

The Effects of PNF Exercises by a Special Device of Develop the Hip Joint Flexibility and Perform some Kicking Skills of Young Taekwondo Players

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Abstract

The problem of research focused on increasing the flexibility of the hip joint and measuring it according to advanced scientific standards is important for Taekwondo, which most of the workers in this game did not care, because its skills depend on the opening the legs and any weakness has effects on the motor extent of skills and then be difficult to reach the goal, the research objectives is prepare PNF exercises by using a special device to develop and measure the flexibility of the hip joint, to identify on the effect of these exercises by the device in the development of hip joint flexibility and kicking skills of young Taekwondo players, the researchers hypothesized that there are significant differences in post measurements in the development of hip joint flexibility and kicking skills. The researchers used the experimental method by designing (the two equal groups) and the research population was determined as the young players of Al Furat Al Awsat, number of (45) players and the sample was chosen randomly and number of (16) players, the results in post and pre –measurement were significant differences in the hip joint and motor skills of the experimental group, The post measurement was significant differences in all the studied variables, the researchers concluded that PNF exercises on the used device had a large effect on the development of working muscles of the hip joint, PNF exercises use according to the device which was close from the performance similar to the skills performance under study which helps to develop these skills, the most important recommendations use these exercises in accordance to the used device to develop the hip joint flexibility and the skill performance, diversification and change in exercise performance leads to the development the level.

Keywords: PNF Exercises, Flexibility, Joints, Health.

Introduction

The development of any field of sports science contributes in one way or another to the development of physical education and sports through use of ways, methods and modern scientific techniques in various fields of knowledge as effective means in the process of training, measurement and evaluation to reach the development of the planning and skill aspects of sports⁽¹⁾. Taekwondo game has abundant share of research,

analysis and development at the game level and the player, and it is characterized by the performance nature of the changing and rapid positions, which depends on the motor extent of the joints and this requires effective measurement and this helps to give a clear picture of the players levels, especially when it is based on codified objective tests by new devices⁽²⁾. Hence the importance of research of PNF exercises by using a measuring device to develop the hip joint flexibility and perform some kicking skills that contain in its performance on the joints flexibility.

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The Research Problem:

One of the important things in the Taekwondo game

is to increase the flexibility of the hip joint and measure it according to advanced scientific standards, which most workers did not care about this game, because a lot of game skills depends on the opening the legs and any weakness effects on the motor extent of skills⁽³⁾. It is also possible to measure this joint through a device that measures the angle of flexibility of the hip joint, so researchers tried to study the effect of exercise PNF by a special device to measure the angle and joint flexibility in the development of some skills that are characterized by opening during motor performance⁽⁴⁾.

Research Objectives:

1. Preparation of PNF exercises by a special device to develop and measure the hip joint flexibility.

2 - Identify the effect of exercise by the device in the development of hip joint flexibility of young Taekwondo players.

3 - Identify the effect of exercise in the development of some kicking skills among the young Taekwondo players.

Research hypotheses:

1 - There is a significant difference between the pre and post measurements in the development of hip joint flexibility and kicking skills of young Taekwondo players and in favor of post measurements.

2 - There is a significant difference in the post measurements in the development of the hip joint flexibility of and kicking skills of young Taekwondo players between the two research groups and in favor of the experimental group.

1Research Fields:

1-4-1 **Human field:** Al Fruat Al Awsat Taekwondo players for 2019 season.

1-4-2**Time Field:** 10/2/2019 to 25/8/2019

1-4-3 **Spatial Field:** Taekwondo hall in NajafAlAhraf.

Research methodology and field procedures:

Research Methodology

The researchers used the experimental method to suit the nature of the research problem.

Research population and sample

The research population determined as Al Furat Al Awsat players (total of 45 players),the sample was chosen by simple random number (16) players and the percentage (35%),the parity and homogeneity in the variables(length, mass, age of training, and skills under study) as in tables (1):

Table (1) shows the homogeneity of the variables under study

variables	Measurement unit	S-	Mean	A	Sprains	Significance
Length	CM	165.12	164.3	6.45	0.38	homogeneous
weight	KG	64.67	63.2	5.51	0.80	homogeneous
Age of training	Month	26	25	3.36	0.89	homogeneous

Table 1 shows that the two homogeneous research groups in all variables, the results showed that the sprains coefficient values are between (1±)

Table (2) shows the equivalence of the variables under study

variables	measuring unit	Experimental		Control		Calculated (T) value	Significance level	Type of significance
		S	A	S	A			
Angle of hip flexibility	CM	122.53	11.67	121.07	11.49	1.54	0.09	Non - moral
Apollo Jacky (Vocal solo kick)	Degree	6.14	2.43	12.6	1.23	2.13	0.14	Non - moral
Jikojki (Kick Hammer Front)	Degree	6.47	1.09	6.21	1.16	2.21	0.24	Non - moral
Higujki (Round Kick)	Degree	6.34	1.59	6.13	1.36	1.23	0.17	Non - moral

Tools and Means:

- Test and measurement.
- Statistical means.
- (hip) Joint Flexible device.
- Medical balance.
- stopwatch.
- Unloading and data collection form.
- Computer brand (DEEL).

Main research procedures:**Skills under study:**

Some of attacking skills of legs adopted by the researchers because the importance of these skills in the Taekwondo sport, Hapatolyogki (single-kick Alotawip), Jikojki (front hammer kick), Hijojki (round kick).

Evaluation skills under study:

The researchers evaluate the skills by showing the skills to three arbitrators, the score (10) degrees and extracted the arithmetic mean of the scores for each skill.

Measurement Test of hip joint flexibility on the device :

- **Name of the test:** measurement test the extent of the angle of the hip joint.

- **Objective of the test:** to measure the angle of the hip joint.

- **Performance method:** The player lying on his back so that the hip at the end of the mastaba and his back base on the device and the legs are stretched on the device arms and when the player stabilizes on the device is lifting one of the legs through the lifting machine, which is close to the upper side of the arm to the maximum and pain in the back thigh muscles⁽⁴⁾. The angle is measured by the angle measure on the device.

- **Recording method:** is done by the angle measure fixed on the device, recording the measurement of the hip joint angle⁽⁵⁾.

- **Number of attempts:** the player has one attempt.

Exploratory Experience

The researchers conducted the Exploratory Experience on Monday 15/3/2019 on the sample of (5) players:

- Knowing the required time for tests when applied to take advantage of this when conducting the main experiment.

- Check the accuracy and safety of the devices and used tools and how to record the results.

- Inform the assistant team on how to conduct the tests.

- Extract the scientific standers of the tests and the method of measurement on the device⁽⁶⁾.

Scientific standers for the tests:

Validity of the test:

The apparent validity of the test was result from showing the designed device on a group of experts and specialists and confirmed the validity of the device to measure the hip joint angle

Test stability:

The test method was used and re-tested, the test was re-applied after seven days and processing results of two tests by using Correlation coefficient (Pearson) reached (0.88) and its represents high correlation value which indicates to the stability of the test

Objectivity of the test:

The correlation coefficient was extracted from the results of the exploratory experimental sample by testing the elasticity of the hip joint at the same time and the correlation coefficient was evaluated (0.89) which indicates too objective the test.

Pre-testing:

The pre-test tests were conducted on 25/3/2019, where the hip joint flexibility measured and PNF

exercises were applied to the research sample and all the conditions which performed of these tests⁽⁷⁾.

Preparation and implementation of PNF exercises:

PNF exercises were prepared by the researchers using the hip joint flexibility device^(8,9) and were implemented on the experimental group which included (16) training units at rate of two units per week. the duration of the educational unit lasts 120 minutes and the application of educational units lasted for (8) weeks from 18/4/2019 until 20/6 / 2019.

post -tests:

The post-measurement of kicking skills applied after perform the PNF exercises by using the hip joint flexibility device prepared by the researchers on 27/6/2019 and on the same conditions as the pre-test.

Statistical Methods: The researchers used the statistical bag (SPSS) in analyzing the data

- Arithmetic mean.
- Mediator.
- Standard deviation.
- Torsion coefficient
- T-test for associated samples.
- T-test for independent samples.
- Pearson.

- show, analyze and discuss the results.

-show the results of kicking skills and hip flexibility:

Table 3: Shows the arithmetic means and the standard deviations of kicking skills and hip joint flexibility in the pre- and post-test of the two groups

Groups	variables	measuring unit	Pre-test		Post-test		Calculated (T) value	Significance level	Type of significance
			S	A	S	A			
	Angle of hip flexibility	CM	122.53	11.67	127.25	12.14	2.75	0.01	moral
	Apollo Jacky (Vocal solo kick)	Degree	6.14	2.43	8.45	2.76	2.28	0,01	moral

Cont... Table 3: Shows the arithmetic means and the standard deviations of kicking skills and hip joint flexibility in the pre- and post-test of the two groups

	Jikojki (Kick Hammer Front)	Degree	6.47	1.09	8.76	2.45	2.67	0,02	moral
	Higujki (Round Kick)	Degree	6.34	1.59	8.64	2.34	3.54	0,00	moral
	Angle of hip flexibility	CM	121.07	11.49	122.12	11.89	1.98	0.14	No- moral
	ApolloJacky (Vocal solo kick)	Degree	12.6	1.23	7.25	2.11	1.87	0.01	moral
	Jikojki (Kick Hammer Front)	Degree	6.21	1.16	7.32	1.89	2.21	0.00	moral
	Higujki (Round Kick)	Degree	6.13	1.36	7.54	1.87	2.43	0.02	moral

Table (4): Shows the arithmetic means and the standard deviations of kicking skills and hip joint flexibility in the pre- and post-test of the two groups

Groups	variables	measuring unit	Pre-test		Post-test		Calculated (T) value	Significance level	Type of significance
			S	A	S	A			
	Angle of hip flexibility	CM	127.25	12.14	122.12	11.98	1.98	0.01	moral
	ApolloJacky (Vocal solo kick)	Degree	8.45	2.76	7.25	2.11	2.67	0,01	moral
	Jikojki (Kick Hammer Front)	Degree	8.76	2.45	7.32	1.89	2.54	0,00	moral
	Higujki (Round Kick)	Degree	8.64	2.34	7.54	1.87	2.28	0,01	moral

Discuss the tests results of kicking skills and the hip joint flexibility

Through what show in the table (4) shows the significant differences in the angle of hip joint flexibility, the researchers know the reason for the device which used for exercise by clearly effect on the performance and hip joint flexibility by increasing the efficiency of muscles and ligaments surrounding the joint and according to performance requirements which requires presence of perfect motor control when performing to score a point on the opponent and requires from the player a good knowledge of the mechanical laws to the extent of movement and development. The lower limbs are at best to maintain the edition of some physical abilities when the player extends his leg during the direction of a certain kick and the participation of all joints of the body must be the maximum speed and then achieve control through the contraction of muscles working on the joints at the end of the movement to reach the goal and this is confirmed by (Nawal Obeidi and Fatima al-Maliki), as the more flexible the appropriate degree the faster the rotation. This is confirmed by the device, which measures the angle of flexibility of the hip joint (1),

and on this basis has been divided skills kicking Taekwondo and hip joint into its parts according to mechanical foundations and the increase of the extent of the hip joint in the corner is through the first two stages is to accelerate the ground strike man and this is from During the dynamics of the movement and the second is the dynamic relationship between the end of the movement and score points ie it is to reach the goal and achieve a point by pushing the man strongly and speed within the required range requires a large mechanical force useful in the control to perform skills properly and this requires high flexibility Count on the expansion of the motor range of the joint, which is reflected positively in the development of muscles involved in the performance, as the device designed to measure the flexibility of the joint under the influence of an external factor, the device and this is called negative lengthening (1) and this is what researchers used for the exercises prepared on the device in order to Increase the angle of the hip joint and focal point easily.

Also, the following table shows the presence of significant differences in the performance of motor

skills and the researchers attribute this reason to the fact that the members of this group has been trained in these exercises (PNF) and through the device that was used and given time and linking them to performance led to the emergence of significant differences as these exercises It works to stretch the muscles and ligaments surrounding the knee and hip led to the development of the skills under discussion in addition to it helped to improve the overall shape of the movement and basic positions. The researchers also believe that these exercises and their compatibility with the requirements of the effectiveness of Taekwondo determine the level of motor performance and this is confirmed (Mehdi 2008) (must be integrated exercises (PNF) with the form of motor skill on the device as well as these exercises positively affected the performance of kicking skills, especially working muscles However, this is related to the development of the flexibility of the hip joint, which helps freedom of movement in various directions without feeling any particular pain (2), and this is what tests were done through the device and considered the starting line for the beginning as well as the angle gauge Connect the hip and then do the exercises that were prepared in the correct scientific form.

Conclusions and Recommendations

Conclusions

- 1- The researchers concluded that PNF exercises on the system used have a significant impact on the development of working muscles of the hip joint.
- 2 - Diversification and change through the device helped to develop the skill performance of kicking skills.
- 3- The use of exercises (PNF) according to the device was close to the performance similar to the performance of the skills in question helped in developed these skills.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: None

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