The effect of a specific training program on the performance of some skills on Parallel Bars for juniors in gymnastics

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Introduction and Research Problem :

Scientific progress in training methods and preparing players is one of the important aspects on which sports progress is based. The kinetic performance represents a mirror that reflects the players'ability to understand the parts and components of movement (2: 36).

Ahmed Mahran (1986 AD) believes that gymnastics is one of the sports activities that has received the attention of all experts. That's because it is characterized by the multiplicity of its devices and skills, with technical methods that form some difficulty for workers in the field of gymnastics training, especially the highly difficult skills that were used during the recent years. (3:10)

"Izzat Al-Kashef" (1987 AD) and Ahmed Al-Jundi (1995 AD) believe that muscle strength is the most important physical characteristic of a gymnast. In addition, studies have shown a direct relationship between sports results and the level of muscle strength growth for the gymnast. It is known that gymnastic exercises and movements require various and different transfers and movements with maintaining the player's body weight as resistance. This necessitates the player to acquire relative strength, especially strength and stability movements. (9:18), (4:18)

Abdul-Aziz Al-Nimr and Nariman Al-Khatib (2000 AD) indicate that the skill preparation must include qualified training that has a close contact with the basic stages of the skills to be implemented on the devices according to the requirements of each device and the nature of performance on it. (1:24)

Through the researcher's experience in the field of gymnastics training, he found that there are deficiencies in the performance of Egyptian players on the parallel apparatus. The researcher attributes these deficiencies to some coaches, especially in the junior stage, who are not interested in choosing the skills with special requirements that can develop into difficulty degrees (F, E, D) which is the maximum Kinds of difficulties. It makes a wasted effort in training the skills that meet the special requirements. In addition, the skillfully preparation for the players to achieve this factor of difficulty degrees is the way and the entrance to the high sporting levels in gymnastics.

The researcher also noticed the lack of interest for some trainers in the specific training of the parallelepiped device, which prompted the researcher to conduct this study to direct the training process by setting up a specific training program aimed at improving

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the level of performance on the parallelepiped device for the age of (10) years. The qualitative training may contribute in improving the level of performance on the parallels for this stage which is the intermediate stage to develop the skill level in the years that follow.

In light of the importance of developing training programs and their direct impact on the level of technical performance, and in the belief of the researcher that the field of preparing junior gymnastics in the Arab Republic of Egypt is still in dire need for many integrated studies in various aspects, the researcher will try to identify the impact of a proposal training program by using specific training on the level of performing some skills on the parallel bars.

Research objective :

Designing a specific training program to improve the level of performance of some skills on the parallel device (handstand stability - L-angle fulcrum - hands-free standing of a V-shaped angle) for juniors under 10 years in gymnastics.

Hypotheses:

1. There are statistically significant differences between the two measurements (pre-post) in the level of muscle strength and the level of skill performance under investigation for both the experimental group and the control group and in favor of the post measurement of the experimental group.

2. There are rates of improvement for the experimental and control groups in the level of muscle strength and the level of skill performance under investigation between the experimental and control groups and in favor of the experimental group.

Procedures:

First : Research method:

The researcher used the experimental method for the experimental and control group.

Second : The research sample :

The research sample was deliberately chosen from the beginners of gymnastics under (10) years, boys from Al-Zuhour Sports Club who are registered in the Gymnastics Federation. They were (12) players, who were divided into two groups; (6 players) for the experimental group and (6 players) for the control group.

1- homogeneity:

The researcher set some variables that may affect the research nature, namely (growth rates "age, height, weight",and athletic age). Table (1) shows the homogeneity of the research sample.

Table (1)
Homogeneity of the research sample in the basic variables

Variables	unit of measure	mean	median	deviation	torsion
Length	cm	133.333	131.5	4.249	1.294
the weight	km	30.916	30	4.122	0.67
Age	year	9.042	9	0.396	0.15
Age of training	year	4.125	4	0.376	0.995

Table (1) shows the homogeneity of the research sample in the variables (age, height, weight, training age) under study, as the coefficient of torsion ranges between ± 3 which falls within the limits of the curve Equinox.

To achieve parity between the two research groups, the researcher registered the significance of the differences between the two groups in the pre-measurement of the tests of the selected variables under consideration, as shown in Table (2).

2- Equivalence:

Table (2)

Equivalence of the experimental and control group in Physical and skill variables   n = 12

Variables	Tests	unit of measure	Experimental group		Control group		T
			Mean	deviation	Mean	deviation	
Muscle strength level	Grip strength	KG	14.333	1.505	14.000	2.097	0.316
	Back strength	KG	32.333	3.188	31.833	5.698	0.188
	Tensile up	Rep	18.833	5.845	15.666	4.274	1.071
	Attached (legs raised high)	Rep	18.166	2.137	19.000	2.190	0.667
	Attached (legs raised high)	Rep	18.166	2.137	19.000	2.190	0.667
Skills	Stability in the foothold corner in an "L" shape	second	81.200	3.96	74.600	1.140	0.001
	Handstand (stability)	second	14.400	0.547	14.200	0.447	0.252
	Handstand from a "V" shape	second	5	0.707	6	1.581	0.111

The tabular "t" value is at 0.05 = 2.571

It is evident from Table No. (2) that there are no statistically significant differences between the experimental group and the control group in the physical and skill variables under discussion, as the calculated value of "t" is less than the tabular value of "t" at the level of 0.05 significance, which indicates to the parity of the experimental group and the control group in the physical and skill variables in the research.

Third: Data collection tools and means: -

Through theoretical readings, previous studies, and the researcher's seeking for the opinions of experts and specialists, the appropriate physical and skill tests to the research were determined.

1- Physical exams :

- (grip strength) using dynamometer.
- (Back strength) using the dynamometer.
- (Attached) full bending of the arms (muscular strength of the arms, shoulders and torso).
- (oblique extension) arm bending (muscle strength of the arms, shoulders and chest).
- (Attached - Mind Wall) Raise the legs high (strength of the lower abdominal muscles). (Attachment 1)

2- Skill measures :

The skill performance of the players was measured by the research sample by a committee of international arbitrators of the Egyptian Gymnastics Federation .

Fourth: The exploratory study:

An exploratory study was conducted on a sample consisting of (5) players from outside the main sample of the research and from the research community in order to ensure the safety of devices , tools, to train assistants and to ensure the suitability of training places and to conduct scientific transactions for the tests under investigation.

Fifth : the scientific parameters of the tests used:

1 - Test validity

The researcher used the differentiation validity method to calculate the validity of the tests under investigation, by applying the tests to two different groups of gymnasts. The first group is not distinguished from the low-level players and they numbered 6 players, and the second group is distinguished from the high-level players and their number is 6 players from the research community, Then, there is a comparison of the significance of the mean differences between the two groups to identify the validity of the tests under investigation, as shown in Table (3) .

Table (3

Indication of the differences between low-level players and high-level player To calculate the validity of differentiation for the tests in n 1 = n 2 = 12

Variable	Test	Low level		High level		T
		mean	Deviation	mean	Deviation	
Strength	Grip strength	14.333	1.505	9.167	*6.639	*6.639
	Back strength	32.333	3.188	24.833	*3.245	*3.245
	Tensile up	18.833	5.845	12.333	*4.081	*4.081
	Attached (legs raised high)	18.166	2.137	13.333	*4.939	*4.939
	Attached (legs raised high)	38.000	2.529	30.833	*5.301	*5.301

* The tabular "t" value at the level of 0.05 = 2.571

Table (3) shows that there are statistically significant differences at a level of significance 0.05 between the group of high-level gymnasts and the group of low-level gymnasts in the tests under investigation, as the calculated value of "t" is greater than the tabular "t" value at a significance level of 0.05 which indicates the validity of the tests under investigation.

2 - Stability tests :

The researcher used the method of applying the test and then re-applying it to calculate the stability of the tests under investigation on an exploratory sample consisting of (6) players from the pilot study sample. The tests were re-applied on the same exploratory sample two days after the first application, taking into account the standardization of the same measurement conditions. The correlation coefficient was found Between the first and second applications of the pilot sample to calculate the reliability coefficient of the tests under study. The results showed the stability of the test, as shown in Table (3).

Table (4)
Correlation coefficient between the first and second applications of the study sample Scans in the tests being investigated, n = 6

Variable	Test	unit of measure	First application		Second application		Correlation coefficient
			Mean	deviation	Mean	deviation	
Strength	Grip strength	KG	14.333	1.505	14.500	0.894	*0.829
	Back strength	KG	32.333	3.188	29.833	2.695	*0.890
	Tensile up	Rep	18.833	5.845	19.000	6.511	*0.943
	Attached (legs raised high)	Rep	18.166	2.137	18.667	2.338	*0.923
	Attached (legs raised high)	Rep	38.000	2.529	37.333	3.614	*0.909

Value (R) at 0.05 = 0.811 level of significance

Table (4) shows the existence of a statistically significant direct correlation relationship at a level of significance 0.05 between the first and second application of the pilot study sample in the tests under investigation which indicates the stability of the tests.

Sixth: The proposed qualitative training program:

1- Program Objectives:
- Development of physical fitness components of research skills.
- Improving the level of performance of the research enrollment skills.

2- Program design:
The researcher designed the proposed program according to the following:
a- the components of the program are in line with its objective.
b-the components of the training load (intensity - volume - density) for each player, taking into account the individual differences between players in terms of physical fitness.
c- The use of medium intensity in the performance of exercises, as it was from 50% to 60% of the maximum level of a player when performing exercises without tools and using the body as a weight, as well as when using exercises with tools and devices.
d- Variety in the use of different methods of muscle contraction.

3- Time distribution of the program:
The total time for training during the proposed program was determined according to the following:
- The number of weeks for the proposed specific training program: (8) weeks, by two months.
- The number of training units for all devices per week (6 devices) x 5 units.
- The number of devices that are trained on in the training unit = three devices
The training unit time = 240 minutes, which is divided as the following:

Initialize and warm up = 45 minutes.	First device = 45 minutes.	Second device = 45 minutes.
Third device = 45 minutes		Special physical = 60 minutes.

- The training time on the parallel device during the program period is calculated as the following:
* The time for skill training on the device (45 s) x the number of days to train the device per week (3) x the number of weeks (8) = 45 x 3 x 8 = 1080 minutes.
* The time of physical training on the device = 60 s per the number of devices (6) = 10 s in the training unit.
* The time for specific exercises (physical - skill) was distributed on the time for the program.

4- Proposed program:
 - Pre-measurements were made on 1/9/2020 AD.

- The proposed program was implemented from 9/2 to 2/11/2020 for a period of 8 weeks.

- Dimensional measurements were made on 3/11/2020 AD.

5 - Statistical treatments:

To achieve the research objectives, the following statistical methods were used:

Arithmetic mean - standard deviation - torsion factor - T-test - correlation coefficient - improvement ratios).

Presentation and discussion of results:

Presentation of the results of the first hypothesis:

Table (5)
Significance of differences between the pre and post measurements of the experimental group In the physical and skill variables under investigation n = 6

Variables	Tests	unit of measure	Pre - Measure		Post - Measure		T
			Mean	deviation	Mean	deviation	
Muscle strength level	Grip strength	KG	14.333	1.505	22.666	1.505	*12.5
	Back strength	KG	32.333	3.188	45.667	2.823	*31.62
	Tensile up	Rep	18.833	5.845	31.000	6.229	*20.24
	Attached (legs raised high)	Rep	18.166	2.137	30.666	2.943	*22.21
	Attached (legs raised high)	Rep	38.000	2.529	56.166	5.913	*7.56
Skills	Stability in the foothold corner in an "L" shape	second	5	0.836	92.20	1.921	14.28*
	Handstand (stability)	second	14.40	0.707	18	0.838	9.839*
	Handstand from a "V" shape	second	5	0.707	9	1.22	6.325*

The tabular" t "value is at 0.05 = 2.571

Table (5) shows that there are statistically significant differences between the pre and post measurements of the experimental group in the physical and skill variables under investigation in favor of the post measurement at a significance level of 0.05, since the calculated value of" t "is greater than the tabular value of T .

Table (6)
Significance of the differences between the pre and post measurements of the control group In the physical and skill variables under investigation n = 6

Variables	Tests	unit of measure	Pre - Measure		Post - Measure		T
			Mean	deviation	Mean	deviation	
Muscle strength level	Grip strength	KG	14.000	2.097	15.333	2.251	*6.325
	Back strength	KG	31.833	5.698	34.000	5.558	*10.277
	Tensile up	Rep	15.666	4.274	17.833	4.446	*7.050
	Attached (legs raised high)	Rep	عدد	19.000	2.190	22.167	2.927

Follow Table (6)
Significance of the differences between the pre and post measurements of the
control group In the physical and skill variables under investigation n = 6

Variables	Tests	unit of measure	Pre - Measure		Post - Measure		T
			Mean	deviation	Mean	deviation	
	Attached (legs raised high)	Rep	35.166	2.316	41.500	1.378	*6.405
Skills	Stability in the foothold corner in an "L" shape	second	74.600	1.140	81.20	0.836	10.436*
	Handstand (stability)	second	14.200	0.447	16	0.707	4.811*
	Handstand from a "V" shape	second	6	1.815	7	1.141	1.054*

The tabular" t" value is at 0.05 = 2.571

Table (6) shows that there are statistically significant differences between the pre and post measurements of the control group in the physical and skill variables under investigation in favor of the post measurement at a significance level of 0.05, since the calculated value of" t" is greater than the tabular value of" t".

Discussing the results of the first hypothesis: -

The results of the research showed the aim of the study, which refers to the attempt to identify the effect of a specific training program to improve the level of muscle strength and some skills on the parallel device of the experimental group. The results are shown in Table (4) in comparing the pre-measurements with the dimensional measurements of the experimental group in the level of muscle strength and some skills on the device Parallelism. This confirms the existence of statistically significant differences at the level of (0.05) between the mean of the two measurements (pre-post) of the experimental group in the level of muscle strength and some skills on the parallel apparatus and in favor of the post measurement.

The researcher attributes this difference to the effect of the training program on the experimental group. This result is in agreement with the results of the study of Osama Ezz Al-Rijal (2008) (14), Ibrahim Diab (2008) (7) and Ahmed Jundi (1995) (4) that the development of a standardized training program leads to the development and improvement of the level of muscle strength and some skills on the parallel apparatus and the occurrence of differences between the pre-measurement and the post-measurement of the experimental group and in favor of the post-measurement.

Table (4) indicates that significant progress in the level of muscle strength of the experimental group. The results indicate a significant improvement between the pre and post measurements in favor of the post-measurement of the members of the experimental group. The researcher attributes this incident to the effect of the specific training program applied to the experimental group.

Table (4) also shows the occurrence of a significant improvement in the skill variables under study (the support of the letter L on the parallel - the standing on the hands (stability) - the standing on the hands from the position of the letter V) between the pre and post measurements in favor of the post measurement of the members of the experimental group. The researcher returns this progress to the high level of muscle strength of all kinds (maximum strength- strength endurance) among the members of the experimental group due to their impact on the proposed program for the development of strength of all kinds.

Table (5) indicates a significant improvement between the pre and post measurements in favor of the post measurement in the physical variables under investigation (maximum strength, strength endurance) for the control group. The results indicate the emergence of significant differences between the pre and post measurements in favor of the post measurement for members of the control group. The researcher attributes this incident progress to the effect of the traditional program applied on the control group members.

Table (5) also indicates the existence of significant differences between the two pre and post measurements in favor of the post measurement of the members of the control group in the skill variables (leaning the letter L on the parallel - relying a V letter on the parallel - standing on the hands from a V-shape on the parallel). The researcher returns this for the traditional program applied to the control group.

Thus, the first hypothesis is fulfilled, which states: "There are statistically significant differences between the two measurements (pre-post) in the level of muscle strength and skill performance level for both the experimental and control group and in favor of the post measurement."

Presentation and discussion of the results of the second hypothesis:

Table (7)
The percentage of improvement for the experimental and control groups
In the physical and skill variables under investigation

Variables	Tests	unit of measure	Experimental group	Control group	The difference is in the percentage improvement
			Improvement percentage	Improvement percentage	
Muscle strength level	Grip strength	KG	٪58.139	٪9.523	٪48.616
	Back strength	KG	٪41.237	٪6.806	٪34.431
	Tensile up	Rep	٪64.602	٪13.830	٪50.772
	Attached (legs raised high)	Rep	٪47.807	٪18.009	٪29.798

Follow Table (7)
The percentage of improvement for the experimental and control groups
In the physical and skill variables under investigation

Variables	Tests	unit of measure	Experimental group	Control group	The difference is in the percentage improvement
			Improvement percentage	Improvement percentage	
	Attached (legs raised high)	Rep	٪68.807	٪16.667	٪52.141
Skills	Stability in the foothold corner in an "L" shape	second	٪48.095	٪18.699	٪15.159
	Handstand (stability)	second	٪57.278	٪15.748	٪20.507
	Handstand from a "V" shape	second	٪53.036	٪12.213	٪20.486

It is evident from Table (7) that the rate of improvement between the pre and post measurements of the experimental group is higher than the rate of improvement of the control group in all the variables under consideration, and the highest rate of improvement reached 48.616% of the members of the experimental group .

Discussing the results of the second hypothesis: -

The results of Table (6) indicate that the experimental group improved by a better rate than the control group in the physical and skill variables under study. As for the maximum strength of the grip, it is noticed that the percentage of improvement in the experimental group was 58.139% while it reached 9.523% in the control group. Maximum steady back muscle strength was 41.237% for the experimental group, while it was 6.806% for the control group.

And the rate of improvement in the variable related to raising the two legs was 47.807% for the experimental group, while it reached 18.009% for the control group, and the rate of improvement in the variable tension upward reached 64.602% for the experimental group, while it reached 13.830% for the control group, and the percentage of improvement in the variable oblique extension flexion of the arms reached 68.807% for the experimental group, while 16.667% for the control group.

It is noted from a comparison of the improvement rates for the experimental and control groups that the experimental group has increased the level of its physical fitness components by a greater percentage than the control group. The researcher attributes this to the training program applied to the experimental group using specific training that improves

muscle strength and the effectiveness of skill performance to a greater degree .That's because the qualitative works raise the strength levels of gymnasts under 10 years of age, which raises the level of skill performance, especially for skills that depend on strength of all kinds.

The results of Table (7) also revealed that the experimental group had improved by a better rate than the control group in the skill variables under investigation. The improvement in the skill of building the letter L on the parallel was 48.095% for the experimental group and it reached 18.699% for the control group. Handstand skill (stability) 57.278% for the experimental group and it reached 15.748% for the control group, while the amount of improvement in handstand skill from building a letter V on the parallel was 53.036% for the experimental group and it reached 12.213% for the control group.

It is noted from a comparison of improvement rates for the experimental group and the control group that the experimental group has increased the rate of improvement in skill performance by a greater rate than the control group. The researcher attributes this to the training program applied to the experimental group, which indicates that the specific training of gymnasts under 10 years works to improve Skillful performance of gymnastic skills under study. The results of the current study agree with the previous studies that were available to the researcher, especially those with an experimental nature (5) (6) (7) (14) (15), which concluded in

its results that there is almost agreement on the effectiveness of the standardized programs. "Izzat Al-Kashef" (1987 AD) and Ahmad Al-Jundi (1995 AD) believe that muscle strength is the most important physical characteristic of a gymnast. Studies have shown a direct relationship between athletic results and the level of muscle strength growth in a gymnast.

Conclusions :
1. The specific training program contributes to improving some physical characteristics that help in improving the performance of the parallel system for players under 10 years old.
2. The specific training program leads to a higher level of performance of the motor sentence on a parallel device for players under 10 years old .

Recommendations :
1- When developing a specific training program, the trainer should pay attention to:
• The form of the ideal performance and the critical technical stages of performance.
-     The development of working and corresponding muscles in the sense of balance in the development of muscle groups for skill performance.
• Taking into account the individual differences between players.
2- Conducting similar research in the skills that the trainer finds difficult to teach and upgrade them.
3- Taking advantage of experts in the field of gymnastics in developing programs, whether educational (educational steps for each skill) or training, and what they include in terms of legalizing the training load and modern methods of training.

4 _ The researcher recommends that the Egyptian Gymnastics Federation, in partnership with the Faculties of Physical Education, organize courses for coaches and devotes Gymnastics Training department according to the principles and rules of specific training programs .

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