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Exercises using the varimax device and the impact on the abilities and technical performance of the Arab jump on the jumping table device for juniors

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ABSTRACT

Varimax is an effective tool in sports training, contributing to the development of basic physical skills such as explosive power, speed, balance, and agility, which are essential elements of gymnastics. Bringing the player to a high level of performance is a necessary step to prepare him for competitions, which highlights the importance of research in employing modern devices to enhance the physical requirements necessary to implement the Arab jump skill on the jumping table device, which contributes to improving the performance of players and achieving advanced levels in this sport.

Research problem: Most training centers in the governorates suffer from a lack of modern and advanced equipment that helps coaches develop the level of players, as they still rely on traditional means and the coach's individual capabilities in finding training solutions. Hence, the researcher sought to use the VertiMax device as an innovative solution to develop physical abilities, which may have a direct positive impact on the performance of the Arab jump skill among junior gymnastics.

Research Objective: The research aims to study the impact of exercises using the VertiMax device in developing physical abilities and improving the performance of the Arab jump skill on the jumping table among juniors in gymnastics.

As for the conclusions: The results showed that the use of modern devices such as VertiMax contributes significantly to reducing the time and effort required to develop performance, which facilitates the training process for both coaches and players, and enhances the effectiveness of training programs

1- Definition of research:

1-1 Introduction to the research and its importance:

Today, sport has become a benchmark for the progress of nations, and gymnastics is one of the Olympic Games with a large share of medals. When following the development of this sport, it is possible to observe the great progress in motor performance, which was not a mere coincidence, but rather the result of artistic development that included various aspects of life. Researchers and specialists in this sport have been interested in benefiting from theoretical sciences, such as the science of sports training, which made the application of the principles and methods of sports training necessary in building training curricula for each sports game, including gymnastics, which is characterized by special physical requirements and high-level technical performance. In addition, gymnastics is practiced by very young age groups compared to other sports, which gives it extra privacy.

Gymnastics is one of the individual sports that has received wide attention in developed countries due to the fun it provides, whether for practitioners or spectators, especially because of the variety of devices used in it. One of the main factors contributing to the development of this sport is assistive training aids, as they play a key role in accelerating the learning and training process if used correctly. These methods also contribute to simplifying motor performance and improving the physical and skill levels of players, as reaching the optimal form of performance is a key goal in learning and training.

VertiMax is an effective device in athletic training, developing basic physical requirements such as explosive ability, speed, balance, and agility, which are compatible with most, if not all, gymnastics skills. Preparing a player to reach a high level of performance is an essential step to prepare them for sports competitions.

As for the jumping table, it is one of the distinctive devices in artistic gymnastics, as it differs in terms of training and evaluation compared to other devices. This tool contains movement groups defined by the law, each with several distinct movements. The player's performance is evaluated based on a specific jump bearing a certain number, and he must perform one jump, except for qualifying for the jump table finals, where the player must perform two jumps from different kinetic groups and a second flight that is different, whether in direction (front or rear) or in terms of body position (curved or curved). The difference is also evident in rotational movements, where jumps must involve at least half a lap or a rotational motion with simple flight.

The importance of this research lies in the selection of modern tools and devices that contribute positively to the development of the physical requirements necessary to implement the Arabian jumping skill on the jumping table device, which enhances the performance of players and helps them achieve advanced levels in this sport.

1.2 Research problem:

Through the researcher's review of some junior gymnastics championships through their attendance and follow-up of some of the results of Committee E noted that there are large discounts in the performance of the Arab jumping skill on the jumping table device for junior players and after dialogue with specialists and coaches that weakness in the level of some physical requirements in addition to that most of the specialized and training centers in the governorates lack the presence of modern and advanced equipment that helps coaches to upgrade the level of their players, most of which depend on traditional means and the capabilities of the coach in finding Solutions to develop their players, so the researcher sought to find solutions to the problem using the device (Vertimax) in the development of these physical requirements, which when developed can put a positive impact in a direct way in the performance of the Arab jumping skill on the device of the jumping table for juniors.

1-3 Research Objectives:

- Preparing exercises using the VertiMax device to develop physical requirements and improve the performance of the Arabian jump skill on the jumping table device for junior gymnasts.
- Identify the effect of training using the VertiMax device in developing physical abilities and performing the Arabic jump skill on the jumping table among gymnastics juniors.

1-4 Research Hypotheses:

- There are statistically significant differences between the pre-test and the post-test in some physical abilities and the performance of the Arab jump skill on the jumping table, in favor of the post-test.

1.5 Research Areas:

1-5-1 Human field: Maysan Junior Gymnastics Training Center players during the 2024 sports season.

1.5.2 Spatial area: The gymnastics hall is special for Maysan Training Center.

1.5.3 Time Range: From (24/ 5/2024) to (27/7/2024).

2- Research Methodology and Field Procedures:

2-1 Research Methodology:

The researcher used the experimental approach by designing one group for pre- and post-tests in order to suit the nature of the problem to be solved.

2.2 Research community and sample:

The research community represented the emerging gymnastics players who train in the specialized training center in Maysan, and the number of (6) players aged (10-12) years, and the sample that was selected in a deliberate way represented a percentage of (100%) because they are the only ones who apply the skill and in order to achieve homogeneity between the members of the research sample and to avoid the impact of factors that may affect the results of the experiment in terms of individual differences in the sample, where the researcher conducted the homogeneity process of the sample in some specifications of the sample that may have Effect on the experimental variable (length, mass, age) using the law of torsion coefficient as in Table (1) and through the value of the torsion coefficient of all research variables less than □ 3, meaning that the sample is distributed naturally..

Table (1)

Shows the homogeneity of the members of the research sample in the specifications of the sample

Torsion coefficient	Standard deviation	Arithmetic mean	Unit of measurement	Variables	t
0,14	4,76	130.66	poison	Length	1
0,66	1,16	31,16	kg	Mass	2
0,00	0,89	11,00	year	lifetime	3

2-3 Means, devices and tools used in research:

2.3.1 Means of data collection:

1− Observation.

2− Arab and foreign sources.

3- Questionnaire form to determine tests and expert form

4- Tests and metrics.

5- International Telecommunication Network (Internet).

2.3.2 Devices and tools:

1. Tape for measuring length.
2. Medical scale.
3. One video camera with its accessories.
4. 1 photography camera.
5. Sponge mats varied in thickness and size number (5).
6. The device of the jumping table .
7. Electronic stopwatch (2)
8. 1 chair
9. Dell Laptop Computer with 1 Accessories
10. Whistle number (2)
11. Legal parallel device number 1.
12. Vertimax device.
13. 1 jumping table
14. 1 glove

The Verti Max device and its importance in sports training:

The VertiMax device is one of the latest devices used in sports training, as it is characterized by its unique design that helps develop the physical performance and skill of athletes in various sports.

Machine Specifications:

The device consists of an iron table of square or rectangular shape, covered with flexible plastic and contains eight ports dedicated to rubber ropes, which are characterized by their length and flexibility, as they are wrapped and passed through rollers that allow the athlete freedom of movement as much as possible during the performance of exercises and these ropes are fixed to the athlete through special belts used to secure each part of the body to be trained, which ensures their stability without affecting the athlete's comfort or hinderment during exercises, The device can control the level of pressure and resistance of

each rubber rope separately, using a special handle that helps adjust the intensity of the exercise according to the level of the athlete and his training needs.

The importance of the device in sports training:

The VertiMax device is one of the most important sports training systems in the world, as it contributes to the development of many skills and physical abilities that athletes need in various events and sports. Among the most prominent aspects developed by the device:

1. Strength and muscular capacity.
2. Speed and cruising speed.
3. Power combined with speed to improve motor performance.
4. Stretching (physical endurance) to enhance integrated athletic performance.
5. Improve jumping and agility skills, making it ideal for gymnastics, athletics, football, and more.

Thanks to these features, the VertiMax device is widely used in advanced training centers, helping athletes achieve significant physical and motor gains that enhance their level in sports competitions.

As shown in Figure 1

Figure (1) illustrates the device

2-4 - Field research procedures:

2.4.1 Identification of tests for physical requirements:

After determining the physical requirements, the researcher selected a set of tests, and then a questionnaire form was organized for these tests as shown in the statement of their opinions on the validity of these tests and their suitability for the research sample and was presented to those with experience and specialization in sports training and gymnastics and after collecting and unloading the forms were adopted tests that got a larger percentage.

2.4.2 Description of the tests used in the research:

First: Testing the explosive ability of the arms **(throwing the medical ball 2 kg with the hands)** [1]

Objective: Measure the explosive power of the arms and shoulders.

Used tools: flat area, small rope, chair, medicine ball (2 kg), tape measure, marking marks.

Performance Description:

1. The laboratory sits on the chair with the medicine ball carried by hands above the head and the trunk adjacent to the back of the chair (back).

2. Fixing the tester with a belt from the player's chest and holding from behind by a tight means for the purpose of preventing the tester from moving forward while throwing the ball with the hands.

Test conditions: The tester is given an independent attempt at the beginning of the test as a performance exercise, and the tester is given two consecutive attempts, when the laboratory shakes or moves during the throw, the result is not counted and another attempt is given instead.

Management to test:

- Recorder: Calls on testers and records the results.
- Referee: Installs the cord and observes performance and measurement.

[1] Muhammad Hassan Allawi and Muhammad Nasr al-Din Radwan: (1994) quoted by Ismail Ibrahim Muhammad: the effect of special exercises according to some biomechanical variables to teach the skill of diamedov on the parallel device, PhD thesis, College of Physical Education, University of Baghdad, 2005, pp. 75-76.

- Controller: Sets where the ball falls and measures.

Calculation of grades: calculated for each attempt is the distance between the front edge of the chair and the point of falling of the ball on the ground hand close to (+ 15 cm), and the degree of the laboratory is the degree of the best attempt of the two attempts.

Second: Vertical jump test of stability Sargent ().

Purpose of the test: Measuring the explosive power of the two legs in the vertical jump upwards.

Necessary tools:

Fifth: Skill test:

The researcher conducted skill tests for the members of the research sample, as the tests included the performance of the members of the research sample of the Arab jump skill on the jumping table device was photographed and the dimensions of the camera (fixing the height of the camera (1.50) m and after the camera (3) m from the device, which was filmed to ensure the appearance of the player clearly) and presented it to the referees for evaluation by a jury consisting of four referees * To evaluate the technical performance of the members of the research sample by watching the television show to test the skills before and after, and the arbitration form includes the degrees of the referees and that the value of each of them (10 degrees) was written off the highest and lowest degree and the intermediate degrees are collected and divided by (2) to extract the final degree of the player.

2.5 Exploratory Experiment:

The researcher conducted their exploratory experiment on a sample consisting of (3) players from the same research sample from Maysan Training Center and with the help of the assistant team after explaining the tests to them and how to register, and the experiment took place on (24/5/2024) on Friday at four o'clock in the afternoon Physical tests and special exercises:

The purpose and objective of the exploratory experiment were:

- Ensure the safety and validity of the devices and tools that are supposed to be used in the research

- Preparing and equipping the place of the experiment.

- Training the staff of assistants on how to conduct tests and measurements, as the researcher needed (3) assistants to complete the tests.

- Fixing the height of the camera (1.50) m and the distance of the camera (3) m from the device, which was filmed to ensure the appearance of the player clearly.

- Identify the most important obstacles that may face the researcher when implementing tests.

- Know the time taken when carrying out tests.

2.6 Pre-tests:

The researcher conducted pre-tests for the physical requirements of the research sample as well as the technical performance on the jumping table on Thursday (30/5/2024), and the researcher also installed the conditions related to the tests such as place, time and method of implementation for the purpose of achieving the same conditions or as close to them as possible for the post-tests.

2.7 Preparation and implementation of special exercises

Within the framework of developing some physical requirements and the skill of the Arab jump among junior gymnasts, the researcher prepared special exercises that contribute to achieving the objectives of the special (physical) preparation stage for junior athletes at the Specialized Center - Maysan. The first training unit was implemented on Sunday, 2/6/2024 after conducting the pre-tests, according to a well-studied training plan aimed at improving the physical and skill performance of the sample.

Training Plan Details:

1- Preparation of exercises:

- The researcher designed specialized exercises after seeking the opinions of experts in the field of gymnastics.

- The trainings focused on developing the physical requirements of young players aged 10-12 years.

- The exercises included exercises for explosive ability and distinctive speed, which are crucial elements in improving motor performance in gymnastics.

2- Training Objectives: Developing the explosive ability and distinctive speed power of both legs and arms, which contributes to improving the motor performance of the Arab jump skill.

3- Duration of the trainings:

- Workouts lasted (8 weeks).
- (3 training units per week) were applied on Sunday, Tuesday, Thursday.
- The total time for each training unit ranged between 17-35 minutes, taking into account the age stage, training age, and physical abilities of the research sample.

4- Details of the training sessions:

- The total number of training units reached (24) units.
- A clear goal has been set for each training module.
- The ripple ratio (2-1) for each month was adopted to ensure gradation and adaptation to training loads.
- Direct supervision was followed up by the researcher, while the exercises were carried out by the instructor.
- The exercises were applied during the main section of the module.
- The researcher relied on interval and repetitive training methods, within an intensity ranging between (75-100%).
- Training began in the special preparation period, to ensure that the required physical adaptations were achieved before entering the competition.

Thanks to this systematic training, these exercises are expected to contribute to the development of the motor and physical performance of young players, which will reflect positively on their implementation of the Arab jump skill on the jumping table device.

2-8Post-tests:

After the end of the period of applying the special exercises within the training units, the researcher re-applied the physical and skill tests to the research sample, on Saturday, 27/7/2024, with the aim of measuring the extent of development in

physical requirements and the performance of the forward jump skill on the jumping table device.

2.9 Statistical methods:

The data was processed by computer using statistical exercises (SPSS24)

3.1 Presentation and analysis of test results (pre-post) for physical requirements:

Table 2

Shows arithmetic means, standard deviations and the value of (**(** T Value **Sig** and the significance level of physical tests For the research sample

Significance	Sig	T	Post-Test		audition Tribal		Unit of measurement	Statistical Features / Physical abilities	t
			(±p)	Going to	(±p)	Going to			
Moral	0.004	6.12	1.00	2.40	1.00	1.90	M	Explosive power of the arms	1
Moral	0.001	8.00	2.08	25.66	1.00	15.00	M	The explosive power of the legs	2
Moral	0.008	4.89	1.00	9.00	1.00	5.00	number	Speed power of the arms	3
Moral	0.003	6.32	1.52	23.00	1.00	17.00	number	The power characteristic of the speed of the legs	4

There are significant differences between the pre-post-test and in favor of the post-aptitude test increased in order, which indicates that the exercises developed using the Verti-max device.

3-2 Presentation and analysis of the results of the test (pre-post) for the skill of the Arab jump on the jumping table device:

Table 3

Values of the differences of the test (pre-post) for the skill of the Arab jump on the jumping table device

Significance	Sig	T	Post-Test		audition Tribal		Unit of measurement	Statistical Features / Physical abilities	t
			(±p)	Going to	(±p)	Going to			
Moral	0.002	5.937	0.753	7.83	0.894	5.00	degree	Arabian jump on the jumping table device	1

3-3 Discuss the results of physical requirements and the skill of the Arab jump on the jumping table device:

Opinions agree that the device (Verti-max) based on the use of rubber ropes that provide conditions for the trainee for various parts of the body in terms of upper and lower limbs and remains his first goal is to develop physical requirements of various kinds and according to the times of training, and this may affect the development of requirements and skill as it turned out in this study, the basis of work is the use of rubber ropes, which have proven many studies effective in developing the player's capabilities and performance.

In terms of its impact on physical requirements, including the strength characteristic of the speed of the arms and vertical jumping, the researcher attributes to the nature of the exercises designed and their specificity for each part and their times that suit the requirements, their repetition, intensity and different loads.

Verti-max has proven to be effective as a training method for improving vertical jumping because of the possibility of placing ropes in directions that allow movement similar to movement[2].

The researcher used various forms in her exercises to develop the strength of the legs, including the ropes tied in the hip area and jumping with both legs

[2] – Rhea M., Peterson MD, Lunt Kt, Aylon FN (2008). The effectiveness of resisted jump training on the VertiMax in high school athletes. (Journal of Strength and Conditioning Research 22, 3), p733.

or with a leg and taking or what was tied on each leg, and some of them used the arms to tie the rubber ropes to them in order to give greater resistance to movement and greater intensity and this has led to positive results in the development of rapid strength of the arms, that resistance training with rubber ropes may lead to a positive change in the functional components of the neuromuscular system Such as muscle strength and endurance, accordingly, what may be more important is the presence of an appropriate training incentive that can lead to neuromuscular adaptation, i.e. employing the specificity of training in a direction that serves movement [(3)] and therefore if we want to improve body strength or performance, the programs must include exercises commensurate with the body's response to them in terms of time, intensity, repetition, diversity and level of the trainee, and that the reason for the lack of development of some requirements may be attributed to The researcher to the time period of training or the number of units and exercises for that, although the researcher took into account the period of training subject time sufficient to make changes to the performance of the players in proportion to the results of the study below, some studies stipulated that the time required to make developments in strength at a level that appears statistically using the (Verti-max) must be more than (6) weeks, and in other studies the results showed its development within (4) weeks, because this period is sufficient in the development of the level of the athlete and enhances neuromuscular adaptation [(4)].

As for skill, the studies evaluated the effect of training directed at different characteristics of strength abilities on the quality of the selected gymnastics movements, and the results showed that to achieve a high technical level, emphasis must be placed on increasing the strength characteristics and ability to resist the entire body, and performance can be improved not only by

[3]– Deschenes MR, WJ Kraemer. (2002). Performance and physiologic adaptations to resistance training. American. (Journal of Medicine and Physical Rehabilitation 81, Suppl), p15.

[4]– McClenton LS, Brown LE, Coburn JW, Kersey RD (2008). The effect of short-term VertiMax vs. depth jump training on vertical jump performance. (Journal of Strength and Conditioning Research 22, 2), p324.

increasing absolute strength, but also by mastering the specific force characteristic corresponding to a particular movement element[5].

Such an age stage of the sample coaches find difficulties in strength training for them in terms of the use of weights or movements in which the arms need to carry body weight, which the player may suffer from because of the ratio of the strength of the arms to body weight and sometimes up to the stage of injury, and on the basis of that must find training means and tools to ensure an increase in strength gradually and according to the requirements of performance without risks to the joints or muscles of the player, and the researcher believes that rubber ropes within the device (Verti-max) is a safe way to develop the strength of the player at this stage, training with rubber ropes is safe for young age stages and plays an important role in growth and maturity during these years Moreover, these exercises reduce the likelihood of injuries and improves motor skill and facilitates weight control, the explosive muscle force is any ability to generate muscle work with the least time and the rate of its production is the basis for gymnastics movements [(6).]

4- (Conclusions and recommendations):

4.1 Conclusions:

- Training with VertiMax has shown a positive and tangible impact in improving the Arabian jump skill, as well as developing physical requirements.
- The use of modern devices such as VertiMax has been shown to reduce the time and effort required to develop performance, making it easier for coaches and players to train.
- When the exercises are applied thoughtfully with VertiMax, it significantly improves motor performance, enhancing the level of the Arabian jump on the jumping table device.

4.2 Recommendations:

[5]– Tilgan OE. (2013). The effects of trampoline training on jump, leg strength, static and dynamic balance of boys. (Sci Gymn J. 5, 2), p24.

[6]– Malena R.M. (2006). Weight training in youth–growth, maturation, and safety: an evidence–based review. (Clin. J. Sport Med. 16), p485.

- Inclusion of the VertiMax device in training programs for junior gymnastics, due to its effective muscle stimulation and safe performance.
- Designing training programs based on rubber resistance to develop physical and skill abilities, taking into account the individual differences between the players.
- Increasing attention to modern training methods within specialized gymnastics centers, to ensure improved performance and reduce injuries.
- Conduct further studies on the effect of assistive devices on various gymnastics skills, to expand the range of benefits that can be achieved through these means
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Tilgan OE. (2013). The effects of trampoline training on jump, leg strength, static and dynamic balance of boys. (Sci Gymn J. 5, 2), p24.

Sample Exercises

First	Week	Develop physical ability and technical performance				Goal
17.5D	Main section time	1	Training Module	75%		Intensity
Total exercise time	Performance time	Raha tha		volume		Exercise Code
		Between totals	Between repetitions	Totals	Iteration	
4.28	17,33 s	60	52	2	2	Standing inside the device, the player performs jumping to the top as possible with the ropes tied around the waist
4.28	17,33 s	60	52	2	2	The player runs a distance of 7 m with ropes around the thighs and waist
3.37	14.66 s	60	42	2	2	Running forward and then the player snatches (jump) on the glove using the ropes around the waist
3.37	14.66 s	60	42	2	2	Jump forward with both feet using ropes around the waist