Effectiveness of Agility Ladder Drills on Some Physical Variables and the Level of Technical Performance of some Dismounts on High Bar Apparatus in Gymnastics

Dr / Shady Mohamad Al henawy

Faculty of Physical Education – Mansoura University

1/0 Introduction and Research Problem:

Gymnast is obliged to perform the mandatory on high bar apparatus, which is defined by law, which includes elements of performance evaluation (performance - composition - difficulty), as well as performance enhancements related to the concepts of (risk - innovation and creativity), whose grades are added to the player whose mobility sentence includes any skill expressive of that Concepts.

Atilgan, Oya Erkut (2013) believes that gymnastics requires a wide variety of dynamic and static skills, with frequent changes in body position with control of the body in the air and against gravity, in addition to some gymnastics skills whose performance requires static balance.(23:16)

Adel Abdul-Basir (2007) notes that the technical sentence on the mind machine is characterized by the skill of the major circle, which it is familiar to perform as a skill preceding most of the kinetic ends on the mind device, whose performance is characterized by the movement of the player's body from the maximum energy placed above the rotation point to the maximum movement energy below the rotation axis and from there The kinematic ends are performed, through a flying stage in which the player leaves the device to carry out the required kinetic duty, then the decline, balance and stability on the falling level. (9: 6)

Haitham Adel Abdel-Basir (2011) (18) adds that the gymnast's ability to maintain his balance requires reactions from within the body that affect and are affected by each other, as the balance is achieved as a result of the compatibility between the activities of complex groups of vital devices that are given a mechanism of uniform action, and the visual senses are inseparable from them Hearing and touching.

The Technical Committee for Men (2015) indicates that if the player falls or fails to land on the feet, the training requirement is canceled and the difficulty is not counted within the elements of the kinematic system, and that instability in the landing such as vibration or step in any direction or deviation from the landing line leads to Discounts that adversely affect the total final score (5: 131)

Haider Abdul-Razzaq et al. (2016) (7) explain that the performance requirements of the Al-Okla device are characterized by continuity and diversification of skills between weightings,

major rotations, cup movements, flight movements and re-arrest to perform a kinetic chain that ends in decline.

Yahya Zakaria and Hazem Abdullah (2002) (20) state that mastery of basic landing moves can provide the player with a solid foundation to teach more complex and higher landing movements which increases the skill level.

Mohamed Shehata (2003) emphasizes that the player's ability to balance is one of the most important physical characteristics needed to master motor skills, as the player's loss of balance during any technical stage of the skill will lead to a malfunction in the implementation of the required motor duty. (13: 249)

Essam Abdel-Khalek (2003) indicates that balance is a necessary kinetic ability to accomplish the correct motor performance, in addition to that it is considered one of the complex functions of the body, and the importance of kinematic balance is due to the fact that it helps the body to hold together and avoid falling as well as achieving muscle sufficiency and individual control in its proper kinematic directions. The ability to balance, whether fixed or kinetic, depends on the compatibility of the functions of the balance-keeping apparatus, the movement sensations in the muscles, tendons and joints and the visual perception thereof through the various sensory systems of the body (12: 123).

Ahmed Al-Shazly (2009) adds that balance is the vital compatibility of the reflexive reactions of the human body with the cognitive field and the organic and functional systems in following up the center of gravity on its line of action against gravity to fall in the middle of the base of the anchor during stability and movement. (3: 128)

This was confirmed by **Adel Abdel-Basir (2008)** on the importance of exercises related to balance and similar to the pattern of artistic performance in gymnastics, as it is used to develop and develop the correct kinematic path of technical skills. (10: 115)

The researcher's review of the studies related to gymnastics, which he was able to reach, found that some of them addressed the effect of using agility ladder exercises on some acrobatic skills, while the researcher noticed a scarcity in the study of the impermanence of the moment of landing skills on the end device, which requires the necessity of conducting an experimental study as an attempt to treat Deficiencies, and improving the player's ability to control the position of the body and maintain its balance in the landing stage, which is an integral part of the motor end skill, which prompted the researcher to conduct this study as it is an important input to master some of the basic motor end skills on the mind machine.

Through the training of **the researcher** for the gymnastics team in the Qassim region in the Kingdom of Saudi Arabia, the researcher noticed a deficiency in the level of technical performance of some of the motor endings on the mind device in gymnastics, where the researcher found most of the players depend on the performance of the skill of the major circle before being freed from the mind and flying to perform the basic technical stage of the endings Mobility, taking advantage of the resulting movement energy to obtain the flight path and then spin and wind around more than one axis of movement, before landing on the landing ranks, from here the research problem emerged, where the researcher noticed a different imbalance in the ability of players to balance

after landing, and therefore not The player’s ability to hold as required, which negatively affects the players ’scores during competitions,Where the discounts on the formal errors of performance range between (0.1 - 0.3 - 0.5) of the degree depending on the type of error, and the opponent may reach the (1 full degree) in the event that the player loses his balance and falls during the implementation of the landing phase of the motor end skill on the mind device, so the player maintains On his balance and stability during landing is an integral part of the skills of the motor ends, and the researcher has noted the repetition of technical errors when the players try to perform some of the motor ends on the apparatus of the mind, including the technical skills under consideration, and this was shown through competitive evaluation positions and also during competitions, which It negatively affected the players ’scores, and the researcher assumes that this problem is due to the inability of the players to balance and maintain the correct body position when landing, which affects the level of performance of the motor ends on the mind device under consideration.

The researcher believes that one of the requirements for performing this type of skill is the player's ability to maintain the dynamic and static balance, because of its importance in carrying out the motor duty in the required form, as the player maintains his balance the stage of the skills of the motor ends is a basic criterion in evaluating the level of technical performance, so The fitness ladder exercises are one of the effective means to develop the player's ability to control his body positions and maintain his static and dynamic balance.

Therefore**, the researcher** resorted to designing and applying a group of exercises using the fitness ladder, to treat formal and technical errors of performance in order to develop the technical level of players, and thus raise their ranks on the mind machine, and it may serve as the legal scientific reference that can be relied upon by workers in the field of gymnastics training.

1/1 **Research Goals:**

Identify the effectiveness of agility ladder drills on some physical variables and the level of technical performance of some dismounts on high bar apparatus for members of the research sample through:

1/1/1 Developing the level of some physical variables for the individuals in the sample understudy.

1/1/2 Developing the level of technical performance of some dismounts on on high bar apparatus understudy.

1/2 **Research Hypothesis:**

1/2/1 There are statistically significant differences between the pre and post measurements of the experimental group in the physical variables understudy in favor of the post measurement.

1/2/2 There are statistically significant differences between the pre and post measurements of the experimental group in the level of technical performance of some dismounts on high bar apparatus understudy in favor of the post measurement.

1/3 **Research Terms:**

1/3/1 Balance

Muhammad Hassanein (2010) indicates that balance is: the player's ability to control his body during stability and movement, and balance is divided into two types:

Static Balance is the ability of an individual to maintain his balance and control his body in a steady state such as standing on one foot and taking the position of balance.
Dynamic balance is the ability of an individual to control his body during kinetic performance, such as walking on a balance beam. (15: 26)

1/3/2 Agility Ladder

It is a multi-purpose auxiliary training tool, in the form of a ground ladder made of nylon, that can be used to develop agility, transitional speed, mobility, and muscular ability as well as consistent and kinetic balance on two feet or one foot, through running, jumping, and part-time skills (procedural definition).

1/3/3 Dismounts Movement

It is the final skill in which the player concludes his technical sentence, and all the motor ends on the various gymnastics end up landing on the landing and steady level (2nd), which reflects the importance of the player's ability to balance and move (procedural definition).

2/0 **Research Procedures:**

2/1 **Research Methodology:**

The researcher used the experimental method using the experimental design of one group and by making the two measurements (pre-post).

2/2 **Spatial Domain:** gymnastics hall - halls complex at Qassim University - Buraidah City - Kingdom of Saudi Arabia.
2/3 **Time Domain:** The exploratory study was conducted in the time period from Sunday 29/12/2019 to Thursday 2/1/2020. and the pre-measurement was conducted on Saturday 4/1/2020. The basic study was carried out during the period from Sunday, 5/1/2020 until Thursday, 27/2/2020. The post-measurement was performed on Saturday, 29/2/2020.

2/4 **Research Sample:**

The primary study sample was chosen intentionally by gymnastics team players at the Qaseem University, and the sample included (10) players, as well as (2) players to conduct the exploratory study in order to select the appropriate agility ladder drills related to the technical skills understudy, and codify the training load for these drills.

2 /4/1 **Statistical description of sample**

Table (1)
Statistical description of growth rates variables
(Height - Weight - Age - Training Age)
(n=10)

		Statistical data Variables	measuring unit	Mean	standard deviation	Median	Coefficient of torsion
Growth rates	1	Tall	cm	169.9	3.87	168	1.472
	2	Weight	Kg	66.2	2.82	65	1.276

	3	Age	Year	17.08	0.55	16.85	1.237
	4	Training age	Year	5.53	1.21	5.15	0.935

From Table (1) it is clear that the values of the torsion coefficient for each of the variables (growth rates) understudy ranged between (1.472 , 0.935) and these values were limited between (±3) which indicates the moderation of the values of the growth rates of the individuals in the sample understudy before experimenting.

Table (2)
Statistical description of physical variables
(n = 10)

Physical Variables	Test	measuring unit	Mean	standard deviation	Median	Coefficient of torsion
Static Balance	Stork Stand	second	8.67	1.07	8.25	1.176
Dynamic Balance	Bass Test	degree	70.5	7.97	72.5	-0.752
Agility	Zigzag Run	second	6.9	0.51	6.905	-0.029

From Table (2) it is clear that the values of the torsional coefficient for each of the physical variables understudy ranged between (- 0.752 , 1.176) and that these values were limited between (±3) which indicates the moderation of the values for the physical variables of the sample individuals understudy before experimenting.

Table (3)
Statistical description of technical performance variables
(n = 10)

Technical Performance Variables	measuring unit	Mean	standard deviation	Median	Coefficient of torsion
Back Somersault Tucked	degree	6.32	0.758	6.15	0.672
Back Somersault Piked	degree	6.51	0.570	6.45	0.315
Back Somersault Stretched	degree	6.31	0.757	6.25	0.237

From Table (3) it is clear that the values of the torsion coefficient for each of the variables (the level of technical performance) understudy ranged between (0.237 , 0.672) and these values

were limited between (±3) which indicates the moderation of the values of technical performance of the individuals of the sample individuals understudy before experimenting.

2/5 Means of data collection:

The researcher used the following methods to collect data:

2/5/1 The means of collecting data related to physical variables

2/5/2 The means of collecting anthropometric data.

2/5/3 The means of collecting technical performance level data understudy.

2/5/1 The means of collecting data on the physical variables understudy:

Physical Variables Tests understudy attachment (5)

- Stork Stand, for stable balance.
- Modified Bass Test of Dynamic Balance
- Agility Test, Zigzag Run

2/5/2 Anthropometric data collection methods:

The means and tools for data collection that are appropriate to the nature of the study were identified by looking at the scientific references, research and previous studies in the field of gymnastics training and some other sports. The researcher has used the following tests, measures and devices:

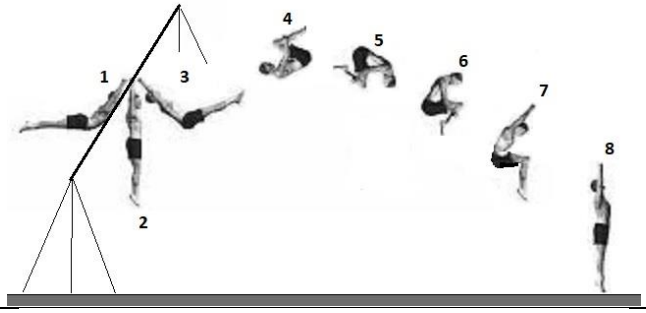
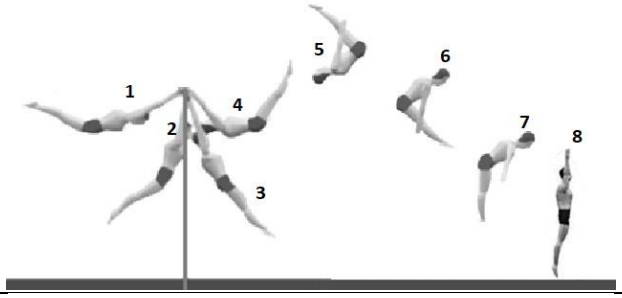
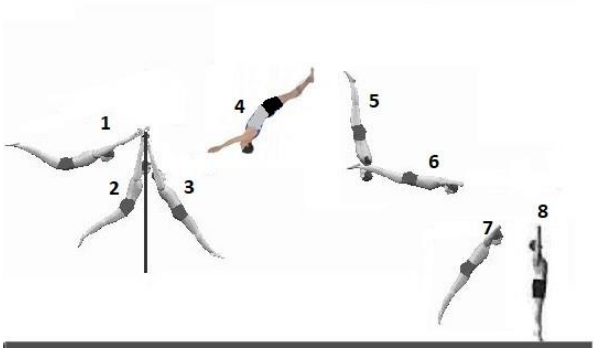
- A rest-meter device for measuring the total length of the body up to the nearest 1 cm.
- The medical scale device to measure the student's weight up to the nearest 1 kg.

2/5/3 Means of collecting data on the technical performance level of the skills understudy:

The technical skills understudy were filmed using the "video camera" and the videos were shown to four arbitrators accredited by the Egyptian Gymnastics Federation to evaluate the technical performance of the skills understudy, where each rule monitored a score of ten degrees for each technical skill of the high bar apparatus understudy, and was deleted The highest and lowest score for a player's score is the average of the two middles.

In this regard, **Mohamed Hassanein (2010)** and **Mohamed Khalil (2018)** indicate that the Subjective Evaluation is the type of evaluation that does not depend on the standards, levels, and criteria, but depends on the experiences of the measurers (arbitrators), and the legal evaluation is used in many Of sports activities, especially gymnastics, diving, rhythmic gymnastics and water ballet, where uniform international legal conditions are established, agreed upon in advance between the arbitrators, so that the greatest degree of objectivity can be reached in assessing the degree. (15: 42), (14: 9).

Table (4)
Technical skills understudy

s	Arrangement	The skills of the high bar apparatus understudy	
1	Skill 1	*Back Somersault Tucked*	
2	Skill 2	*Back Somersault Piked*	
3	Skill 3	*Back Somersault Stretched*	

2/6 **Selecting the assistants**:
A number of (2) assistants from the Department of Physical Education and Kinesiology were chosen to assist the researcher in applying the study procedures.

2/7 **The Exploratory Study:**
The researcher conducted the exploratory study in the time period from Sunday 29/12/2019 to Thursday 2/1/2020, based on a sample of the players represented by the original community and from outside the basic research sample. They numbered (2) players who were chosen in a random manner. Tribal measurement on Saturday, 4/1/2020.

This study has targeted:

- Ensure the safety of the devices and tools used
- Discovering and handling difficulties while making measurements.
- Training assistants to take measurements and ensure that tests are applied according to the specified conditions
- Selecting and experimenting with agility ladder exercises and their suitability for the technical skills understudy.
- Legalization of training load variables for agility ladder exercises under consideration
- Adjust the best angle of shooting with the camera to facilitate the process of assessing the technical performance of the skills understudy.

The Exploratory Study resulted in:
Ensure that all of its objectives are achieved, and that the proposed drills understudy are appropriate to the nature of the age stage, whereby the survey sample members conducted the proposed fitness scale exercises without any difficulties, which provided the researcher with the ability to apply these exercises to the members of the basic research sample.

2/8 Basics of design the program
Suggested agility ladder drills:
The researcher applied a set of fitness ladder exercises attached (6) that are compatible with the motor paths of some of the motor ends on the mind device under discussion, and the researcher took into account the formulation of exercises to reach the best training method in terms of similarity of the muscular work in those exercises with the basic muscular work of the skills The exercises were divided into:
1- Training on the ability to change direction.
2- Special exercises to maintain the center of gravity of the body, halfway between the feet.
3- Training for static and dynamic balance.
4- Training to increase the feeling of the soles of the foot.

• Training load variables for the proposed agility ladder drills:
The researcher has codified the training load variables for the proposed fitness ladder exercises by reviewing previous and related studies, specialized references, sports training science references and the international information network. Attachment (7)

2/9 **Basic study:**

The basic study was carried out during the period from Sunday 5/1/2020 until Thursday 27/2/2020, and the post measurement was carried out on Saturday, 29/2/2020, and the pre and post skill skills were photographed at the gymnasium headquarters in the halls complex of Sports in Qassim University. As shown in the attached schedule (8).

2/10 **Statistical Treatments:**

The researcher used the program (Statistical Package for Social Sciences) (SPSS v25)
Using the following statistical parameters:

- SMA. Standard Deviation - Median
- Torsional coefficient – Wilcoxon test - Percentage of improvement.

3/0 **Presentation and discussion of the results:**

3/1 Present the results:

3/1/1 Presenting the results of the first hypothesis:

Table (8)

Significance of the differences between the pre and post measurements for the experimental group in the physical variables

N = 10

Physical Variables	Test	Pre mean	Post mean	Positive ranks		Negative ranks		(Z) Value
				mean rank	Sum of ranks	mean rank	Sum of ranks	
Static Balance	Stork Stand	8.67	11.20	5.5	55.0	0.00	0.00	-2.809*
Dynamic Balance	Bass Test	70.50	95.00	5.5	55.0	0.00	0.00	-2.825*
Agility	Zigzag Run	6.90	4.99	0.00	0.00	5.5	55.0	-2.805*

***** Tabular value (Z) at the level of 0.05 = $\pm$ 1.96

From Table (8) it is clear that the calculated value of (Z) for each of the physical variables understudy has ranged between (- 2.805 , - 2.825) and these values are not limited to($\pm$ 1.96) which indicates the presence of statistically significant differences. between the mean of the pre-post measurements of the experimental group in favor of the post measurement at the level of significance (0.05) in the physical variables understudy.

Figure (1)

Significance of the differences between the pre and post measurements for the experimental group in the physical variables

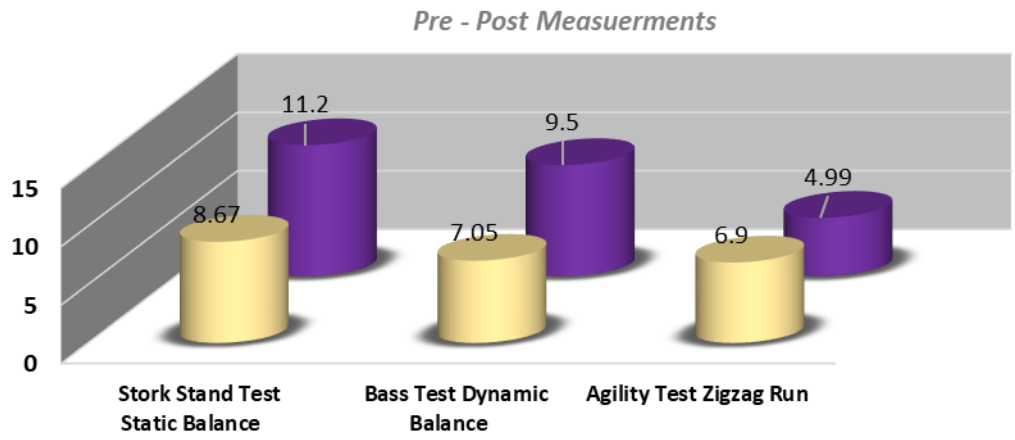
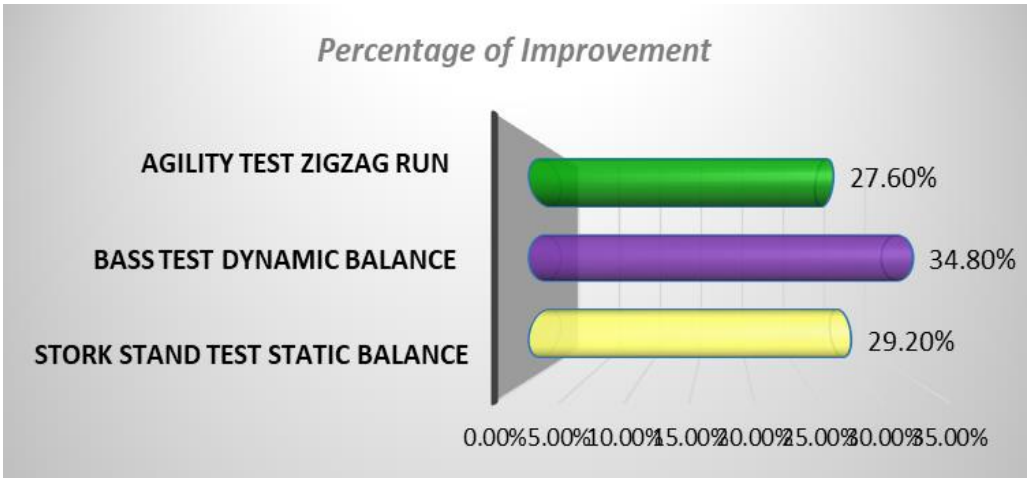


Table (9):
The percentage improvement of the experimental group In the physical variables understudy

Physical Variables	Test	Pre mean	Post mean	Difference between the two Means	Percentage of improvement
Static Balance	Stork Stand	8.67	11.20	2.53	29.2%
Dynamic Balance	Bass Test	70.50	95.00	24.50	34.8%
Agility	Zigzag Run	6.90	4.99	-1.90	27.6%

From Table (9) it is clear that the percentage of improvement of the experimental group in the physical variables understudy ranged between (27.6% , 34.8%) and the highest percentage of improvement was bass test of (34.8%) and the lowest percentage of improvement was for agility zigzag run by (27.6%) and the stork stand test ranged between them with percentage of improvement of (29.2%).

Figure (2)
The percentage improvement in the physical variables understudy



3/2/2 **Presenting the results of the second hypothesis:**

Table (10)
Significance of the differences between the pre and post measurements for the experimental group in the technical performance variables
n = 10

Technical Performance Variables	Pre mean	Post mean	Positive ranks		Negative ranks		(Z) Value
			mean rank	Sum of ranks	mean rank	Sum of ranks	
Back Somersault Tucked	6.32	7.99	5.5	55.0	0.00	0.00	-2.803
Back Somersault Piked	6.51	8.06	5.5	55.0	0.00	0.00	-2.814
Back Somersault Stretched	6.31	7.53	5.5	55.0	0.00	0.00	-2.807

* Tabular value (Z) at the level of 0.05 = $\pm$ 1.96

From Table No. (10) it is clear that the calculated value of (Z) for each of the technical performance variables understudy ranged between (- 2.803 , - 2.814) and these values are not

limited to(± 1.96), which indicates that there are statistically significant differences between the mean of the pre-post measurements of the experimental group in favor of the post measurement at the level of significance (0.05) in the technical performance variables.

Figure (3)
Significance of the differences between the pre and post measurements for the experimental group in technical performance variables

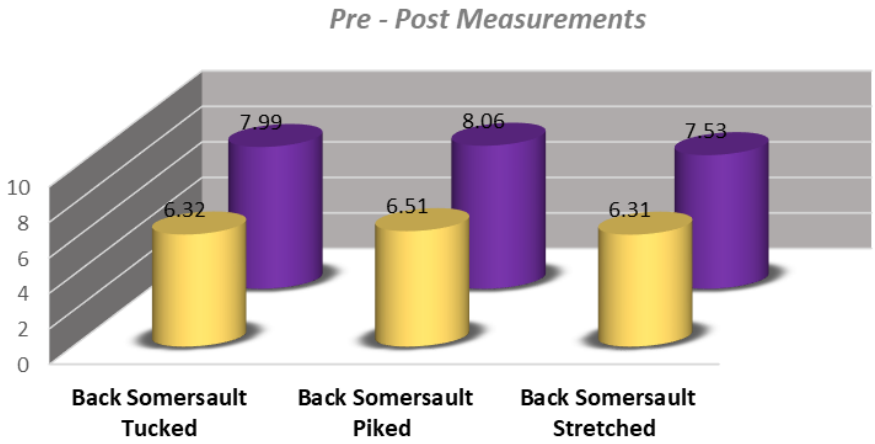
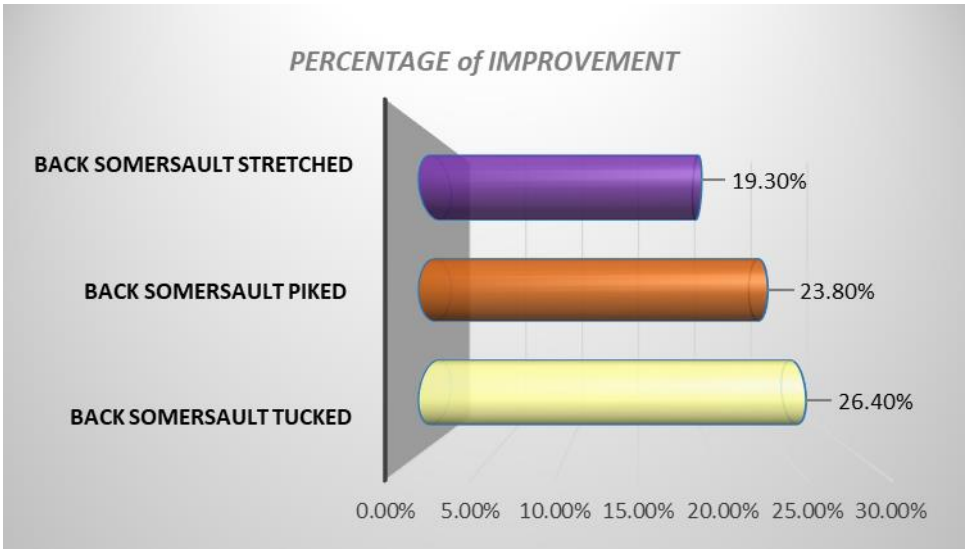


Table (11)
The percentage improvement of the experimental group In technical performance variables

Technical Performance Variables	Pre mean	Post mean	Difference between the two Means	Percentage of improvement
Back Somersault Tucked	6.32	7.99	1.67	26.4%
Back Somersault Piked	6.51	8.06	1.55	23.8%
Back Somersault Stretched	6.31	7.53	1.22	19.3%

From Table (11) it is clear that the percentage of improvement of the experimental group in the variables of technical performance ranged between (19.3% , 23.8%) and the highest percentage improvement was Back Somersault Tucked with (23.8%) and the lowest percentage improvement was Back Somersault Stretched with (19.3%) and Back Somersault Piked ranged between them with (26.4%) .

Figure (4)
The percentage improvement in variables of technical performance



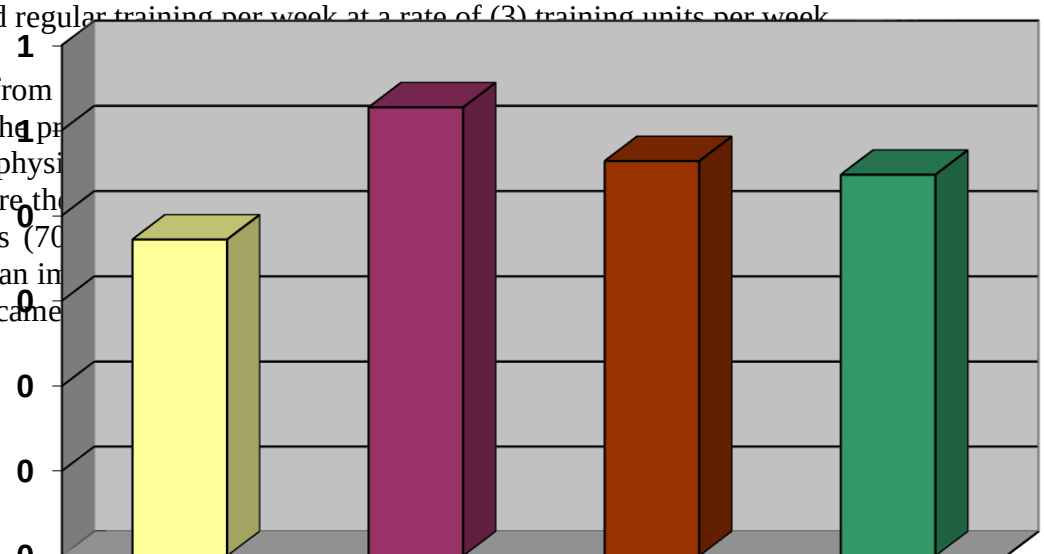
2/2 **Discuss the results:**

3/2/1 **Discussing the results of the first hypothesis:**

Which states, "There are statistically significant differences between the pre and post measurements of the experimental group in the physical variables understudy in favor of the post measurement."

It is clear from Table No. (8) and Figure No. (1) that there are statistically significant differences at the level of (0.05) between the pre and post measurements of the experimental group in favor of the post-measurement in the physical variables under consideration, where the value of the (Z) table at the level of 0.05 = (+ 1.96)), While the calculated value of (Z) for each of the physical variables under discussion ranged between (- 2.805, - 2.825) and that all these values are less than (-1.96) meaning that they are not limited to + 1.96, which indicates that there are statistically significant differences between averages of pre-post measurements of the experimental group in favor of post measurement at the level of significance (0.05) in the variables of the physical variables understudy. The researcher attributes these results to the effect of agility ladder drills used, and regular training per week at a rate of (3) training units per week

It is also clear from
differences between the pr
measurement in the physi
(27.6%, 34.8%), where th
pre-measurement was (70
(95.00 degrees) with an in
measurement and became



average score for the agility test of zigzag running in the pre-measurement (6.90 second) and decreased in post-measurement and became (4.99 second) with an improvement (27.6%).

The **researcher** attributes the positive impact on the physical variables understudy (Stork Stand Test, the Bass Test, the Zigzag Running Agility Test) to the Agility ladder Drills followed, during the design of the exercises, the researcher took into account the diversity of muscle work trends, and the employment of physical variables in the tracks Kinetics of the technical skills under discussion, which clearly contributed to the high level of static and dynamic balance of the individuals in the research sample.

These results are consistent with the results of studies by **Adi Hidayat (2019)** (21), **Andrew Shim et al (2019)** (22), **Robert SK NG et al (2017)** (30), **Heng Choon Meng et al (2014)** (26), That the use of agility ladder drills improves static and dynamic balance tests.

These results are also consistent with the results of studies by **Nanda Eriko et al (2018)** (29), **Susilaturochman et al (2017)** (31) in the ability of agility ladder exercises to develop a player's ability to control his body during different situations.

This was confirmed by **Wathiq Obaid et al. (2016)** (19) that there is a direct correlation between the level of agility and the player's ability to have a stayic and dynamic balance.

Based on the foregoing results, the first hypothesis that states: "There are statistically significant differences between the pre and post measurements of the experimental group in the physical variables understudy in favor of the post measurement."

3/2/2 **Discussing the results of the second hypothesis:**

Which states, "There are statistically significant differences between the pre and post measurements of the experimental group in the level of technical performance of some dismounts on high bar apparatus in gymnastics understudy in favor of the post measurement."

It is clear from Table No. (10) and Figure No. (3) that there are statistically significant differences at the level (0.05) between the pre and post measurements of the experimental group in favor of the post measurement in the level of technical performance of some dismounts on high bar apparatus in gymnastics understudy, where the value of (Z) tabular At the significance level 0.05 = (+ 1.96), while the calculated value of (Z) for each of the technical performance variables understudy ranged between (- 2.803, - 2.814) and that these values are all less than (-1.96) in the sense that they are not limited to ($\pm$ 1.96) which Indicates the presence of statistically significant differences between the averages of the pre-post measurements of the experimental group in favor of the post measurement at the level of significance (0.05) in the technical performance variables for some dismounts on high bar apparatus in gymnastics understudy.

It is also clear from Table No. (11) and Figure No. (4) that there are statistically significant differences between the pre and post measurements of the experimental group in favor of post measurement in the level of technical performance of some dismounts on high bar apparatus in

gymnastics understudy, with an improvement rate ranging between (19.3%, 26.4%) , Where the average degree of skill (Back Somersault Tucked) in the pre measurement was (6.32 degrees) and became in the post measurement (7.99 degrees) with an improvement rate is the highest by (26.4%), and in the second place was the average skill degree (Back Somersault Piked) in Pre-measurement (6.51 degrees) and became in post-measurement (8.06 degrees) with an improvement (23.8%), and in third place was the average skill score (Back Somersault Stretched) in pre-measurement (6.31 degrees) and became in post-measurement (7.53 degrees) with an improvement rate (19.3%).

The researcher attributes the level of improvement in the variables of the level of technical performance of the skills for some dismounts on high bar apparatus in gymnastics understudy to the positive impact of the agility ladder drills followed as shown in an attachment (6) where the researcher took into account during the design of drills the diversity of muscle work tracks, and the employment of physical variables in the dynamic paths of technical skills understudy, which clearly contributed to the development of the skill level of the members of the research sample. And by different significant improvement rates, the best of which was in favor of the skill ((Back Somersault Tucked) with an improvement rate which is the highest by (26.4%).

These results are consistent with the results of the studies of **Jose Afonso, et al (2020)** (28), **Fotiadou, Eleni G et al (2016)** (25), **Ivan Cuk, et al (2013)** (27), **Eadric Bressel, et al (2007)** (24), that the skill performance has improved significantly due to the improvement in the level of static and dynamic balance resulting from the use of agility ladder as it made players more control of different parts of the body during the kinetic duty and during stability after completion, which contributed significantly to the development the performance.

In this regard, the results of the studies of **Mushira Al-Ajmi (2016)** (16), **Hussein Abdel-Younis (2015)** (6), **Zakaria Shehata (2013)** (8), **Maan Jassem and others (2010)** (17) emphasized the importance of the role of balance Static and dynamic level in the technical performance of landing skills on gymnastics.

Based on the above results, it is clear that the proposed agility ladder drills have a positive effect on the level of technical performance of some dismounts on high bar apparatus in gymnastics understudy, as they have greatly contributed to improving the player's ability to control different body positions during stability and movement, which helped to mastering the skills of dismounts on high bar apparatus in gymnastics understudy.

Thus, the second hypothesis has been fulfilled, which states: "There are statistically significant differences between the pre and post measurements of the experimental group in the level of technical performance of some dismounts on high bar apparatus in gymnastics in favor of the post measurement."

4/0 **Conclusions and Recommendations:**

4/1 **Conclusions:**

Based on what the research results showed, and in light of the research goal and hypotheses, the researcher reached the following conclusions:

4/1/1 The proposed agility ladder drills have a positive effectiveness on some physical variables understudy, through:

4/1/1/1 The percentage of improvement in the physical variables understudy ranged between (27.6% and 34.8%).

4/1/1/2 The average levels of the Bass Test for Dynamic balance in the pre-measurement was (70.50 degrees), and it increased in the post measurement and became (95.00 degrees) with an improvement rate that is the highest by (34.8%).

4/1/1/3 The average of stork stand test scores in the pre-measurement (7.67 second) and the post-measurement rise and became (11.20 second) with an improvement rate (29.2%).

4/1/1/4 The average scores for the agility test of the Zigzag run in the pre-measurement (6.90 second) and decreased in the post-measurement and became (4.99 second) with an improvement rate (27.6%).

4/1/2 The proposed agility ladder drills have a positive effectiveness on the variables of the technical performance level of some dismounts on high bar apparatus understudy, through:

4/1/2/1 The percentage of improvement in the technical performance variables understudy ranged between (19.3% and 26.4%).

4/1/2/2 The average degree of skill (back somersault tucked) in the pre-measurement was (6.32 degrees) and became in the post-measurement (7.99 degrees) with an improvement rate is the highest by (26.4%)

1/4/3/3 The average skill level (Back Somersault Piked) in the pre-measurement (6.51 degrees) and became in the post-measurement (8.06 degrees), with an improvement rate (23.8%)

1/4/2/4 The average degree of skill (Back Somersault Stretched) in the pre-measurement (6.31 degrees) and became in the post-measurement (7.53 degrees), with an improvement rate (19.3%).

4/2 Recommendations:

In light of the results of the research results and the conclusions reached, the researcher recommends the following:

4/2/1 Applying the agility ladder drills to develop the technical performance of some dismounts on high bar apparatus understudy.

4/2/2 The merging of physical and skill training commensurate with the motor tracks of the skills required to be developed with a view to the overall preparation of the player, to reach the highest level of achievement.

4/2/3 Educating the trainers with the importance and how to apply the agility ladder drills, in a way that is compatible with the requirements of technical performance on each gymnastic apparatus.

4/2/4 Applying the agility ladder drills in the skill preparation phase and the competitions period, to make the most of the mastery of some dismounts on high bar apparatus understudy.

4/2/5 Applying the agility ladder drills on the various gymnastics apparatus, and on the other age stages.

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