The impact of using TRX training on some of the physical and digital variables of dolphin swimmers

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Introduction and Research Problem:

The scientific and technological progress WHICH witnessed by the world today in all areas and activities of life drives the workers in the field of sports to search for everything new and modern in this area,

Where the era we live in the enormous development of the potential used in the field of sports, and racing all countries to benefit from these possibilities, which include various sports equipment and devices,

must be adapted to the player's interest in order to encourage him to do more activity and interact in training. Koprince (2009) points out that training with modern equipment is one of the essentials of physical preparation,

Which has become a necessary requirement in the various sports activities that can be carried out whether these activities are individual or collective as they are effective methods that have an impact on the development of special abilities in (TRX), which refers to a fitness training curriculum that uses a system of ropes and ligaments called suspending exercises that allow the player to work against his full weight by training (51:13)

TRX is a fitness training method that has been evident in the last few years and focuses on using the entire body weight in training rather than using the equipment in the fitness halls.

Pagan, Nicholas (2005) emphasizes that suspension training is a revolution in the world of sports training. It is an advanced form of resistance training, which aims to develop muscle strength in all its forms without the use of weight or other forms of resistance, but only uses body weight as a natural resistance to performance. . (110: 17)

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Weijun (2011) notes that attachment training is symbolized by the TRX symbol, which means total body resistance exercise, which is suitable for beginners and high-caliber. Graduation can be achieved by changing the body's position relative to the attachment point. (14: 140)

Many authors nots that training exercises are simple exercises and not easy, there is a big difference between simple and easy, and this is evident in the fact that it is a simple exercise and can be graduated in the intensity of the weak intensity of the maximum and is aimed at improving balance،

Most trainers consider dolphin swimming to be one of the most difficult to swim, as it is difficult to fit all parts of the body, especially when moving out of the water, especially when taking it in. Both arms, head and part of the shoulders are raised out of the water. (69:10)

Mohtak Ibrahim (2002) and Muhammad Ali Al-Qatt (2000) agree that the dolphin swim requires a high technical performance as well as more muscular strength, experience and familiarity with the water medium than the other swimmers, and usually comes to learn after learning two swimmers or (74: 4) (65: 5) This is a prelude to learning.

Many authots (٢٣)Note that some water sports trainers are interested in the development of the special physical requirements along with the development of the skill side.

The researcher noted the frequent use of swimming instructors on the frequency of performance may improve the muscle memory of the swimmers, which may lead to improved motor abilities,

But may result in a feeling bored swimmers to repeat the daily performance where The focus is on the muscle groups in the eye The importance of diversity in the use of forms and patterns of training used, including attachment exercises and the technical form of swimming dolphins, is dependent on the horizontal position,

Such as crawling on the abdomen, and then the particle becomes the upward and downward movement of the legs and the movement of the

two feet and the movement of the wave

This is what the training may have done with the TRX device. This study led the researcher to investigate the effect of the use of TRX on some of the physical and digital variables of dolphin swimmers

Research goal

The aim of the research is to identify the effect of the use of TRX training on some of the physical and digital variables of dolphin swimmers

Research hypotheses

1- There are statistically significant differences between the averages of pre and post measurements at the level of some physical variables and the level of skill performance in dolphin swimming and in favor of the experimental research group.

2- There are statistically significant differences between the averages of pre and post measurements at the level of some physical variables and the level of skill performance in dolphin swimming and in favor of the control group.

3- There are statistically significant differences between the two dimensions of the two measure in the experimental and control research groups at the level of some physical variables and the level of skill performance in the dolphin swimming and in favor of the experimental research group.

Research plan and procedures

Research Methodology

The researcher used the experimental method in the method of pre measurement of the two groups, one experimental and the other an officer in order to suit the nature of the research and to achieve its objectives and mandates.

The research sample

The sample of the research included the swimmers under the age of (14) years in **Tanta Governorate** and registered with the **Egyptian Swimming Federation** during the 2016/2017 sports season.

The researcher chose the sample by a deliberate method of (28) swimmers at **Tanta Sports Club**, which the researcher divided into two equal and equal groups, (10) swimmers, in addition to (8) swimmers to conduct the exploratory experiment of the

research has been found homogeneity and equivalence between the research sample as in Table (1), (2)

Table (1)

Homogeneity of the research sample in growth rates, physical variables and skill level In the dolphin swimming pool at the research sample N = (28)

Serial	Variables	measuring unit	Average	standard deviation	Mediator	Torsion coefficient
1	Height	Cm	135.85	1.63	135.50	0.52
2	Weight	Kg	45.32	1.11	45.00	0.32
3	Age	Year	13.10	0.95	13.00	0.41
4	Training age	Year	4.12	0.15	4.10	0.32
5	Strength of leg muscles	Kg	42.65	1.32	42.10	0.52
6	Strength of back muscles	kg	48.62	1.52	48.50	0.14
7	The muscular capacity of the legs	M	1.65	0.62	1.60	0.32
8	Muscle strength of two arms	M	4.62	0.51	4.60	0.85
9	Flexibility of the spine	Cm	46.22	1.69	46.20	0.32
10	Flexibility of hip joint	Cm	128.62	2.18	128.10	0.11
11	Skill Performance (25) Dolphin	Second	48.66	1.66	48.50	0.52

It is clear from Table (1) that all the values of the arithmetic mean exceed the values of the standard deviations, and that all the values of the torsion coefficients were limited to (+/-3) indicating the homogeneity of the sample and free of the irregular distribution defects.- the skilled performance of dolphin

swimming) in the sample **Equal search groups** members in question.

Table (2)

The significance of statistical differences between the control and experimental groups in each of the growth rates And physical variables and skillful performance of dolphin swimming for the sample under study (N = 1 n = 10)

Variables		measuring unit	experimental group (N = 10)		Control group (N = 10)		Calculated value (t)	Statistical significance
			M	E	M	E		
Height		Cm	134.20	1.32	133.69	1.11	0.65	Non significant
Weight		Kg	45.22	1.32	45.19	0.98	0.52	Non significant
Age		Year	13.12	0.98	13.10	0.32	0.21	Non significant
Training age		Year	4.11	0.52	4.12	0.21	0.47	Non significant
Physical attributes	Strength of leg muscles	Cm	42.60	1.11	42.65	0.98	0.62	Non significant
	Strength of back muscles	Kg	48.21	0.52	48.25	0.32	0.14	Non significant
	The muscular capacity of the two legs	M	1.60	0.041	1.62	0.52	0.65	Non significant
	The muscular capacity of the arms	M	4.61	0.69	4.65	0.21	0.87	Non significant
	Flexibility of the spine	Cm	46.20	0.54	46.25	0.47	0.25	Non significant
	Flexibility of hip joint	Cm	125.62	2.88	125.60	0.11	0.47	Non significant
Skill Performance (25) Dolphin		Second	45.32	1.11	45.33	0.32	0.21	Non significant

*Tabular value (T) at the level of significance (0.05) = 1.725

Table (2) shows that there are no statistically significant differences between the control and experimental

research groups in both the growth rates and the physical variables and the skill level of dolphin swimming for the sample in question.

All calculated values are greater than the tabular value at the level (0.05) indicating their equivalence in those variables.

Data collection tools
First: Tools and tools used in research:
Tools and devices used:

The researcher used the following tools and devices to measure search variables:

 •**Medical balance calibrated** – to measure the body weight to the nearest kg
 •**Rastamer** –
 to measure the height of the body from the ground to the nearest poison
 •**Chain dynamometer**
to measure the strength of the muscles of the legs and back.
 •Swiss balls
 •Cones
 •Registration form and sample measurements.
 •Approximate hour (0.01) w.
 •Three (3) "T.R.X" devices
 • Swimming pool.
Tests used in research:
Physical and skill tests:

1-String dynamometer to measure the strength of the muscles of the two legs.
2 -String dynamometer to measure the strength of the back muscles.
3 -Test the push of a medical ball to the farthest distance to measure the muscular capacity of the arms.
4 -Wide jump test of stability to measure the muscular capacity of the two men.
5 -Flexibility test of the spine.
6 -Flex hip test.
7 -Test time (25) meters dolphin to measure the digital level of the nearest (0.01) w

Training program:

The training program under study was developed by following method of training in the period and in view of the characteristics of the developmental stage of this stage.

1-The proposed exercises should match and achieve the objectives set.
2-Warrming should include stretching exercises for muscle groups used in training.
3-Taking into consideration the characteristics of the age group and its physical and functional abilities.

4-Appropriate and available tools for the program and training content.

5-The gradient is easy to hard in light of the rated training load and the curvature method in the training

6- Maintaining general health requirements for physical exercise and safety and security factors (Continuity Sequence Integration Equivalence)

7- Keeping the order of the exercises on different parts of the body.

Limitations of the proposed training program:

1-Duration of the program (8) weeks.

2-Number of weekly training modules (3) training modules.

3-The total number of training units (24) training units.

Table (3)

Significance of differences between pre - and post - measurement at some level Physical variables and skill level I have the experimental search group N = 10

Variables	measuring unit	Pre measurement		Post measurement		Difference between the two averages	Improvement rate	T value	Level of significance
		S	±E	S	±E				
Strength of leg muscles	Cm	٤٢.٦٠	١.١١	٥١.٣٢	٠.٥٢	٨.٧٢	٢٠.٤٦%	٣.٥٢	Significance
Strength of back muscles	Kg	٤٨.٢١	٠.٥٢	٥٣.١١	٠.٣٢	٤.٩٠	١٠.١٦%	٣.٢١	Significance
The muscular capacity of the legs	M	١.٦٠	٠.٠٤١	١.٩٥	٠.٥٨	٠.٣٥	٢١.٨٧%	٣.٥٢	Significance
Muscle strength of two arms	M	٤.٦١	٠.٦٩	٥.٢٢	٠.٢١	٠.٦١	١٣.٢٣%	٣.٥٨	Significance
Flexibility of the spine	Kg	٤٦.٢٠	٠.٥٤	٥٣.٢١	٠.٤٧	٧.٠١	١٥.١٧%	٣.١٤	
Flexibility of hip joint	Kg	١٢٥.٦٢	٢.٨٨	١٣٣.٢٠	٠.٦٢	٧.٥٨	٦.٠٣%	٣.٥٢	Significance
Skill Performance (25) Dolphin	Second	٤٥.٣٢	١.١١	٤٠.٣٢	٠.٨٥	٥.٠٠	١٢.٤٠%	٣.٦٩	Significance

The value of "T" is the table at a level of significance (0.05) = 1.52

Table (3) shows that there are significant differences between the pre-measurement and the post-measurement in

all physical tests and the level of skilled performance of the dolphin in question. The value of (t) was greater than the tabular value at the significance level (0.05) Physical and skillful experimental group research.

Table (4)

Significance of differences between pre - and post - measurement at some level Physical variables and skill level The control group has control N = 10

Variables	measuring unit	Pre measurement		Post measurement		Difference between the two averages	Improvement rate	T value	Level of significance
		S	±E	S	±E				
Strength of leg muscles	Cm	42.65	0.98	45.21	0.98	2.56	6.00%	2.88	Significance
Strength of back muscles	Kg	48.25	0.32	49.88	0.047	1.63	3.37%	2.61	Significance
The muscular capacity of the legs	M	1.62	0.52	1.75	0.32	0.13	8.02%	2.45	Significance
Muscle strength of two arms	M	4.65	0.21	4.90	0.552	0.25	5.37%	2.63	Significance
Flexibility of the spine	Kg	46.25	0.47	48.10	0.62	1.85	4.00%	2.45	Significance
Flexibility of hip joint	Kg	125.60	0.11	128.11	0.47	2.51	1.99%	2.01	Significance
Skill Performance (25) Dolphin	Second	45.33	0.32	43.32	0.85	2.01	4.63%	2.11	Significance

The value of "T" is the table at a level of significance (0.05) = 1.52

Table (4) shows that there are significant differences between the pre-measurement and post-measurement in all physical tests and the level of skill performance of the dolphins in question.

The calculated value (t) was greater than the tabular value at the significance level (0.05) Physical and technical skills of the control group.

Table (5)
Significance of differences between the two dimensions of the experimental group And control at the level of some physical variables And skill level N 1 = n 2 = 10

Variables	measuring unit	The experimental group		Control group		T value	Level of significance
		S	±E	S	±E		
Strength of leg muscles	Cm	51.32	0.52	45.21	0.98	3.52	Significance
Strength of back muscles	Kg	53.11	0.32	49.88	0.047	3.85	Significance
The muscular capacity of the legs	M	1.95	0.58	1.75	0.32	3.14	Significance
Muscle strength of two arms	M	5.22	0.21	4.90	0.552	3.52	Significance
Flexibility of the spine	Kg	53.21	0.47	48.10	0.62	3.65	Significance
Flexibility of hip joint	Kg	133.20	0.62	128.11	0.47	3.58	Significance
Skill Performance (25) Dolphin	Second	40.32	0.85	43.32	0.85	3.47	Significance

The value of "T" in the table at a level of significance (0.05) = 1.725

Table (5) shows that there are significant differences between the two dimensions in the experimental and control groups in all the physical and skill tests under study.

The calculated value (t) was greater than the tabular value at the significance level (0.05) Skillful and in favor of experimental research group.

Discussion of results

Table (3) shows statistically significant differences between the mean and post measurements of the experimental group in physical and digital variables tests for

dolphin swimming in favor of telemetry.

The calculated value (t) is greater than the tabular value at the significance level (0.05) The program is proposed using a TRX attachment device and is used with a swimmer experimental group.

In this regard, Burns (2007) states that TRX attachment training is one of the forms of functional resistance training aimed at directing the resulting power in the direction of performance and leading to multi-level and integrated movements (7: 7)

Danielle Dannelly, et al. (2011) indicates that attachment exercises increase the area of the muscle segment and the diameter of the thick muscle fibers in the trained muscle by focusing on the muscles of the center, thus increasing muscle fiber and thus increasing the amount of protein in the muscle, which leads to the acquisition of the muscle tone (150: 8)

Mustafa Al-Jabali (2000) reported that many researchers and specialists in the field of sports agree that there is a strong correlation between physical abilities and skill level.

The athlete can not master skills (55: 6) (51: 3) of the type of sports activity he specializes in if he lacks the physical abilities of this type of activity.

The researcher attributed these changes and developments in the physical and technical requirements and therefore the digital level of dolphin culture to the good planning of the training program of attachment to the TRX and the regulation of training loads in a scientific manner suitable for the age and training of the research sample to the use of attachment exercises to develop muscle strength of all kinds,

Graduated during the application of the program by training various muscle groups, especially the muscles of the arms and legs and the focus of the researcher on the muscle groups working during the skill of initiation, which led to the improvement of variables in

question and thus have achieved a first hypothesis which states that there are statistically significant differences between the averages of pre measurements and dimensionality in the level of some physical variables and the level of skill performance in the pool and in favor of Adolph experimental research group.

Table (4) shows statistically significant differences between mean and post measurements of the control group in physical and digital variables tests of dolphin swimmers for the benefit of telemetry.

The calculated value of (t) is greater than the tabular value at 0.05 level. Regularity of the research sample in the presence of physical and skill training and the program followed and subject to them.

This is consistent with Essam Abdel-Khaliq's (2003) view of the need to match the muscular contractions of the selected special exercises to the extent possible with that incident during the

performance of the skill itself, whether of the type or severity of the contractions. (112: 2)

This is confirmed by Muhammad Ali al-Qatt (2000) that skill training alone is not sufficient to improve this skill and to obtain fruitful results. In addition to developing skill, it is necessary to develop the motor abilities of the skill itself. (95: 4)

Mustafa Kadhim, Abul-Ela Abdel-Fattah, Osama Rateb (1998) agrees that the relationship between the basic skills of a sport and its different physical requirements (general, special) is a close relationship that must be taken into consideration when preparing the players. (48: 6), and in the event that the player has a high level of physical fitness،

Thus, the second hypothesis was achieved, which states that there are statistically significant differences between the averages of pre and post measurements at the level of some physical variables and the level of skilled

performance in dolphin swimming and in favor of the control group.

Table (5) shows statistically significant differences between mean distance measurements in experimental and control groups in tests of physical and skill variables in favor of the empirical research group. The calculated value (t) is greater than the tabular value at the significance level (0.05) Use TRX attachment device drills used with the experimental group swimmers.

The researcher believes that the reason for improving the physical and skill of swimmers is that the TRX device used in the application of the program achieved high moral results and should be used in the preparation period for all sports to raise the level of physical and skill.

Beijing Pagan (2005) notes that suspension training is suitable for all individuals at different levels of training and aims to improve the relationship between muscles and the nervous system by converting the increase in strength gained from one movement to another. Therefore, locomotor training exercises are necessary and important such as muscle training Individuality through movement. (110: 17)

Thus, the third hypothesis was achieved, which states that – There are statistically significant differences between the two dimensions of the two dimensions in the experimental and control groups at the level of some physical variables and the level of skill performance in the dolphin swim and for the experimental research group.

1-The attachment exercises using TRX have had a positive effect on improving the physical capabilities of dolphin swimmers.

2 -The suspension training using TRX has had a positive effect on the improvement of the technical variables of the dolphins.

3 -Suspension training using the TRX has had a better impact than the program on improving the special physical

abilities and skill performance of Dolphin swimmers.

4- The use of the TRX suspense training device because of its positive effect in improving the physical variables in physical preparation programs in swimming.

5 -Use the TRX suspense training device instead of the weight training exercises for beginners to eliminate the injuries that may occur to those age group of weight training.

6- Conduct further studies on the impact of TRX training on other physical abilities in different sports.

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