



Training effects of modern artistic exercises in improving some physical variables and sensory system among rhythmic gymnasts under (12) years

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Abstract

The aim of the research to identify the training effects of modern artistic exercises in improving some physical variables and the sensory system among rhythmic gymnastics players under (12) years, and the experimental approach with a single experimental group was used in the way of tribal, inter-dimensional, and measurements, and the study was applied to a sample consisting of (10) gymnastics players In the Alexandria Union Club, and the researchers designed a program for modern technical exercises, and it was trained for a period of (12) weeks, at the rate of (3) weekly training units.

The most important results were that the use of modern artistic exercises represented by free exercises and tools led to the improvement of some physical defects and elements of the sensory system and the level of skill performance of female rhythmic gymnasts under (12) years.

Through this, researchers are recommended to use modern artistic exercises to improve physical expressions, elements of the sensory system, and the level of skill performance of rhythmic gymnasts, and to conduct similar studies to find out the effect of modern artistic exercises on various sports activities.

Keywords : (modern artistic exercises, sensory system, rhythmic gymnasts)

Introduction:

Modern artistic exercises are characterized by aesthetics and emotional expression, as they link basic and rhythmic exercises with acrobatic movements, dance and ballet with musical accompaniment, and they are performed with or without tools, individually or collectively, and internal championships and international competitions are held for them, and they follow rules and laws that define the ways to award grades and calculate the difficulty of movements and Genesis. (23: 18), (21: 9).

The direction and control of motor and skill performance depends on the level of growth and development of the functional characteristics of a number of psychological processes that represent the basic basis for directing and controlling performance. (40:25)

The main sensory systems are the visual system, vestibular apparatus, and somatosensory receptors. (9: 137)

The sense of sight is the most valuable and most beneficial to the human senses, and the visual system represents the main effect of balance, as it provides the body with information about the environmental environment, location, and the speed of movement of persons. (46: 161)

The visual system affects the balance control of situations where other sensory systems fail, and when there is a conflict of sensory information about the sensory system

responsible for the equilibrium process. (45:41), and the effectiveness of performance in many motor activities depends on the level of functional competence of the vision analyst in distinguishing goals, and the exercise of these activities leads to an increase in his efficiency. (24:37)

The vestibular apparatus integrates with the visual system and the sensory sensory systems to stabilize the balance, and is characterized by being the most physically stable of the three systems. When it issues initial signals from the middle ear, it begins to perform its tasks of stabilizing the balance by controlling the body's balance by reflections from the thorn system - vestibular and cerebellum, which interacts with the cerebral cortex with data from the visual system - vestibular by the inner nodes of the middle ear, secreting an inhibitory factor that affects vestibular nuclei, in addition to the signals from the visual system, which in turn support Vestibular response to the cerebellum eventually adjusting, modifying, and modeling data to produce the final reaction by proportioning the eye and the head velocity. (43:41), (9: 137)

The somatosensory receptors are one of the components of the hierarchical system of the central nervous system that begins to function since the reception of signals and their translation, and this system provides the body with two types of information represented in the (muscular sensory

self-receptors and articulated inputs, then it sends signals about the joint position and the type of movement, and mechanical receptors in the soles of the foot reach Signs of pressure change patterns and the momentum force that results from body movements), and both of these types of information can determine the degree and quality of disturbances occurring in an individual's balance during stability or movement to induce motor control. (44: 159)

The sense of time is related to rhythm and motor timing to complete motor skills in a timely manner, because of its great importance in sports activities. (15:14), and it is considered one of the most important elements leading to linking the various kinetic elements in the overall unit of kinetic performance. (8:21)

The sense of time depends on the training condition, when the mathematical form decreases, the sense of time decreases, and if it rises, an improvement in the ability to accurately distinguish the spatial and temporal characteristics of the movement decreases. (11: 227)

In view of the interest in the field of rhythmic gymnastics and its follow-up with different clubs, the study aimed to identify the training effects of modern artistic exercises and its importance in improving some physical variables and the sensory system and the development of both the visual, muscular and kinesthetic sense of time for female rhythmic gymnasts.

Research Objective::

Identify the training effects of modern artistic exercises in improving some physical variables and the sensory system among rhythmic gymnasts under (12) years.

Research hypotheses:

- There are statistically significant differences between the tribal, intra and dimensional measurements in the physical variables under discussion among rhythmic gymnasts.
- There are statistically significant differences between the tribal, intra and dimensional measurements in the sensory system components under discussion among rhythmic gymnasts.
- There are statistically significant differences between the tribal, intra and dimensional measurements in the level of sensory skill performance under discussion among rhythmic gymnasts.

Search procedures :

Research Methodology :

The experimental method with the same experimental group was used in the method of tribal, inter-dimensional and measurements measurements, as it suits the nature of the research.

The human domain:

The players of Al-Ittihad of Alexandria club, whose number is (17).

Time domain:

The study was conducted from 14/2/2017 to 5/30/2017 as follows:

- 1- The surveys were conducted in the period from 2/14/2017 to 2/18/2017.
- 2- The tribal measurements were carried out from 21/2/2017 to 25/2/2017.
- 3- The basic study was conducted in the period from 26/2/2017 to 5/30/2017.
- 4- Interlayer measurements were carried out from 4/14/2017 to 4/18/2017.
- 5- Dimensional measurements were carried out from 25/5/2017 to 5/30/2017.

Location:

Alexandria Union Club.

Research Sample:

The basic study was applied to an intentional sample of (10) gymnasts who represented (58.8%) of the total original community in the Alexandria Union Club.

While reconnaissance studies were applied to a sample of (7) gymnasts from outside the main study sample.

Pilot studies:

First pilot study:

The selection and determination of the most appropriate physical tests and measurements, the components of the sensory system, the level of skill performance in the skills of modern technical exercises, and resulted in the identification of these tests. Attachment (1)

The pilot study:

Calculation of scientific coefficients for measurements and tests under study. Tables (1),(2),(3),(4), (5), (6).

Attachment (2)

The Third pilot study:

Define the exercises and design the training program. Attachment (4)

The tools and devices used to carry out the experiment:

Medical scale Criteria for measuring weight in kilograms - Restimeter for measuring height in centimeters - Dynamometer for measuring muscle strength - Balance beam for measuring movement balance - Stopwatch for measuring time - Digital camera with a special holder - Measuring tape in centimeters - Rug - Rhythmic gymnastics - Divided boxes - Jumping ladder Spring ropes - medical balls of different weights - plastic balls - collars - Swedish seats.

Statistical treatments:

The Spss statistical program was used to extract the following statistical treatments:

Arithmetic mean - standard deviation - difference coefficient - torsional coefficient - flattening coefficient - difference between the two averages - value (T) - honesty coefficient - correlation coefficient - percentage improvement - percentage of differences - analysis of variance (P) - L.S.D

Table (7)*Statistical description of the data of the total research sample in the main variables before the experiment n = 10*

statistics variables	Measurement unit	Mean	Standard deviation	Skewness coefficient	Coefficient kurtosis	Coefficient of variation%	
Basic variables	Age	Year	11.40	0.52	0.48-	-2.22	4.53
	Height	cm	137.10	3.38	0.15	-1.40	2.47
	Weight	Kg	36.10	2.47	0.36	-1.52	6.84
	Training age	Year	6.40	0.52	0.98	-2.28	8.07

It is clear from Table (7) for the homogeneity of the data of the research sample in the main variables that the values of the torsion coefficient ranged between (-0.48, 0.98) which are values between ± 3 and approach to zero, and this confirms that the sample is free from defects of non-moderate distributions, as well The values of the coefficient of variation ranged between (2.47% - 8.07%) which is less than 20% of the average, which indicates the homogeneity of the research personnel in all variables under investigation.

Table (8)*Statistical indications of physical variables for the total sample in question n = 10*

Statistics Physical variables	measurement unit	Mean	Standard deviation	Skewness coefficient	Coefficient kurtosis	Coefficient of variation%	
Fixed maximum force	Right fist force	Kg	10.70	1.95	-0.49	-1.83	18.19
	Left fist force	Kg	10.80	2.15	0.31	-1.22	19.92
Distinctive force speed	Lift the two men out of sleep in 30 w	Number	18.70	1.77	0.27	0.01	9.45
	Bend the arms from the oblique flatness 30 w	Number	12.50	0.53	0.00	-2.57	4.22
Ability	Wide jump	cm	137.40	11.42	-0.52	-1.61	8.31
Compatibility	Skipping rope	Number	1.50	0.23	0.23	-2.57	15.14
Flexibility	Drape the trunk in front of the bottom	cm	12.00	1.56	-0.22	-1.34	13.03
	The torso folded behind	cm	8.90	1.73	0.03	0.10	19.43
	The two men opened a grand car	cm	1.50	0.28	-0.89	-0.16	18.67
Balance	Stand on one foot	Second	5.70	1.09	0.64	-0.99	19.20
	Running on the balance beam	Second	8.30	0.82	-1.58	0.98	9.88
Agility	Rebound run	Second	73.10	2.33	0.05	-0.91	3.19

It is clear from Table (8) for the homogeneity of the data of the research sample in the physical variables that the values of the torsion coefficient ranged between (-1.58, 0.64) which are values between ± 3 and approach to zero, and this confirms that the sample is free from defects of non-moderate distributions, as well The values of the coefficient of variation ranged between (3.19% - 19.92%) which is less than 20% of the mean, indicating the homogeneity of the research personnel in all variables under investigation.

Table (9)
Statistical indications of the variables of the sensory system elements of the total sample in question n = 10

statistics	measurement unit	Mean	Standard deviation	Skewness coefficient	Coefficient kurtosis	Coefficient of variation%
Sensory system elements						
Error sensing the jump distance	cm	10.70	1.95	0.21	-0.88	18.18
Error sensing a distance without visual control	cm	68.00	10.33	-0.27	-0.90	15.19
Wrong sense of time	Second	8.10	1.20	-1.20	0.14	14.78
Feeling of force	Kg	6.50	1.18	0.42	-1.73	18.17

It is clear from Table (9) for the homogeneity of the research sample data in the sensory system elements that the values of the torsional coefficient ranged between (-1.20 and 0.42) which are values between ± 3 and approach to zero, and this confirms that the sample is free from defects of non-moderate distributions, Likewise, the values of the coefficient of variation ranged 6 between (14.78% - 18.18%), which is less than 20% of the average, indicating the homogeneity of the research personnel in all variables under investigation.

Table (10)
Statistical indications of the skill level of the total sample in question n = 10

Statistics	measurement unit	Mean	Standard deviation	Skewness coefficient	Coefficient kurtosis	Coefficient of variation%
Skill performance level						
Gap Dart Skill	mark	5.30	0.82	-0.69	-1.04	15.53
Weighted man free and Musk behind (Catchback)	mark	4.40	0.84	-1.00	-0.67	19.17
The rotation of the free man is horizontal	mark	4.30	0.67	2.28	4.77	15.70

It is clear from Table (10) for the homogeneity of the research sample data in the skill performance level that the values of the torsion coefficient ranged between (-1.00 and 2.28) which are values between ± 3 and approach to zero, and this confirms that the sample is free from defects of non-moderate distributions, Likewise, the values of the coefficient of variation ranged between (15.53% - 19.17%), which is less than 20% of the average, which indicates the homogeneity of the research personnel in all variables under investigation.

Basic experience:

The study started by applying the program as follows:

Pilot group: underwent a training program for modern technical exercises.

Training Program: Attachment (4)

- The circular training method was used to apply the intensity (low-high) intensity training, taking into account the increased pregnancy through gradual increase in pregnancy and continuity.
- The experiment lasted for a period of (12) weeks, with (3) weekly training units.
- - The number of training educational units for the offer reached (36) units.
- The principle of pregnancy and rest was used as a basis for training.
- Average performance time for each exercise is 30 seconds.
- Average time to rest (45) seconds.
- (Including it from registrations and moving to the next station to perform the next exercise using warm-up exercises 45 w, at the moment when the average number of heartbeat reached approximately 120 beats / s.
- After teaching the correct performance of the exercises, the maximum number of iterations was calculated, then dividing the maximum number of repeats for each exercise $\div 2$.
- The number of groups in the training unit from (3) to (5).
- Average rest time between groups in the training unit from (3 BC) to (5 BC).
- The mean rest time was calculated after returning the pulse rate from 120: 130 beats / min. (20: 262 - 263), (19: 386 -387)

Results and discussion:**Results:***Table (11)**Statistical indications of physical variables of the experimental group before, between, and after the experiment*

statistics		measurement unit	Pre measurement		Between measurement		Post measurement		F Values
			Mean	SD	Mean	SD	Mean	SD	
Physical variables									
Fixed maximum force	Right fist force	Kg	10.70	1.95	11.30	1.64	13.40	1.78	146.68*
	Left fist force	Kg	10.80	2.15	11.80	2.10	13.50	2.07	70.86*
Distinctive force speed	Lift the two men out of sleep in 30 w	Number	18.70	1.77	22.10	1.73	27.20	1.62	130.39*
	Bend the arms from the oblique flatness 30 w	Number	12.50	0.53	14.90	1.20	21.00	1.33	347.98*
Ability	Wide jump	cm	137.40	11.42	143.90	13.77	153.20	11.88	36.61*
Compatibility	Skipping rope	Number	1.50	0.23	2.90	0.57	4.70	0.48	119.79*
Flexibility	Drape the trunk in front of the bottom	cm	12.00	1.56	9.20	1.14	4.50	1.18	138.01*
	The torso folded behind	cm	8.90	1.73	5.50	0.71	2.70	0.67	109.36*
	The two men opened a grand car	cm	1.50	0.71	4.10	0.74	7.70	1.34	161.56*
Balance	Stand on one foot	Second	5.70	1.09	7.50	1.08	11.70	0.82	108.46*
	Running on the balance beam	Second	8.30	0.82	6.35	0.82	3.90	0.21	231.26*
Agility	Rebound run	Second	73.10	2.33	65.90	3.21	55.40	1.65	144.44*

* Significant at 0.05 level (F significant = 3. 34)

From the table (11) on the statistical significance of the physical variables of the experimental group before, between, and after the experiment, it is clear that there are statistically significant differences at the level of 0.05, between the pre and inter-dimensional measurements in all the physical variables under investigation, where the values of the calculated p within the measurements ranged between (36.61, 347.98) and these values are greater than the tabular (P) value at 0.05.

The least significant difference (L.S.D) was calculated for the difference between the mean of the physical variables of the experimental group before, between, and after the experiment, and the improvement ratios were calculated. My schedule (12) and (13). Attachment (3)

*Table (14)**Statistical indications of the variables of the sensory system elements of the experimental group before, between, and after the experiment*

statistics		Measurement unit	Pre measurement		between measurement		Post measurement		F Values
			Mean	SD	Mean	SD	Mean	SD	
Sensory system elements									
Error sensing the jump distance		cm	10.70	1.95	5.60	2.32	1.60	1.17	63.90*
Error sensing a distance without visual control		cm	68.00	10.33	41.00	9.94	12.50	2.64	93.78*

Wrong sense of time	Second	8.10	1.20	3.50	0.97	1.10	0.99	176.10*
Feeling of force	Kg	6.50	1.18	3.20	0.79	0.40	0.52	67.49*

* Significant at 0.05 level (F significant = 3. 34)

It is clear from the table (14) of the statistical significance of the variables of the sensory system elements of the experimental group before, between, and after the experiment, that there are statistically significant differences at the level of 0.05, between the tribal and inter-dimensional measurements in all the physical variables under consideration, where the values of the calculated p within the measurements ranged between (63.90, 176.10) These values are greater than the tabular value (P) at the level of 0.05.

The least significant difference (L.S.D) was calculated for the difference between the averages of the variables of the sensory system elements of the experimental group before, between, and after the experiment, and the improvement ratios were calculated. My schedule (15), (16). Attachment (3)

Table (17)

Statistical indications of the skill level of the total sample in question n = 10

statistics Skill performance level	Measurement unit	Pre measurement		Between measurement		Post measurement		F Values
		Mean	SD	Mean	SD	Mean	SD	
Gap Dart Skill	mark	5.30	0.82	7.60	0.70	9.80	0.42	150.23*
Weighted man free and Musk behind (Catchback)	mark	4.40	0.84	6.70	0.48	9.50	0.71	212.20*
The rotation of the free man is horizontal	mark	4.30	0.67	7.00	0.67	9.10	0.74	363.56*

* Significant at 0.05 level (F significant = 3. 34)

From the table (17) of the statistical significance of the skill level of the experimental group before, between, and after the experiment, it is clear that there are statistically significant differences at the level of 0.05, between the tribal and inter-dimensional measurements in all variables of the skill level under consideration, where the values of the p calculated within the measurements ranged Between (150.23 and 363.56) these values are greater than the tabular value (P) at the level of 0.05.

The least significant difference (L.S.D) was calculated for the difference between the average skill level of the experimental group before, between, and after the experiment, and the improvement ratios were calculated. My Schedule (18), (19). Attachment (3)

Discussion:

The differences are due to differences with statistical significance between the tribal, intra and post measurements in the physical variables under discussion among rhythmic gymnasts, and between each measurement and the next in favor of the next, to the effectiveness and nature of the proposed applied training program, which is based on the use of modern technical exercises represented in free exercises and With tools that were applied three times a week, where training was done on exercises and their movements were applied sequentially, collectively and regularly.

Free exercises contribute greatly to the development of the individual's ability and physical attributes through performing various skills such as jumping, jumping, balance, flexibility and running around the colleague, as they work to develop sensory-motor perception and neuromuscular compatibility. (27: 41), and that the movement exercises were employed in a correct way In training programs, it has a major impact on the development of physical and skill aspects (26: 60).

It is advised to use special training programs that require the performance of exercises that have close contact with the skills to be implemented in the motor sentence where the best training effect can be obtained if the nature of the exercises used is the same as the nature of performance in competition. (19:19), (28: 246), (31: 111)

And the practice of gymnastics continuously and regularly leads to a significantly increased level of muscle strength when compared to the effort that non-practicing gymnasts are subject to. (6: 508)

The optimal method for developing the strength marked by speed and endurance is the same as the dynamic path during the exercise with the dynamic path of the skill itself, and training using exercises similar to the nature of performance leads to achievement in gymnastics, where this sport needs to characterize privacy by virtue of the nature of the performance of gymnastics skills. (3: 99)

The higher the degree of flexibility, the higher the level of skill performance and the impact on athletic results. On the contrary, the narrow range of work on the joints leads to obstruction of the level of showing strength and speed,

which is reflected in the results of training directed at other motor characteristics. (2: 246)

One of the most important methods of developing agility is the use of exercises that dominate the change in speed, timing, performance of movement and direction. (37: 159) (32: 117)

The improvement of compatibility has to do with the improvement of many physical characteristics, such as speed. The correlation of speed appears in the requirements of kinetic performance in terms of time, as compatibility is related to the form of grace and balance of 10

movement requirements from the formal and spatial levels by moving the body or one of its parts with the required accuracy. (22: 163)

The differences are due to statistically significant differences between the tribal, intra-and dimensional measurements in the sensory system components under discussion among rhythmic gymnasts, and between each measurement and the next in favor of the next to the effectiveness and nature of the proposed applied training program that is based on the use of modern technical exercises represented in free exercises and tools And that was applied three times a week, where training was done on exercises and their movements were applied successively, collectively and regularly.

The main purpose of qualitative exercises with modern artistic exercises related to the kinesthetic sense is to promote the feeling of movement and the general form of skill and the ability to speed its performance and determine the positions of body parts in the void and the force required to contract. (16: 66), (42: 120)

Perception - kinesthetic is the ability to determine the positions and parts of the body in a vacuum and control the direction of the required distance during performance and to stabilize the body and not deviate in any direction, and on this is the correct descent and high accuracy of perceptions - kinetic (13: 13), (36: 82) (42:22), so gymnastics helps to develop a sense of balance, as well as control the body by a large amount compared to other types of sports. (35: 27), and that through the sequence and progression in the skills acquired during work leads to the development of sense perception - Kinetic. (14: 110)

The differences are due to differences with statistical significance between the tribal, intra-and dimensional measurements in the level of skill performance of rhythmic gymnasts, and between each measurement and the next in favor of the next to the progress achieved in physical and variables of some elements of the sensory system, which was the result of applying the program using modern special technical exercises With the skills in question.

The development of the motor link helps to improve the level of compatibility, which in turn leads to improving the level of performance. (22: 46), the technical performance of the rotations in the stages of the kinetic performance of it depends on the movement of the arms with flexibility and the movement of the legs with force and speed in the movement of the pelvis, chest, trunk and shoulders with the rapid movement of the head and looking at a fixed point with the strength of the muscles of the legs and stability (15: 77)

And the development of perception-kinesthetic leads to an increase in the level of performance in skills, and the higher the level of performance in exercises, the less error in the perceptual-kinetic tests, as confirmed by the results of studies (13), (14), (23), (7)), (38), (39), which emphasized that regular training and the use of programs directed to the development of perceptual-motor lead to improving and developing the level of skill performance in exercise and gymnastics.

Conclusions:

- The use of modern artistic exercises represented by free exercises and tools that led to the improvement of some physical expressions and elements of the sensory system for rhythmic gymnasts under (12) years.
- The improvement in physical strippers among rhythmic gymnasts under (12) years as a result of using modern artistic exercises led to an improvement in the level of skill performance.

Recommendations:

- The use of modern artistic exercises to improve physical expressions and the elements of the sensory system and the level of skill performance of rhythmic gymnasts. Carrying out similar studies to know the effect of modern artistic exercises on various sports activities.

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