

The Effect of the (CRAC) Skills Stretching Exercises (Contract-Relax – Antagonist Contract) on some Special Physical Variables and the Level of Skill Performance among Artistic Gymnastics

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Introduction and research problem:

The sport movement has developed rapidly and effectively over the past years as a result of scientific and technological progress in the development of methods of education, training and equipment. Gymnastics is a sport of beauty, creativity and compatibility.

The performance of the skill is affected by the dynamic range of the joints involved in terms of the effectiveness of the performance or in terms of the extent to which the player may be exposed to injuries related to the impact of the range of motion negatively or positively or increase or decrease, The onset of the dorsal muscle capsule often occurs when the motor length of the shoulder joint is limited, especially in the case where the elbow joint reaches a level parallel to the trunk, which is the end of the thrust stage. The excess range in any joint

exposes it to dissipation under the influence of external resistors. The kinetic range of the joints (14: 385)

Nelson (2004) explains that without flexibility, access to skillful performance in many sports will be impossible (18: 295)

This is confirmed by Joke (2000) that despite the great application of extension exercises aimed at the development of flexibility, but research is still to study the impact of this development on performance is few, as most of the studies dealt with ways to increase flexibility or to identify the relationship between injury incidence and elasticity. The study of the effect of stretching exercises aimed at developing flexibility on performance has not received sufficient research attention (15: 411)

Given the variety and variety of programs, methods and methods of development of flexibility through muscle

prolongation, the researcher believes that the lack of proper recruitment of these methods according to the type of specialized activity and according to the athlete's abilities may make it possible to obtain the desired benefits and that if the development of muscle extension must be tailored to the needs of performance. In the type of activity chosen, as they play a significant role in determining the final output of different forms of performance (11: 294)

Some sports scientists point out that flexibility in the hip and spine is one of the best flexibility measures because of the importance of this movement for human performance. Most players perform flexibility exercises daily, but few know the time allotted, warnings and warnings that ensure their safety (620: 13)

And that the coach must take into account the stability or stop and not pressure in the exercises flexibility passive to the player if he noticed the widening pupil's eye or redness of the skin severely or a tremor in his body or in the parts intended training and can be

considered as a threshold that must not be missed so that it does not occur. Any injury to the player or severe pain may negatively affect the player's ability to exercise flexibility (23: 7)

This is manifested in the difficulty of performing the skills on all gymnastics apparatuses. They gain flexibility, strength, motor speed, balance, muscular compatibility, agility, and motor sense. (Shehata, Ahmed Fouad: 13-14) It is also a sport that requires exceptional motor skills. Some joints or all joints. (25: 11) (111: 6) (1997) Khalid Hossamuddin (1997) notes that regularity in training programs for flexibility and duration leads to a high level of performance of players in their performance and affects Physical elements such as strength, speed and compatibility without any program to develop these qualities (43: 8)

Flexibility and prolongation are indispensable in physical attributes and technical gymnastics skills. Prolonged contraction or contractile contraction (CRAC) technique is one of the methods

of lengthening in the form of neural-neuromuscular furcation stretching, which contributes to the improvement of motor range through exchange between the contraction of the muscular and the opposing muscles. (33:14)

Where the motor range is the distance and direction of the joint between the state of contractions and extinctions. Michael and others (2000m) 6 and in a tool once or twice a week of P.N.F indicated sufficient to increase the Rom from (3-9) degrees according to the detail (953:21)

Despite the extensive application of extension exercises aimed at the development of flexibility, research on the impact of this development on performance is still low. Most of the studies examined ways to increase flexibility or to identify the relationship between incidence and flexibility. Extensive exercises aimed at developing flexibility on performance did not receive sufficient research attention (15: 411.)

،(١٦) ،(٥) ،(٤) whose results indicate the importance of flexibility in gymnastics and its effect on the development of

the skilled performance of females. Here, the researcher considered the importance of recognizing the effect of longitudinal exercises in the manner of relaxation, the researcher also believes that this method may provide better opportunities for improving physical performance on the one hand, as well as improving the level of benefit from the flexibility of the students. The characteristics and benefits of the work within the motor sentence, with the economy in time and effort to develop this physical character of the important performance in artistic gymnastics, which prompted the researcher to conduct this study to identify the impact of the training exercises in the form of contractions relaxation - the contraction of some special physical variables and the level of dramatic performance in Young girls.

Search goal

The aim of this research is to identify the effect of stretching exercises in the form of contractions, relaxation, and contraction on certain physical variables and the level of

athletic performance of artistic gymnasts.

Research hypotheses

١ -There are statistically significant differences between the averages of the pre and post measurements at the level of some physical variables among the gymnastics women in the research sample.

٢ -There are statistically significant differences between the averages of the pre and post measurements in the level of skilled performance in the artistic gymnastics among the gymnastics youth of the research sample.

Some of the terms in the search

Flexibility

Is the ability to move in a wide range of motion (20:203)

Elasticity

Is the ability of the muscle or anybody to return to its normal state before it was subjected to prolongation after the disappearance of the impact of tension that led to the occurrence of this prolongation (62:12)

Neurological Facilities (P.N.F)

Proprioceptive neuromuscular facilitation is the control of neuromuscular techniques by stimulating sensory receptors (18:19)

Research Plan and Procedures:

Research Methodology:

The researcher used the experimental approach for one experimental group.

The research sample

The study included (10) girls from the Academy of the Future in Asyut for the Sunni level (5-7). 10 female participants were used as basic samples, in addition to (8) women to conduct scientific research.

Distribution of sample members:

The researcher examined the extent of the distribution of research individuals in the light of the following variables: Growth rates "age, height, weight, training age", physical and skill variables in the research and table (1)

Table (1)
Arithmetic mean, median, standard deviation, and torsion coefficient for growth rates the physical and skill variables are under consideration N = 10

Variables		Measuring unit	The research sample			
			Average	Mediator	standard deviation	Torsion coefficient
Growth rates	Age	Year	9.79	9.00	0.77	0.97
	Height	Cm	110.00	110.00	4.20	0.30
	Weight	Kg	30.40	30.00	3.24	0.37
Physical variables	Test the elasticity of the spine	Cm	19.70	19.00	1.07	0.28
	Test the flexibility of the shoulder joint from the horizontal position	Cm	34.00	34.00	2.77	Zero
	Test pelvic elasticity (feet apart for maximum range)	Cm	10.30	10.00	2.08	0.30
	Test the torso of the stand.	Cm	14.40	14.00	2.37	0.13
	Flexible foot joint (catch up)	Cm	7.70	7.70	0.20	0.28
	Flexible foot joint (catch down)	Cm	9.81	9.80	0.41	0.21
Technical variables	Stand on your hands	Degree	0.74	0.70	0.21	0.370
	Front balance	Degree	7.04	7.00	0.87	0.800
	Rear balance	Degree	7.37	7.30	0.11	0.740
	Stand on the shoulders	Degree	7.33	7.30	0.87	0.178
	Full axial cycle	Degree	0.44	0.40	0.17	0.321

Table (1) shows that the values of the torsion coefficients for the growth rates and the physical and skill variables under study for the two research groups are limited to (+3, -3) indicating the moderation of the distribution of the research sample in these variables.

Search tools

- 1-Data registration form
- 2-Measurements subject of study (flexibility of the shoulder joint - flexibility of the hip joint -

flexible spine - and the level of skilled performance in the gymnastics ground)

٣-Tools (measuring tape-stopwatch - floor mat)

٤- Devices (dynamometer-manometer - video camera)

Survey Study

The researcher conducted the survey in the period from 28/9/2016 to 2/10/2016 to determine the appropriate extent of the proposed exercises, the tools used, the method of

measurement, the place of conducting the experiment, training the assistants and their understanding of the nature of the experiment.

Scientific transactions for the tests in question:

A. Honesty:

To calculate honesty, the researcher calculated the honesty of differentiation by applying the physical and skill tests in the gymnastics of the ground

movements in the research on the female sample of the survey sample from outside the sample of the research and they have the same characteristics of the original sample of the first physically and skillfully and the other non-discriminating, The researcher calculated the significance of the differences between them and Table (2) shows the result.

**Table (2)
Indication of differences between discriminating and non-discriminating in tests Physical and skillful research (N = 8)**

Variables	Measuring unit	Distinguished (N = 4)		Non-privileged (N = 4)		T value	Level of significance
		M	E	M	E		
Test the elasticity of the spine	Cm	18.60	0.29	22.18	0.20	3.38	significance
Test the flexibility of the shoulder joint from the horizontal position	Cm	36.28	0.33	31.28	0.32	3.21	significance
Test pelvic elasticity (feet apart for maximum range)	Cm	14.60	0.21	17.63	0.14	3.29	significance
Test the torso of the stand.	Cm	16.02	0.14	13.20	0.96	3.14	significance

Follow able (2)
Indication of differences between discriminating and non-
discriminating in tests Physical and skillful research (N = 8)

Variables	Measuring unit	Distinguished (N = 4)		Non-privileged (N = 4)		T value	Level of significance
		M	E	M	E		
Flexible foot joint (catch up)	Cm	٨.٥٦	٠.٨٧	٧.١٠	٠.٢١	٣.٨٧	significance
Flexible foot joint (catch down)	Cm	١٠.١٥	٠.٣٢	٨.٢١	٠.١٧	٣.٦٢	significance
Stand on your hands	Degree	٥.٨٨	٠.١٥	٣.٦٢	٠.٢١	٣.١٧	significance
Front balance	Degree	٦.٨٤	٠.٦٣	٣.٨٩	٠.١٧	٣.٢١	significance
Rear balance	Degree	٦.٤١	٠.٤١	٣.٧٩	٠.١٦	٣.٦٩	significance
Stand on the shoulders	Degree	٦.٢١	٠.١٧	٣.٩٤	٠.١١	٣.٢٢	significance
Full axial cycle	Degree	٥.٨٤	٠.١٦	٣.٧٧	٠.١٣	٣.٧٤	significance

*The value of (t) of the table to the level of 0,05 = 2.920

It is clear from Table (2) that there are statistically significant differences between the experienced and non-privileged women in the physical and skill tests under study and in the direction of the female students in these tests, since all values of (T) are greater than their tabular value at the significance level 0.05, Tests and their ability to distinguish between groups.

B: Persistence:

To calculate the stability of the physical and technical tests in question, the researcher used the method of applying the test and its reapplication on a sample of (8) females from outside the research sample and they have the same specifications of the original sample with a time interval of three (3) days between the first and second applications. Table (3) Link between the two applications.

Table (3)
Correlation coefficients between the first and second applications of
the tests Physical and skillful research (N = 8)

Tests	Measuring unit	First application		Second application		Coefficient of correlation
		M	E	M	E	
Test the elasticity of the spine	Cm	19.20	0.79	19.00	0.77	0.80
Test the flexibility of the shoulder joint from the horizontal position	Cm	34.70	2.87	34.40	3.44	0.94
Test pelvic elasticity (feet apart for maximum range)	Cm	14.70	0.90	14.20	1.93	0.82
Test the torso of the stand.	Cm	10.40	1.08	10.00	1.73	0.86
Flexible foot joint (catch up)	Cm	8.98	0.06	9.10	0.36	0.89
Flexible foot joint (catch down)	Cm	11.32	0.32	11.00	0.18	0.98
Stand on your hands	Degree	0.78	0.39	0.70	0.36	0.971
Front balance	Degree	7.81	0.21	7.80	0.02	0.972
Rear balance	Degree	7.38	0.17	7.30	0.14	0.971
Stand on the shoulders	Degree	7.30	0.30	7.30	0.11	0.970
Full axial cycle	Degree	0.47	0.17	0.40	0.74	0.974

The value (t) of the table at the level of significance (0.05) = 0.632

It is clear from Table (3) that the correlation coefficients between the first and second applications of the physical and skill tests in the study ranged from (0.82: 0.97) which are statistically significant correlation coefficients indicating the stability of these tests.

Design of the proposed program:

(٢٢) ،(٩) ،(٨) ،(٧) used by the researcher in the preparation and design of the proposed extension program, as well as the work of a questionnaire and its presentation to the experts shows that it is not possible to improve the positive range of any detail unless available The negative aspect of this joint cannot be overstated, since the positive range cannot exceed the negative range. Therefore, the researcher believes that the training processes should be conducted during the extension program through two parallel systems that work and complement each other.

1- work to improve the negative range of the joint and through the ways that work to achieve this.

2- work to improve the positive range of the joint and try to make it close to the negative range obtained (surplus flexibility), and this through other methods of prolongation working to achieve this.

In the previous presentation, the researcher believes that relying on one method of development of muscle prolongation will be ineffective. Therefore, it is necessary to include any program of muscle lengthening in several ways that work through the above mentioned systems. In addition, Similar to the performance with the use of the device movements of ground and tools in the exercises used, thus achieving the principle of privacy in the development of flexibility so that the integration of the training process.

Objectives of the proposed program:

-Increase the range of motor in the joints selected through muscle prolongation.

-Improving the level of skillful performance in artistic gymnastics.

the program:

- Duration of the training program: 8 weeks.

- Number of weekly training sessions: (2) units.

- Total number of training units: (16) units.

- The two sets start with warm-up at the beginning of the training module.

- The distance of the lengthening exercises and repetition of the exercises were measured during the same time and the groups were unified to

adjust the size between the exercises.

- The weight belt was used around the hand and foot during the weeks from fifth to sixth and gradually 1/2 kilo and then kilo to be used to narrow the difficulty and use methods of lengthening.

- Joints that improve the flexibility of the program:

Shoulder in the tide direction.
Shoulder in the direction of bending.

Spine in the tide direction.
Spine in the direction of bending.

Knee-bend direction. Foot in the tide direction.

Foot in the bend direction.

Table (4)
Methods of development of muscular lengthening used in the training program

The method	Performance description	Objectives
(D.S)	Move parts of the body with an attempt to increase the range and speed of movement gradually.	Increase the positive range. Activate blood circulation.
(S.S)	Lengthen a muscle or group of muscles maximally lengthen it and then retain this position for a while	Increase the negative range
(A.S)	Reach a certain situation and then keep it without any help	Increase the positive range. Increase muscle strength. Improved skill performance.
(P.S)	Stretching is done by external force through tools or devices with no muscle involvement	-Improve the negative range. -Improve relaxation. Overcome fatigue.
(Re – PNF)	Constriction of muscle contraction until fatigue against resistance	Increase the positive range. Increase muscle strength. Facilitate the beginning of the movement. The accuracy of the motion guidance in the desired direction. Overcome fatigue. Facilitate the activation of nerve signals. Improved endurance.
(RS – PNF)	The exchange of constant contractions between the muscles and the muscles to be lengthened.	Increase negative and positive range. Increase stability and balance. Increase muscle strength. Improve relaxation.

CR-PNF)	The maximum contraction of the shortening of the muscles to be lengthened and then move the tip to the maximum possible negative range and then repeated several times.	Increase negative range. Help to relax.
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Basic Study:

The basic experiment was conducted through the following steps:

Conducting pre measurements in the period from 16/10/2016 to 19/10/2016.

The researcher measured the elasticity variables on the first day and measured the skill level on the second day.

Application of the proposed programs from 23/10/2016 to 16/12/2016.

Conducting dimensional measurements in the period from 19/12/2016 to 21/12/2016

Under the same conditions as pre measurements.

Eighth: Statistical Processes: Search statistically:

In the light of the research objective, the researcher used the following statistical methods (mean arithmetic mean, median, standard deviation, torsion coefficient for growth rates, significance of differences, percentage of improvement or change)

View and discuss the results

First: Presentation and discussion of the first hypothesis:

Table (5)

the significance of the differences between the average of the pre and the post indices in the physical variables and in the research (N = 10)

Variables	Measuring unit	Pre measuring		Post measuring		Differences between the two averages	Rate of improvement	Value (T)	Level of significance
		M	E	M	E				
Test the elasticity of the spine	Cm	١٩,٨٠	١,٣٢	١٦,٢٠	١,٠٣	٣,٦٠	%٢٢,٢٢	٣,٩٨	significance

Test the flexibility of the shoulder joint from the horizontal position	Cm	٣٣,٨٠	٢,٦٦	٣٩,٠٠	٢,٤٥	٥,٢٠	%١٥,٣٨	٣,٢٩	significance
Test pelvic elasticity (feet apart for maximum range)	Cm	١٥,٤٠	٢,٨٤	١١,٩٠	١,٧٩	٣,٥٠	%٢٩,٤١	٣,٤٥	significance

**FollowTable (5)
the significance of the differences between the average of the pre and the post indices in the physical variables and in the research (N = 10)**

Variables	Measuring unit	Pre measuring		Post measuring		Differences between the two averages	Rate of improvement	Value (T)	Level of significance
		M	E	M	E				
Test the torso of the stand.	Cm	١٤,٢٠	٢,٦٦	١٧,٩٠	٢,٠٨	٣,٧٠	%٢٦,٠٥	٣,٦٥	significance
Flexible foot joint (catch up)	Cm	٧,٦٦	٠,٣٩	١١,٣٦	٠,١١	٣,٧٠	%٤٨,٣٠	٣,٦٤	significance
Flexible foot joint (catch down)	Cm	٩,٨٥	٠,٢١	١٢,٦٩	٠,١٥	٢,٨٤	%٢٨,٨٣	٣,١٥	significance

•Tabular value at the significance level (0.05) = 1.734

It is clear from Table (5) that there are statistically significant differences between the pre and post measurements of the experimental group in the physical variables under study, since all values of (T) are greater than their tabular value at significance level 0.05 and in the direction of telemetry.

The progress of the proposed pilot program and the

training program included different resistance, trends, speeds and repetitions developed on a scientific basis, taking into account the application of intensity and volume of loads and intervals of interruptions and the principle of increasing pregnancy during training, which in turn reflected the level of physical qualities and programs planned scientifically

The different settings and aspects have the greatest impact in improving the capabilities of different women.

In the view of the researcher that lengthening in the form of contractions relaxation - constipation is a vital description of the acquisition of skills and a decisive factor in the performance of skills, where flexibility helps to achieve an acceptable level of skill learning and mastery of performance and the development of physical characteristics have a direct impact and a key role in the level of effective physical and skilled performance and that in case The player's lack of these qualities cannot master or develop skillful performance.

The flexibility of the fitness components is different from the rest of the components in terms of its structural and functional characteristics. The term elasticity is used to express the kinetic range of the joints. Most flexibility definitions have agreed to be the ability to move in the range Wide range, ie, the range of motion allowed

by the joints of the body. This range can be measured in all linear units (centimeter in inches), rotational units or angle (14: 19.)

And that each range has a special dynamic range that distinguishes it from the rest of the joints in the body one may enjoy the extent of a broad movement in one of its joints, but this range varies from one detail to another and there are some individuals who enjoy a large dynamic range in all joints may have a role in this inheritance Subject The skill performance is influenced by the dynamic range of the joints involved, whether in terms of the effectiveness of performance or in terms of the extent to which the player may be exposed to injuries related to the effect of the motor range negatively or positively (1: 38)

The use of the technique of contraction and contraction (CRCA) of the muscles of the antibody has improved the range of kinetic joints of the joint work in the performance of skill as well as the development of the driving force sensory receptors in addition to the precise direction of the movement, and thus

improve the level of skill performance and this corresponds to what indicated mechanism Bob Anderson (2005) suggests that flexibility and longitudinal training leads to higher performance (266: 2)

The results of this study are consistent with the study of

both Sahar Marsi (2015), 3 and Azzali Qassem (2004) (5), whose results indicate the importance of the development of the element of flexibility and originality because of its positive impact in improving the digital level of gymnastics.

The first.

Table (6)

Indications of the differences between the average of the pre and the post indices in the level of skilled performance under consideration (N = 10)

Variables	Measuring unit	Pre measuring		Post measuring		Differences between the two averages	Rate of improvement	Value (T)	Level of significance
		M	E	M	E				
Stand on your hands	Degree	0.60	0.96	1.60	0.24	3.00	%04.46	4.11	significance
Front balance	Degree	6.48	0.21	1.91	0.21	2.43	%37.00	4.26	significance
Rear balance	degree	6.28	0.17	9.10	0.36	2.82	%44.90	4.02	significance
Stand on the shoulders	Degree	6.20	0.31	1.80	0.11	2.60	%11.60	4.26	significance
Full axial cycle	Degree	0.41	0.17	1.20	0.41	2.84	%02.49	4.41	significance
Elastic foot hinges (catch down)	Cm	9.80	0.21	12.69	0.10	2.84	%21.83	3.10	significance

•Tabular value at the significance level (0.05) = 1.734

It is clear from Table (6) that there are statistically significant differences between the pre and post-experimental measurements of the experimental group in the technical variables in the study,

since all the values of (T) are greater than their tabular value at the significance level 0.05 and in the direction of post-measurement.

The researcher explained the differences in the improvement to the proposed

training program used on the experimental research group since it is necessary to work on the development of these qualities in an integrated and balanced according to the performance requirements in different performance methods, in order to achieve the ideal performance.

Despite the extensive application of extension exercises aimed at the development of flexibility, research on the impact of this development on performance is still low. Most studies discussed ways to increase flexibility or to identify the relationship between incidence and flexibility. Extensive exercises aimed at the development of coercive flexibility on performance have not received enough research attention (8:11)

Flexibility cooperates with many elements such as strength, endurance, speed and compatibility to create the perfect performance of motor skills. The low level of flexibility leads to the inability to work effectively to develop strength. Strength growth is associated with the ability to perform exercise along the range of motion. (9: 293, 295)

The researcher explained the flexibility according to the performance needs in gymnastics for women through the performance of exercises to create flexibility within the program in order to take advantage of some flexibility characteristics on the one hand and work on the appropriate range of the performance methods of the five skills on the other hand while maintaining the fluid state of the young during the performance, The researcher said that the development of flexibility is a new perspective to improve performance by improving flexibility according to performance needs

The technique of contraction - contraction and contraction of muscles corresponding to the neurotransmitters of the sensory receptors (PNF CRAC) has had a positive effect in increasing the motor range of joints of the muscles involved in the performance of skill in increasing the range of motor joints (shoulder - back - pelvis) Of the muscles involved in the performance of skills, as the exchange of contractions between the muscles and the

movement of the movement leads to an improvement in the motor range of joints and this confirms Allen (12) that the performance of the exercise PNF once or twice a week by repeating once increases the motor range ROM of the joint muscle in the process Yen from 3 to 9 degrees and thus have achieved a second hypothesis.

Results

١-Exercise exercises in the relaxed style of relaxation - the contraction has a positive effect on improving the flexibility of the spine and thigh - shoulder joints.

٢-Short-term flexibility exercises have a better positive effect than the positive elasticity of joints.

٣-The use of the proposed program positively affects the level of skilled performance in artistic gymnastics.

Recommendations

١-the need to use stretching exercises in the style of relaxation - relaxation of the development of the element of flexibility.

2-Conduct further studies to develop the flexibility of other joints

3- Application of the program in other Sunni stages

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