the second hypothesis, which states:

2. There are statistically significant differences between the averages of the tribal and remote measurements of the experimental group at the digital level under discussion in favor of the dimensional measurement.

Table (4)
The significance of the differences between the mean scores of the pre and post measurements of the experimental group at the numerical level in the short swims under study

(n = 12)

Variables	unit	Tribal measurement		telemetry		Statistical Indications	
		M	S.T	M	S.T	T	sig
freestyle test 50m	sec	41.94	3,80	35.37	2.88	4.809	Sig
backstroke test 50m	sec	51.71	2.09	45.39	2.12	5.371	Sig
breaststroke test 50m	sec	51.58	1.65	45.17	1.60	6.002	Sig
Dolphin Swimming Test50 m	sec	46.77	1.16	40.80	1.34	6.375	Sig
Butcher's test 3 repetitions x 15m freestyle	sec	12.61	0.94	10.51	0.69	5.777	Sig
freestyle test 25m	sec	24.50	0.94	20.31	1.37	6.231	Sig
backstroke test 25m	sec	30.10	1.49	25.69	0.94	5.972	Sig
breaststroke test 25m	sec	27.26	1.21	24.48	1.08	4.908	Sig
Dolphin Swimming Test25m	sec	25.26	0.89	22.37	0.88	4.766	sig

Tabular value (T) in one direction at the degree of freedom (11) and the 0.05 level = 1.796

It is evident from Table (4) that there are statistically significant differences between the tribal and remote measurements of the experimental group swimmers at the numerical level in the short swims under discussion, as the calculated (t) value is greater than the tabular (t) value at the 0.05 level.

Presentation of the results of the third hypothesis, which states:

3. There are statistically significant differences between the mean of the two dimensional measurements of the control and experimental groups at the digital level under discussion in favor of the dimensional measurement of the experimental group.

Table (5)

The significance of the differences between the mean scores of the two dimensional measurements for the experimental and control groups at the numerical level in the short swims under study

$(n1 = n2 = 12)$

Variables	unit	experimental group		control group		Statistical Indications	
		M	S.T	M	S.T	T	sig
freestyle test 50m	sec	35.37	2.88	43.05	3.03	6.366	Sig
backstroke test 50m	sec	45.39	2.12	48.26	1.29	4.001	Sig
breaststroke test 50m	sec	45.17	1.60	49.73	1.44	7.341	Sig
Dolphin Swimming Test50 m	sec	40.80	1.34	44.84	1.76	6.320	Sig
Butcher's test 3 repetitions x 15m freestyle	sec	10.51	0.69	11.86	0.95	4.030	Sig
freestyle test 25m	sec	20.31	1.37	22.07	1.93	2.578	Sig
backstroke test 25m	sec	25.69	0.94	27.49	1.11	4.305	Sig
breaststroke test 25m	sec	24.48	1.08	26.20	1.19	3.719	Sig
Dolphin Swimming Test25m	sec	22.37	0.88	24.99	0.75	7.848	sig

Tabular value (T) in two directions at the degree of freedom (22) and the level of 0.05 = 2.074

It is evident from Table (5) that there are statistically significant differences between the two dimensional measurements of the swimmers of the experimental and control groups at the numerical level in the short swims under study, as the calculated (t) value is greater than the tabular (t) value at the 0.05 level.

Interpretation and discussion of the results.

It is evident from Table (3) that there are statistically significant differences between the mean of the tribal and remote measurements of the control group under consideration in the digital level tests of the short distance swimmers under discussion in favor of the post-measurement.

The researchers attribute this result to the fact that the planning of the traditional training program followed by short-distance swimmers contributed to improving their digital level in the tests under consideration.

In this regard**, Hassan El-Sayed (2006)** mentions that planning sports training is the main factor for determining and directing the course of purposeful sports action, and it is the basic rule and the foundation upon which the process of improving the training process in the sports field is built. The trainer to implement the training content in accordance with his objectives, as well as with the special principles that determine the appropriate form for organizing the training load during a specific period of time to determine realistic, clear, accurate and sequential objectives in order (4: 349)

These results are in agreement with the studies of **Mustafa Ali (2021)(8), Asaad Ibrahim (2021)(2), Ahmed Sayed (2020)(1), Mennat Allah Muhammad (2020)(9), Baha Eddin Mahmoud (2020). (3), UZUN (2013) (14), James, A., Green, (2012) (11)**, where those studies demonstrated the existence of statistically significant differences between the mean of the pre and post measurements of the control group and in favor of the post measurement as a result of The use of traditional training programs under their research.

It is evident from Table (4) that there are statistically significant differences between the mean of the tribal and remote measurements of the experimental group in the digital level tests of the short-distance swimmers under discussion in favor of the post-measurement.

The researchers attribute these differences to the effectiveness of endurance training under consideration in improving the digital level of short-distance swimmers, which effectively contributed to increasing the

physical efficiency of the research sample, which helped improve the performance of short-distance swimmers under discussion in the digital level tests.

In this regard, "**Ali Abdul-Hassan et al.**" **(2012) (6)** explains that endurance has collected the basic physical characteristics of sports training, as the athlete, under certain conditions, performs the exercises for this component to obtain the body elements that are useful for sports specificity by combining them together under the name of a component. One is that the relationship between endurance, speed and strength generates complex physical abilities that work in the player to perform the highest sports movements for a number of repetitions for a certain period of time to resist fatigue and reach the highest possible, and work is in the form of explosive movements, and the results of this relationship or this integrated combination is called endurance" (6:4)

Michael Doyle (2003) also adds that endurance is an essential goal for difficult competitions. The ability to perform difficult movements is after doing many of those exercises, and the important thing in this ability is that it requires the correct combination of endurance of strength and endurance of speed during training processes. 12:5).

THOMAS R. BAECHLE (2012) that endurance is a complex and important physical characteristic in water sports, and this is represented in the player's ability to generate explosive muscle contractions for the longest possible period according to the nature and type of sports activity and this appears in swimming through the ability of the swimmer to face water resistance by a large number of Arm pulls with a greater number of leg strikes for large periods, whether during training or competitions (13:17)

These results are in agreement with the studies of **Mustafa Ali (2021)(8), Asaad Ibrahim (2021)(2), Ahmed Sayed (2020)(1), Mennat Allah Muhammad (2020)(9), Baha Eddin Mahmoud (2020). (3), UZUN (2013) (14), James, A., Green, (2012) (11),** where those studies proved the existence of statistically significant differences between the mean of the pre and post measurements of the experimental group and in favor of the post measurement as a result of The use of endurance

exercises and training programs that included endurance exercises under their research.

It is evident from Table (5) that there are statistically significant differences between the two dimensional measurements of the swimmers of the experimental and control groups at the numerical level in the short swims under study in favor of the experimental group.

The researchers attribute this result to the effectiveness of endurance training that was planned according to a scientific method that takes into account the individual differences between swimmers and takes into account the gradual load and training from easy to difficult and from simple to complex, which contributed to improving the digital level of short-distance swimmers compared to the traditional training program that was implemented on The control group is under investigation.

In this regard, **Muhammad Ibrahim (2015)** concluded that the development of endurance capacity effectively contributes to improving the digital level of the 100-meter freestyle runners. The results of his study indicated that there are statistically significant differences between the two dimensional measurements of the swimmers of the experimental and control groups at the digital level in the short swims under study. In favor of the experimental group of 100-meter freestyle runners, and this is consistent with the current study (7:59)

These results are in agreement with the studies of **Mustafa Ali (2021) (8), Asaad Ibrahim (2021) (2), Ahmed Sayed (2020) (1), Mennat Allah Muhammad (2020) (9), Bahaa Eddin Mahmoud (2020) (3), UZUN (2013) (14), James, A., Green, (2012) (11),** where those studies proved the existence of statistically significant differences between the mean of the two dimensional measurements of the experimental control group and in favor of the experimental group As a result of using endurance training and training programs that included endurance training under their research.

Conclusions:

In light of the aim of the research and the presentation of the results that were reached, the researchers concluded the following:

1. The endurance exercises under study had a positive and effective effect on improving the numerical level of the short distance swimmers under study.
2. There are statistically significant differences between the mean of the two measurements, tribal and remote, for the control group under discussion in the digital level tests of the short distance swimmers under research in favor of the post measurement.
3. There are statistically significant differences between the mean of the pre and post measurements of the experimental group in the digital level tests of the short distance swimmers under discussion in favor of the post measurement.
4. There are statistically significant differences between the two post measurements of the swimmers of the experimental and control groups at the numerical level in the short swims under study in favor of the experimental group.

Recommendations:

In light of the research results, the researchers recommend the following:

1. The necessity of using endurance training and integrating it with training programs for short-distance swimmers in the public stage to develop their digital level.
2. The necessity of using endurance training and integrating it with training programs for short distance swimmers at all age levels to develop their digital level.
3. Conducting more studies that contain endurance exercises for other sports.

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The effect of endurance training on improving the digital level of short distance swimmers

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The research aims to identify the effect of endurance training on improving the digital level of short-distance swimmers, and the research hypotheses were as follows: There are statistically significant differences between the mean pre and post measurements of the control group in the digital level under discussion in favor of the post measurement, there are statistically significant differences between The average pre and post measurement of the experimental group at the digital level under discussion in favor of the post measurement, There are statistically significant differences between the mean of the two dimensional measurements of the control and experimental groups at the digital level under study in favor of the dimensional measurement of the experimental group. Number (24) swimmers, The most important results were as follows: There are statistically significant differences between the means of the tribal and remote measurements of the control group at the digital level under research in favor of the dimensional measurement, and there are statistically significant differences between the means of the tribal and remote measurements of the experimental group at the digital level under research in favor of the dimensional measurement.

key words :

(endurance capacity - digital level - speed swimming)