

**The effect of a training program using TRX and Vopr on the level of technical performance On the parallel apparatus of gymnasts**  
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**Introduction to the research:**

Physical fitness is of great importance in various sports, and its importance lies in the fact that it forms the basis for the skillful performance of the players and provides them with energy sources for performance, as it is subject to scientific and educational principles and foundations that may effectively contribute to the appropriate numbers to perform the duties required of the athlete, leading to achieving advanced positions in activities. different.

And "Issam El-Din Abdel-Khaleq" (2005) indicates that the training programs within the training process have taken a form, structure and organization that is consistent with the new development in the methods and means used in the training process . (32 : 3)

There are many modern methods and means by which the coach can design an effective training program that can improve sports performance, namely TRX & Vopr fitness exercises, through which it is possible to develop the elements of general fitness and special sports skills where they can be integrated into sports programs for different sports such as: Self-defense, tennis, swimming, football, basketball, gymnastics, and other sports(10:46) . TRX training is based on the use of body weight to develop strength,

endurance, flexibility, balance and strength endurance, and can be used by everyone regardless of age or gender. It relies on a tool that enables its practitioners to perform hundreds of exercises to reach any fitness goal(27) . And "Sukhivan Singhlan lahart, Paul" (2015 AD) mentions that recently appeared exercises known as "Total Body Resistance Exercise" and abbreviated TRX, and appeared in various forms hundreds of years ago in the combat units of the Roman army, and also entered into the well-known ancient Chinese acrobatic movements Currently in gymnastics, and its use evolved in the 19th century to be used in exploratory trips and mountain climbing in combat training, and explains recently the leap in the physical and skill level of gymnasts to benefit from the experiences of previous generations in using ropes for training with body weight resistance, and total body resistance training or TRX attachment training arose The one we know today by Randy Hatrick, after graduating from the University of Southern California in 1987 AD, he spent 14 years as a commander of the Navy Seal Forces, and during his career he was looking for a way to maintain physical fitness due to the large number of joint military operations and the diversity of its

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places without the need for traditional tools that he carries with him.

Second, the research problem

Through the researcher's practice of gymnastics as a former player and current coach, and his follow-up to many local and international junior championships in previous years, he noticed the decline in the career level of gymnastics juniors physically and their skill level was affected by that decline in many tournaments, which called the researcher to experiment with a systematic training method codified with special controls and a variety of methods. The goals are in order to develop the physical ability of the youngsters. The researcher also noticed a deficiency in the exercises for the two sides (upper-lower) of the body, whether exercises related to the upper limb only, or exercises related to the lower limb only, or exercises related to the involvement of the upper and lower extremities together, which prompted the researcher to design a training program that contains I have many different exercises using both ends of the upper and lower body individually or together, in order to know its impact on the level of performance of gymnastics skills, and this is what aroused the researcher's interest to study the effect of a training program using TRX and Vopr exercises on the level of performance of some skills on the parallel apparatus for gymnasts (under 10 years old)

#### **Research Objective:**

The research aims to design a proposed program using TRX & Vopr

exercises on the performance level of some skills of the parallel bars in gymnastics to identify:

1- The level of some physical variables for gymnasts

2- On improving the level of performance of some skills of the parallel bars in gymnastics

Fourth: Research hypotheses.

1- There are statistically significant differences between the standard mean (pre- and post-test) of the research sample in the development of some special physical variables for gymnastics juniors in favor of the post-measurement

2- There are statistically significant differences between the standard mean (pre- and post-test) of the experimental research sample in improving the level of skill performance of the parallel device in favor of the post-measurement

#### **Search terms:**

1- TRX (Total Body Resistance Exercise): It is a exercises based on the use of body weight against gravity through a hanging tool consisting of two nylon straps that do not have any percentage of rubber that can be adjusted in length and have handles and foot straps, used to develop all elements of fitness. Its exercises include the whole body, and its exercise is suitable for all categories of males and females, healthy people, people with special needs, athletes and non-athletes(16 :10) .

2- Vopr Tool: It is an advanced tool that is a tube made of high quality rubber and has three handles to accommodate many different exercises

and can be used for all ages for its weights

1- Various, whose weight ranges from 4-26 kg, and is used to improve the elements of physical fitness, and it is the ideal tool for using and directing the body's energy, which is a combination of lifting, pulling, pushing, rotations, throwing and traction movements(17 :10) .

Search procedures

#### Research Methodology:

The researcher used the experimental method to suit the nature of this research. In this study, the

researcher relied on the measurement design (pre- and post-test) for one experimental group.

Second: The research community and sample:

The research community included (20 players) in the stage of under 10 years, and they were deliberately chosen from among the gymnasts in Heliopolis Club registered with the Egyptian Gymnastics Federation, and they were divided into (8) players to be the sample of the exploratory study (12) players to be the sample of the basic study

**Table (1)**

ن = 20 التوصيف الإحصائي لقياسات المتغيرات الأساسية

Torsional coefficient	Standard Deviation	Intermediate	Average	Unit of measurement	Variables	Sample
1.294	131.5	3.271	132.5	Year	Age	The total research sample (experimental and exploratory)
1.394	29	3.060	29.833	cm	Length	
0.315	9	0.447	9.000	Kg	the weight	
0.995	4	0.376	4.083	Year	Training age	

It is clear from Table (1) that all the values of the skew coefficients calculated for the variables (age - height - weight - training age) for the main research sample ranged between (2.88: 0.05), and all of these values are limited to between  $\square$  3, which indicates the homogeneity of individuals Research sample in those variables.

Third: Means and tools for data collection:

In collecting data and information related to the variables under research, which work to achieve the goal of the research, the researcher relied on the following tools:

A- Data form for the research sample:

The researcher designed a data form for the research sample (pilot - experimental) that includes (name - age - height - weight - training age). Attachment(1)

Reference survey: The researcher, within the limits of his findings, reviewed scientific literature and reference studies, Arab and foreign, and connected to the international information network in order to identify:

Physical Exams Attachment(7)

Skill tests attached(8)

Determining the TRX & Vipr exercises through which the level of physical

performance and skill can be developed so that its dynamic structure is similar or can be modified to match the direction of the movement path of gymnastics.

Fourth: The survey:

The exploratory study from the period from 3/11/2018 to 15/11/2018. The study aimed to understand the assistants and players of the concepts of TRX & Vipr training and the fundamental differences between training methods and elements of physical fitness in the training method, as well as to determine the general

objectives of the program and the date of implementation of the program under discussion

Calculation of scientific coefficients for tests:

The researcher chose an exploratory sample from the research community consisting of (6) players from outside the basic research sample and from within the research community and conducted on them the tests and measurements under study, and the validity and reliability of the tests used were calculated as follows:  
veracity of tests

**Table(2)**

**Significance of the differences between low-level players and high-level players  
To calculate the differentiation validity of the tests under study, n1 = 4 n2 = 4**

t value	Low level		High level		measruing unit	the test	variable
	deviation	mean	deviation	mean			
*6.639	1.472	9.167	1.505	14.333	kg	grip strength	Maximum strength
*2.821	2.787	25.333	5.020	34.500	kg	Leg strength	
*3.245	2.733	24.833	3.188	32.333	kg	back strength	
*3.956	2.137	15.833	3.371	18.833	cm	vertical jump	Ability
*3.919	4.131	152.667	9.077	165.50	cm	wide jump	
*3.807	0.68	1.852	0.302	2.003	meter	push medicine ball	
*5.301	2.483	30.833	2.529	38.000	number	Sitting from the prone	endurance force
*4.081	2.160	12.333	5.845	18.833	number	Tensile up rate	
*4.939	1.862	13.333	2.137	18.166	number	Leaning prone from standing	

Tabular t-value at the 0.05 level = 2.571

It is clear from Table (2) that there are statistically significant

differences between the distinct and non-distinguished group in the special

physical abilities and skill in question, where the calculated “z” value is greater than the tabular “z” value at the level of significance of 0.05, which

indicates the validity of the tests under research.

**stability coefficient:**

**Table(3)**

**Correlation coefficient between the first and second application of the study sample Reconnaissance in the tests under consideration n = 8**

correlation coefficient	The second application		The first application		measruing unit	the test	variable
	deviation	mean	deviation	mean			
*0.829	0.894	14.500	1.505	14.333	kg	grip strength	Maximum strength
*0.959	5.250	31.667	5.020	34.500	kg	Leg strength	
*0.890	2.695	29.833	3.188	32.333	kg	back strength	
*0.832	1.941	21.166	3.371	18.833	cm	vertical jump	Ability
*0.831	2.401	160.833	9.077	165.50	cm	wide jump	
*0.907	0.149	2.123	0.302	2.003	meter	push medicine ball	
*0.909	3.614	37.333	2.529	38.000	number	Sitting from the prone	endurance force
*0.943	6.511	19.000	5.845	18.833	number	Tensile up rate	
*0.923	2.338	18.667	2.137	18.166	number	Leaning prone from standing	

\*Value (t) at the level of significance 0.05 = 0.811

It is evident from Table (3) that there is a direct statistically significant correlation at the level of significance 0.05 between the first and second application of the exploratory study sample in the tests under discussion,

which indicates the stability of the tests.

The homogeneity of the (basic) research sample in the physical and skill variables under study:

**Table(4)**  
**The arithmetic mean, median, standard deviation, and skewness coefficient of the research sample in the variables under investigation n = 12**

<b>Torsional coefficient</b>	<b>Standard Deviation</b>	<b>Intermediate</b>	<b>Average</b>	<b>Unit of measurement</b>	<b>the exams</b>	<b>Variables</b>
0.73	1.37	14.00	14.333	Kg	grip strength	Maximum strength
1.07	1.86	34.020	34.500	Kg	Leg strength	
0.29	3.44	32.000	32.333	Kg	back strength	
0.18	5.42	18.000	18.833	Cm	vertical jump	Ability
1.02-	1.97	165.00	165.50	Cm	wide jump	
0.41	2.17	2.302	2.003	Meter	push medicine ball	
0.69	3.47	38.000	38.000	Number	Sitting from the prone	endurance force
1.14	5.28	18.000	18.833	Number	Tensile up rate	
0.00	0.91	18.000	18.166	Number	Leaning prone from standing	
1.629	0.73679	5.00	5.458	Degree	Stability in the pivot position An "L"-shaped angle	skills
1.691-	0.83381	5.000	5.166	Degree	Stability in the "V" shape	
1.449	0.41404	5.000	5.500	Degree	Handstand in the shape of the letter "V"	

It is clear from Table (4) that the values of the skewness coefficients in the variables under investigation were limited to ( $\pm 3$ ), which indicates the moderation of the sample distribution, and the homogeneity of the research sample members in these variables.

Fifth: Preparation of the program:  
Attachment(6)

The main objective of the program:

To identify the effect of a program using TRX & Vipr exercises on the level of performance of some physical variables and skills for gymnasts

Training program criteria:

- Flexibility and adaptability of the program.

- Taking into account the principles of training when developing the program.

- That the program fits with the objectives set.

- Appropriateness of the training program and its contents to the age group of the selected sample.

- Regularly practicing the exercises set in the program in order to achieve the desired benefit.

- Taking into account that the performance of skills and training in the form of gymnastics exercises.

Specifications of the training program:

**Table(5)**  
**Training program variables**

Period	Program Variables	No
Three months (8) weeks	program duration	1.
Special preparation period and before competitions	Implementation period	2.
(5)units per week	Number of training units per week	3.
%10	warm-up ratio	4.
%25	Proportion of skill part	5.
%60	TRX & Vipr . Training Ratio	6.
%5	Final part ratio	7.
(40)alone	The number of program units	8.
40days	Number of training days	9.
(240 BC) = (60 hours).	The number of training hours	10.
60minutes	training unit time	11.
(%85) high load	General intensity of the program	12.
)Interval high and low intensity - repetitive.(	The training methods used	13.

The contents of the program:

The main elements included in the training unit in the training program are:

.1Introductory part (warm-up period):

The warm-up aims to activate the vital physiological systems necessary for the requirements of the body's activity.

.2The main part (the basic training period) includes:

- Skill Training: Skills in Sanda Sports

- TRX & Vopr exercises: for gymnastics.

.3Closing part (cooling-off period): return to normal physiological state

Sixth: Basic Study:

Tribal measurements

-The researcher applied the tribal measurements of the players, determining the level of physical performance and skill level, and determining the maximum limits of the exercises used in order to legalize the training load and apply the principle of individuality in training. From 16/11/2018

Program application:

- The researcher implemented the training program from 17/11/2018 to

7/2/2019 for a period of 12 weeks, with three training units per week.

Dimensional measurements:

- The researcher applied the dimensional measurements of the research sample in the period from 8/2/2019.

Seventh: Statistical treatments:

The researcher used the SPSS program in the appropriate statistical treatments for the research:

-average.

-Mediator.

-Deviation.

-skewness

Mann Whitney test.

-rate of improvement

Presentation and discussion of the results:

**Table(6)**

**The significance of the differences between the mean of the two measurements (pre- and post-test) for the group Measurements of physical abilities and skill level n = 12**

t value	post-measurement		pre-measurement		Unit of measurement	the exams	Variables
	deviation	mean	deviation	mean			
*12.5	1.505	22.666	1.505	14.333	kg	Leg strength	Ability
*46.1	4.457	62.833	5.020	34.500	kg	back strength	
*31.62	2.823	45.667	3.188	32.333	cm	vertical jump	
*20.31	3.656	30.167	3.371	18.833	cm	wide jump	endurance force
*11.95	10.553	178.833	9.077	165.50	meter	push medicine ball	
*9.41	0.304	2.315	0.302	2.003	number	Sitting from the prone	

**Follow Table(6)**  
**The significance of the differences between the mean of the two measurements**  
**(pre- and post-test) for the group Measurements of physical abilities and skill**  
**level n = 12**

t value	post-measurement		pre-measurement		Unit of measurement kg	the exams grip strength	Variables Maximum strength
	deviation	mean	deviation	mean			
*7.56	5.913	56.166	2.529	38.000	number	Tensile up rate	skills
*20.24	6.229	31.000	5.845	18.833	number	Leaning prone from standing	
*22.21	2.943	30.666	2.137	18.166	Degree	Stability in the pivot position An "L"-shaped angle	
*13.74	0.258	8.083	0.485	5.458	Degree	Stability in the "V" shape	Variables
*13.01	0.306	8.125	0.683	5.166	Degree	Handstand in the shape of the letter "V"	
*13.84	0.466	8.417	0.758	5.500	Unit of measurement	the exams	

The researcher attributed the statistically significant differences and improvement rates that occurred in the research sample in the measurements of (physical abilities) under study to: The positive impact of the proposed training program using TRX & Vpr exercises applied to the research sample, the training program contained a set of different skill physical

exercises similar to the motor path of the nature of the performance of the motor skills under study, and aims to develop some special physical abilities as well as improve the level of skill performance for the junior gymnastics. Focusing on the working muscles during the motor performance of the skillful performances.

Following the scientific method in legalizing the loads in terms of (intensity - size - density) and taking into account the gradation of the training load and the individual differences of the loads between the players in addition to the training methods used in proportion to the period of time.

The accuracy of choosing the TRX & Vopr exercises applied within the proposed training program in the physical preparation part with appropriate intensities, repetitions and intervals, as these exercises were developed based on qualitative and technical analysis of the skill performances, and performed in the same kinetic paths of the selected skill performances under discussion.

Taking into account the gradation in the training loads when developing training units similar to the conditions of the competition.

The proposed training program takes into account the individual differences between the juniors, which helps to quickly absorb the technical skills with a high degree of accuracy and mastery and leads to an improvement in the level of skill performance of the judo junior without a drop in the level of strength or speed of performance.

The effect of the content of the skill preparation part that includes a set of odd and pair skills (fixed and kinesthetic) in order to improve skill performance.

Khayriya Al-Sukari and Muhammad Bariqa' in 2001 AD stated that it is possible to achieve maximum

development from training if the exercises take the form and nature of the skillful performance of the type of activity being practiced(35 : 2) .

Essam El-Din Ahmed Abdel-Khaleq 2005 CE, and Mahrous Mohamed Qandil 2018, indicate that the more these exercises are similar in their dynamic construction of the movement to be learned, the more learning and improved athletic performance. (236: 240(45 :10) (

Vopr exercises are based on an important basic idea that all of its movements have a functional purpose, where lengthening and shortening lead in multiple directions so that they form the functional basis for them(33) .

And Jordi Martínez (2010) adds that Vopr exercises are different in terms of their complex training (exercises using more than one muscle at the same time) and work to improve aerobic work, improve flexibility and balance, and develop the effectiveness of body muscles in addition to burning calories through strength and movement training that can be performed by the individual at multiple levels and to practice a set of complex movements that can be performed(10 : 15) .

José Luis Maté-Muñoz 2016 AD mentions that TRX attachment exercises work on the muscle cross-sectional area and the diameter of the thick muscle fiber in the trained muscle by focusing on the center muscles, so the muscle fiber grows, thus increasing the amount of protein in the muscles, which leads to gaining muscle tone . (150 :14)

These results are in agreement with the results of the study of Nidal Faisal Abu Al-Filat 2013 (8), Dalia Radwan Labib 2014 (6), Maryam Mustafa Muhammad 2015 (7), Samah Muhammad Abdel-Moaty 2016 (9), Mahrous Muhammad Qandil et al. 2016 (10). However, TRX & Vpr exercises have a positive effect in developing and improving the measurements of (physical abilities) under study significantly, as their results indicated the existence of statistically significant differences between the pre and post measurements in favor of the post measurement.

Conclusions and recommendations

Abstracts:

-1The proposed applied training program has a significant effect on (the level of special physical abilities)

-2The proposed applied training program has a significant impact on (the skill level).

-3The proposed training program is a step towards functional training on physical variables, because it contains integrated exercises at the skill level

Recommendations:

-1It is necessary to pay attention to the use of TRX & Vpr exercises to improve the level of performance (physical, skills) and apply them to other skills.

-2Conducting studies using TRX & Vpr training on players of different age groups (boys - girls).

-3Conducting studies using TRX & Vpr training on other sports.

-4Taking the results of the study into consideration when designing training programs for TRX & Vpr exercises.

the reviewer

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