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The effect of resistance ropes (TRX) exercises in developing some physical abilities and basic skills for football goalkeepers

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Abstract

The aim of the research is to identify the effect of resistance ropes exercises (TRX) in developing some physical abilities and basic skills of football goalkeepers. The researcher relied on the experimental approach to the nature of solving the research problem. The research sample was chosen intentionally, which is the specialized school for goalkeepers, numbering (18) goalkeepers. They were divided into two groups (control) and (experimental) by lottery, with (7) goalkeepers for each group. (4) Goalkeepers were excluded for the exploratory experiment. The measurement tool for the research was a set of physical and skill tests. The exercises were applied during the training units for the experimental group only and in the main section. The researcher concluded through this study that TRX exercises have a good effect in developing focus, agility and flexibility in the experimental group of football goalkeepers. The most important recommendations were to include TRX training within the training units for all other players as well as other training categories.

Keywords: Resistance ropes exercises (TRX), basic skills for football goalkeepers

Introduction

Physical education is the link between The educational perspective and the scientific perspective, as educators classify it through education, sports psychology and sports management, while scientists classify it through anatomy, physiology, sports medicine and biomechanics, as sports education has occupied a prestigious position among different societies in the progress of civilization and has become an indication of the extent of progress and the advancement of the scientific, intellectual and economic level of all societies, and the training method for competition is one of the important aspects that have a positive and comprehensive impact on preparation and upbringing on advanced and modern scientific foundations. Modern methods and exercises played an important role in developing the capabilities of football players in general and goalkeepers in particular, as they help to develop quick individual solutions for goalkeepers, as many cases require quick solutions and high focus of attention in order to develop appropriate solutions for the cases that occur in the match, so it is necessary to focus on performance and its accuracy in order to obtain a good position that helps in defending the goal in a distinguished manner. Resistance ropes exercises (TRX) are considered one of the modern methods that have clearly contributed to developing the individual capabilities of players due to their importance in developing physical abilities such as strength, flexibility, hard work and focus of attention. Hence, the importance of research in preparing exercises using resistance ropes (TRX) and knowing their effect in developing some physical abilities and basic skills among football goalkeepers.

Research Problem

The introduction of modern training methods and means has become necessary to keep pace with the development taking place in the developed countries of the world. Through the researcher's experience as a former player and current professional coach in addition to his job as a lecturer in the College of Physical Education and Sports Sciences, University of Maysan, the researcher decided to know the effect of (TRX) exercises on some physical abilities and basic skills of goalkeepers in football by asking the following question: Is there an effect of resistance ropes (TRX) exercises on some physical abilities and basic skills of goalkeepers in football?

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Research objectives

1. Preparing resistance rope exercises (TRX) to develop some physical abilities and basic skills for football goalkeepers
2. Identifying the effect of resistance rope exercises (TRX) to develop some physical abilities and basic skills for football goalkeepers

Research hypothesis

1. There is a positive effect of resistance rope exercises (TRX) in developing some physical abilities and basic skills for football goalkeepers
2. There is an advantage for the experimental group for resistance rope exercises (TRX) in developing some physical abilities and basic skills for football goalkeepers

Research areas

1. **Human field:** Specialized school for goalkeepers in Maysan Governorate.
2. **Spatial field:** Dijlah Sports Club Stadium
3. **Time field:** The period from (10/11/2023) to (1/2/2024).

Defining research terms

TRX exercises ^[1]

Deepening exercises that use body weight against gravity to build strength, agility, coordination and flexibility and to develop bone capacity, agility and strength endurance, and depend on Perform abdominal, back and pelvic floor muscles using a variety of exercises that can be used for all, regardless

of age or gender, and in a variety of ways. They can also be modified according to individual differences.

Research methodology and field procedures

Research methodology

The researcher adopted the experimental research method because it is compatible with solving the problem to be researched and because it is one of the important means of reaching reliable knowledge. The researcher used the design of the two equal experimental and control groups, as the experimental method is one of the "most sufficient means of reaching reliable knowledge" ^[1].

The research sample

It is that part that represents the original research community on which the researcher conducts his entire work. A number of those selected for the research sample were chosen intentionally, namely the specialized school for goalkeepers, numbering ^[18] goalkeepers, and they were divided into two groups (control) and (experimental) by lottery, with ^[4] goalkeepers for each group, and ^[4] goalkeepers were excluded for the exploratory experiment (and in order to attribute the differences to the experimental factor, the experimental and control groups must be completely equivalent in all circumstances except for the experimental variable that affects the experimental group). The researcher conducted equivalence on the individuals of the two groups in Table No. (1) Which shows the equivalence.

Means of collecting information and devices and tools used in the research:

Table 1: Shows the statistical parameters (arithmetic mean, standard deviation, calculated (t) value and significance of the differences between the experimental and control groups in the pre-tests

Statistical transactions Test name	Unit of measure	Experimental group		Control group		Calculated (T) value	Perhaps value	Significance
		S	A	S	A			
Attention concentration	Number	7.143	1.345	6.919	1.155	0.335	0.744	Not significant
Agility	Sec.	12.084	1.176	12.336	1.011	0.429	0.676	Not significant
Flexibility	cm	5.143	0.690	4.857	0.981	0.775	0.454	Not significant

Degree of freedom (n-2) (14-2=12) and significance level (0.05)

Tools used in the research

(Interview, observation, questionnaire, test)

Devices used in the research:

1. Laptop computer type (Dell) Pentium (4).
2. Laser printer type 2900 Canon.
3. Stopwatch type (Sony)
4. Plastic cones (indicators) number (20)
5. Balls number (8)
6. Multiple rubber ropes
7. Whistle.

Field research procedures

Identifying tests

The most important thing the researcher needs is to choose or develop multiple tests to measure some variables related to the phenomenon to be measured. Accordingly, the researcher prepared a form to choose the appropriate tests for the physical abilities and basic skills under study. The form was presented to a group of specialists in the field of tests and measurement ^[5]. After collecting and unpacking the forms, the tests that achieved an agreement rate of (70%) or more were chosen. Table (2) shows this.

Table 2: Shows the percentages of experts' selection of the tests under study

Variables	Tests	Repetition	Ratio
Attention Focus	Attention Grid	4	80
	Landon Rings Test	1	20
Agility	Shuttle Run	5	100
	20m Between Pointers	1	20
Flexibility	Flexibility of Backward Flexion of the Trunk from Prone	4	80
	Abdominal Flexibility	1	20

The research tests used

Attention Grid Concentration Test: (1)

This test, called the (Grid concentration test), is used to measure the player's ability to focus his attention.

The duration of this test is only one minute and the player is asked to put a dash (/) on the largest number of numbers following the specific number determined by the tester. For example, when determining the starting number with the number (17), for example, the test subject should put a dash

(/) on the number (18) and then the number (19) and so on and not try to put a dash (/) on the number (19) first and then (18) again.

This test can be used several times, changing the initial number specified for each subsequent time. The numbers of the concentration grid can also be changed and multiple copies of them can be made, changing the location of their numbers so that the test subject does not get used to memorizing and remembering the location of the numbers. It should be noted that the numbers are all composed of two numbers, such as (01), (02), (23), and so on. The test can also be conducted in many experimental situations, such as performing in front of colleagues or by adding some distracting variables. Correction: Correction is done by counting the numbers that the athlete has crossed out correctly within the one-minute period specified for conducting the test. One point is awarded for each number crossed out correctly. The higher the athlete's score, the higher his ability to focus attention, as in Figure (5).

84	27	51	78	59	52	13	85	61	55
28	60	92	04	97	90	31	57	29	33
32	96	95	39	80	77	49	86	18	70
76	87	71	95	98	81	01	46	88	00
48	82	89	47	35	17	10	42	62	34
44	67	93	11	07	43	72	94	69	56
53	79	05	22	54	74	58	14	91	02
06	68	99	75	26	15	41	66	20	40
50	09	64	08	38	30	36	45	83	24
03	73	21	23	16	37	25	19	12	63

Figure (1) Attention Focus Network Test

The second test: shuttle running (rebound) test (4 × 9) m.

- **The purpose of the test:** Measuring agility.
- **Tools and supplies:** Stopwatch, chalk, whistles
- **Performance description:** Two parallel lines are drawn with a distance of (9) m between them, the starting line and the other the opposite line (where a toy or ball is placed on this line), the tester stands behind the start, and upon hearing the start signal, he runs at full speed to the opposite line to cross with both feet and bring that toy, then turns around to return again to cross the starting line in the same manner, and so on, repeating twice, meaning that the tester covers a distance of (36) m back and forth.
- **Recording:** The time the tester covered in running the specified distance is recorded to the nearest fraction of a second.

The third test: trunk flexion test backwards from prone position.

- **The purpose of the test:** measuring the posterior flexibility of the spine.
- **Tools:** measuring tape divided in centimeters.
- **Performance specifications:** From the prone position, the palms are interlocked behind the head with the lower limb fixed by a colleague. The subject slowly bends the trunk backwards to the maximum extent possible and holds for two seconds. The distance from the bottom of the chin to the ground level is measured using a

measuring tape, so that the tape is in a vertical position on the ground and in front of the subject's head during the measurement, with the chest touching the ground.

Conditions

1. Each subject has two attempts, the best of which is recorded.
2. The trunk must be raised calmly and slowly to reach the maximum possible distance and hold for two seconds.
3. Any violation of the conditions will cancel the attempt.

Recording: The number indicating the distance from the ground to the bottom of the chin in centimeters is recorded for the subject, for the best of the two permitted attempts.

Exploratory experiment

The exploratory experiment is (practical training for the researcher to identify the negatives and positives that he encounters during the test to avoid them). The researcher conducted an exploratory experiment on 11/17/2023 on a sample of guards affiliated with the specialized school, numbering (4) guards, before conducting his research with the aim of choosing research methods and tools.

Pre-tests

The researcher conducted the pre-tests before starting the training curriculum, which included the tests (attention concentration test, flexibility and agility measurement test) at exactly two o'clock in the afternoon on 11/25/2023 in the Olympic Stadium Hall.

Training curriculum

The exercises were applied during the training units for the experimental group only and in the main section corresponding to 12/1/2023 at three o'clock in the afternoon at the Tigris Sports Club Stadium.

Then the researcher applied these exercises to his research sample represented by the experimental group, which had (7) players. This group applied the exercises for (8) weeks at a rate of three training units per week. This sample underwent two measurements before and after the tests under study. As for the second group, which had (7) members, it did not apply the special exercises, but rather worked according to the method prepared by the team coach and was also subjected to two measurements before and after the same tests that the experimental group underwent.

The researcher took into account the following observations when applying his special exercises: The special exercises were applied at the beginning of the main section of the training unit. The intensity of the exercises depended on the intensity of the training unit set by the team coach. The number of training units reached (24) training units. The time taken to give these exercises varied from one week to another, as the time of these exercises began to increase from the second week until the eighth week, as the total time of the exercises during the (8) weeks under study reached (1152 minutes), and Table (3) shows this.

Table 3: Shows the exercise time in one training unit and in one week and the total exercise time during (8) weeks.

Weeks Times	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Total time for special exercises during (10) weeks
	Exercise time in one training unit	30 m	33 m	46 m	49 m	52 m	55 m	58 m	
Exercise time in one week	90 m	99 m	138 m	147 m	156 m	165 m	174 m	183 m	1152 m

Post-tests

The researcher conducted the post-tests for his research sample (experimental and control groups) on 2/1/2024. He followed the same method he followed in the pre-tests after the end of the specified period for the experiment, which took 8 weeks. The researcher was keen to find all the conditions for the pre-tests and their requirements when conducting the post-tests in terms of time, place and testing methods.

Statistical Methods

In order to achieve the study objective, the researcher used the Statistical Package for Social Sciences (SPSS): (Percentage law, arithmetic mean, standard deviation, median, t-test for related samples, t-test for unrelated

samples, skewness coefficient, t-test for two related averages).

Presentation, analysis and discussion of the results

Presentation and analysis of the results of the tests Focusing attention on agility and flexibility for futsal referees: The researcher applied the tests to the main research sample for the two groups (experimental and control) consisting of (7) referees for each group.

Display and analysis of the results of the pre- and post-tests of the experimental group: After the researcher unloaded the data of the pre- and post-tests of the experimental group, and processed them statistically, it was shown as in Table (4).

Table 4: Shows the results of the pre- and post-tests of the experimental group

Statistical transactions Test name	Unit of measure	Pre-tests		Post-tests		Calculated (T) value	Perhaps value	Significance
		S	A	S	A			
Attention concentration	Number	7.143	1.345	10,857	0,899	5,461	0.00	significant
Agility	Sec.	12.084	1.176	9,461	1,154	5,969	0.00	significant
Flexibility	cm	5.143	0.690	8,286	0,488	12,050	0.00	significant

Degree of freedom (n-1) (7-1=6), statistically significant at a significance level of $\geq (0.05)$

By reviewing Table (4), which shows the results of the pre- and post-test for the experimental group in focusing attention, it becomes clear to us that the arithmetic mean of the pre-test was (7.143) degrees, with a standard deviation of (1.345), while the arithmetic mean in the post-test was (10.857) degrees, with a standard deviation of (0.899).

When using the (T-Test) law for correlated samples, the calculated (T) value appeared (5.461) below the significance level of (0.00), which indicates its significance at a significance level of (0.05) and with a degree of freedom of (6), and thus the difference is statistically significant in favor of the post-test.

In the agility test, the arithmetic mean of the pre-test results was (12.084) degrees, with a standard deviation of (1.176), while the arithmetic mean in the post-test was (9.461) degrees, with a standard deviation of (1.154).

When using the (T-Test) law for correlated samples, the calculated (T) value appeared (5.969) below the significance

level of (0.00), which indicates its significance at a significance level of (0.05) and a degree of freedom of (6), and thus the difference is statistically significant in favor of the post-test. As for the flexibility test, the arithmetic mean of the pre-test results was (5.143) degrees, with a standard deviation of (0.690), while the arithmetic mean in the post-test was (8.286) degrees, with a standard deviation of (0.488). When using the (T-Test) law for correlated samples, the calculated (T) value (12,050) appeared below the significance level (0.00), which indicates its significance at the significance level (0.05) and with a degree of freedom (6), and thus the difference is statistically significant and in favor of the post-test.

Presentation and analysis of the results of the pre- and post-tests for the control group:

After the researcher unloaded the data for the pre- and post-tests for the control group, and processed them statistically as shown in Table (5).

Table 5: shows the results of the pre- and post-tests for the control group

Statistical transactions Test name	Unit of measure	Pre-tests		Post-tests		Calculated (T) value	Perhaps value	Significance
		S	A	S	A			
Attention concentration	Number	6.919	1.155	6,067	0,791	3,785	0.01	significant
Agility	Sec.	12.336	1.011	11,557	0,363	2,202	0.07	Not significant
Flexibility	cm	4.857	0.690	5,714	0,756	6,000	0.00	significant

Degree of freedom (n-1) (1-7=6), statistically significant at a significance level of $\geq (0.05)$

By reviewing Table (5), which shows the results of the pre- and post-test for the control group in focusing attention, it becomes clear to us that the arithmetic mean of the pre-test was (6.919) degrees, with a standard deviation of (1.155), while the arithmetic mean in the post-test was (6.067) degrees, with a standard deviation of (0.791).

When using the (T-Test) law for correlated samples, the calculated (T) value appeared (3.785) below the significance level of (0.01), which indicates its significance at a significance level of (0.05) and with a degree of freedom of (6), and thus the difference is statistically significant in favor of the post-test.

As for the agility test, the arithmetic mean of the pre-test results was (12.336) degrees, with a standard deviation of (1.011), while the arithmetic mean in the post-test was

(11.557) degrees, with a standard deviation of (0.363). When using the (T-Test) law for correlated samples, the calculated (T) value appeared (2.202) below the significance level of (0.07), which indicates its significance at a significance level of (0.05) and a degree of freedom of (6), and thus the difference is statistically significant in favor of the post-test, only the high tapping is not significant. As for the flexibility test, the arithmetic mean of the pre-test results was (4.857) degrees, with a standard deviation of (0.690), while the arithmetic mean in the post-test was (5.714) degrees, with a standard deviation of (0.756).

When using the (T-Test) law for correlated samples, the calculated (T) value (6,000) appeared below the significance level (0.00), which indicates its significance at the significance level (0.05) and with a degree of freedom (6),

and thus the difference is statistically significant and in favor of the post-test.

Presentation and analysis of the results of the post-tests for the experimental and control groups:

Table 6: Shows the post-tests for the experimental and control groups

Statistical transactions	Unit of measure	Experimental group		Control group		Calculated (T) value	Perhaps value	Significance
		S	A	S	A			
Test name								
Attention concentration	Number	10,857	0,899	6,067	0,791	4,159	0.00	significant
Agility	Sec.	9.461	0.154	11,557	0,363	1,059	0.00	significant
Flexibility	cm	8.286	0.488	5,714	0,756	7,562	0.00	significant

Degree of freedom (n-2) (2-14=12), statistically significant at a significance level of $\geq (0.05)$

By displaying Table (6) of the results of the post-tests for the experimental and control groups, it becomes clear to us that the arithmetic mean of the attention focus network test for the experimental group reached (10,857) degrees, with a standard deviation of (0,899), while the arithmetic mean for the control group reached (6,067) degrees, with a standard deviation of (0,791). When using the (T-Test) law for unrelated samples, the calculated (T) value reached (4,159) below the significance level of (0,00), which indicates its significance at a significance level of (0.05) and a degree of freedom of (12), and thus the difference is significant and in favor of the experimental group. In the agility test, the arithmetic mean was (9.461) degrees for the experimental group, with a standard deviation of (0.154), while the arithmetic mean for the control group was (11.557) degrees, with a standard deviation of (0.363). When using the (T-Test) law for unrelated samples, the calculated (T) value was (1.059) below the significance level of (0.00), which indicates its significance at a significance level of (0.05) and with a degree of freedom of (12), and thus the difference is significant and in favor of the experimental group. In the flexibility test, the arithmetic mean was (8.286) degrees for the experimental group, with a standard deviation of (0.488), while the arithmetic mean for the control group was (5.714) degrees, with a standard deviation of (0.756). When using the (T-Test) law for unrelated samples, the calculated (T) value reached (7.562) below the significance level (0.00), which indicates its significance at the significance level (0.05) and with a degree of freedom (12), and thus the difference is significant and in favor of the experimental group.

Discussion of the results

After reviewing the results shown in Table (4), which shows the results of the experimental group in the pre- and post-measurements of the tests under study, and Table (5), which shows the results of the control group in the pre- and post-measurements of the same tests, as well as Table (6), which shows the results of the post-tests for the experimental and control groups, it becomes clear to us that the experimental group had a better level of development than the control group, as evidenced by the results we found in the aforementioned tables.

The results of the experimental group whose members applied TRX exercises and the reason for this improvement is mainly due to the flexibility of the abdominal muscles and the decrease in the curvature of the spine and the increase in the flexibility of the ligaments and the increase in the muscle strength and the increase in the flexibility of the chest muscles as well as to the nature of the proposed rehabilitation program used which led to the development and flexibility of the abdominal muscles and some other muscles. The effect of exercises on the joints through stimulating the movement of the joint and the synovial capsules and the lining membranes is important for the secretion of fluids that are the nutrients and lubricants for the movement of the cartilage which makes

the movement smooth and soft in the joint and helps to increase the movement of the joint as well as helps to upgrade and improve the functional state of the circulatory and respiratory system and improve muscle tone and flexibility and increase the production of fluids secreted by the joint and what supports this statement is returning to the results of Tables (4) (5) (6). As (John, 1983) confirmed, "The athlete with deep concentration is the one who has physical coordination in controlling the stimuli and emotions that affect his being when concentrating and will be in control of the motor duty [1]." This is what was confirmed by (Ghazi, 2000) "that improving the player's mental and intellectual abilities increases his ability to predict, i.e. increases the player's ability to imagine future events during the match, and also develops the player's ability to implement all the tasks and duties and control the course of the game in a balanced manner during the match [2]."

Conclusions and Recommendations

Conclusions

- TRX exercises have a good effect in developing attention focus, agility and flexibility in the experimental group of football goalkeepers
- The superiority of the experimental group in developing attention focus, agility and flexibility in the experimental group of football goalkeepers

Recommendations

1. Introducing TRX exercises into training units for all other players as well as other training categories.
2. The necessity of coaches relying on the quality of these exercises because they are training methods that play an important role.
3. Paying attention to this group in general and trying to integrate them with the players more through caring for them for development

References

1. Khawla Ibrahim Al-Mufarji. Building and standardizing a physical-functional test battery in athletics for people with mild mental retardation. Unpublished doctoral thesis. University of Baghdad, College of Physical Education; c2008.
2. Van Dalen D, Deopold. Research methods in education and psychology. (Translation) Nabil M, *et al.* Cairo: Anglo Egyptian Library for Printing; c1985. p. 21.
3. Abdul-Mutti MA, *et al.* Methodological developments and the scientific research process. 1st ed. Amman: Wael Publishing and Distribution House; c2002.
4. Ghazi Saleh Hamoud. Emotional response and some mental abilities and their relationship to tactical knowledge. PhD thesis, unpublished. College of Physical Education, University of Baghdad; c2000.

5. Alawi MH. Encyclopedia of psychological tests for athletes. 1st ed. Cairo: Book Center for Publishing; c1998.
6. Syes J. Porting body sporting mind. Cambridge: University Press; c1983.
7. ACSM Health & Fitness. ACSM Health fitness: To the novice/older clients. Christian T, Leigh Crews. Introducing you to fitness, March 29, 2012.