International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 05, 2020
ISSN: 1475-7192

Training of Decentralized Muscular Constriction with Restrictive Resistances in Improving the Efficiency of Real-time Propulsion and Upgrading and the Achievement of High Jump for Young

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Abstract--- *The high jump activity abounds in many difficult and complex technical stages that require observance of mechanical conditions and mastery of them to serve the kinematic paths, and this requires searching for auxiliary means related to technical performance to have an impact in the integration of these mechanical conditions for the stages of this event to improve the level of performance of the jumpers of this effectiveness, The importance of the research lies in the training of force by the decentralized contraction with restricted resistances when the working muscle is prolonged by the preparatory conditions and showing its effectiveness to increase the force push and its efficiency in terms of the angle of flight and the change of linear momentum and strengthening the link between the last step Rh and upgrading so as to contribute to the development of the level of mastering and streamline the performance of these stages according to the mechanical performance, the researchers hope to clarify the role of these exercises law impulse intraday to improve the achievement of the youth bouncers efficiency. The researchers used the experimental method and applied the research to a sample of high jump champions. They used kinematic analysis and video imaging to measure some of the mechanical variables for the end-of-approach and push-and-end variables), and training for the decentralized contracting of the preparatory positions using rubber ropes and the translator device was applied as resistors of these conditions that could contribute to the development of mechanical conditions related to the stages of approaching and upgrading the high jump and included (32) units, With (4) training units per week. The researchers concluded that the exercises affected the development of the starting variables, the flight angle, and the moment-to-moment efficiency, and a result of them was an evolution in the achievement of the achievement achieved.*

Keywords--- *Central Lengthening, Mechanical Variables, Impulse Efficiency.*

I. INTRODUCTION

The use of physical exercises based on the foundations of sports training science and in accordance with the need for these exercises is to enhance physical capabilities and to establish the motor pathways and development of various parts of the body according to the stages of performance, which is one of the important things necessary to jump with a stick. And he entered kinetic analysis as a science originally concerned with detecting errors in the

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DOI: 10.37200/IJPR/V24I5/PR2020734
Received: 18 Apr 2020 | Revised: 26 Apr 2020 | Accepted: 16 May 2020

motor pathways and to help prepare special exercises to straighten these paths after knowing the muscles responsible for implementing them in various parts of the body, as many innovative exercises can be used that can make an appropriate impact in the good motor pathway, and this is what The base forms the basis for sporting achievement and its long-term development in a manner that guarantees the upgrading of the skill and physical level.[1]

The importance of the research lies in enhancing the role and effectiveness of using decentralized force training (the decentralized contraction that represents the preparatory position) using rubber cords and the multifactor device in a direction in the development of instantaneous impulse and mechanical conditions accompanying the performance of high jump jumping, its mastery and smoothness of performance, and enhancing the momentary impulse efficiency that is linked to achieving the starting angle Effective and at least diminishing momentum during the upgrade, researchers hope to clarify the role of these means and their effectiveness in enhancing the skill and physical side at the moment of the rise and what it is supposed to be to achieve an effective momentary impulse without a noticeable decrease in momentum A linear which must be inversely proportional to the angle of the starting Leaper of the effectiveness of the high jump and a new scale to measure the efficiency of animpulse in terms of the intraday angle starting and decreasing linear momentum.[2]

In particular, high jump needs a careful study of the kinematic paths of the different body parts during the application of the stages of the performance of this event, given the complex technical performance of this activity, and the special physical capabilities it needs, and this requires giving great importance to the auxiliary means that its use is related to according to the mechanical foundations and the motor goal Including reducing time and reaching international levels that the Iraqi players did not rise to, as the international achievement of this category reached (2.33 meters) while the number in this event for this category is at the level of Iraq (1.96 meters) and worldwide (2.45 meters), and this is in fact E formed one of the problems that this activity suffers from, especially in the search for ways that limit time and secure the hopper's access to a good technical and physical level. This is what led researchers to choose decentralized strength training as it represents the preparatory position that is supposed to be in the highest technical form correct to give the effective impact of the duty The main performance, which may help to develop technical aspects and mechanical conditions and enhance them according to the kinematic paths of the different body parts after these movements are analyzed through kinetic analysis and to reveal the deficiencies and weaknesses in this performance so that we can choose the type of means that can It helps in developing special physical abilities and mastering correct and appropriate motor performance in them. The importance of the research lies in the use of the law of instantaneous impulse efficiency as a new law that indicates the effectiveness of effective upgrading with all its indicators (angle of departure, change of linear momentum) for success in providing the body with the distinctive technical performance to achieve good achievement by jumping in the adulterer for young adults.[3] The aim of the research is to identify the level of some of the biomechanical variables for the stage of stick jumping for the research sample, to prepare a law to measure the momentum momentary efficacy in terms of the angle of flight and the change of linear momentum, and to prepare decentralized force exercises to develop some biomechanical variables and the momentum momentary efficiency of the stick jumping by using auxiliary devices and devices. The researchers hypothesized that there is a positive development for indicators of biomechanical upgrading and instantaneous efficacy of the research sample.

DOI: 10.37200/IJPR/V24I5/PR2020734
Received: 18 Apr 2020 | Revised: 26 Apr 2020 | Accepted: 16 May 2020

II. RESEARCH METHODOLOGY

The researchers used the experimental approach, and the research sample was identified from the high jump players of the Sports Talent Center Athletics ages 16-17 years and they represent the original research community, with the intended sampling method and they numbered (3 jumpers) who have an international level of achievement and the researchers achieved the moderate side of the sample within the normal distribution For the sake of the safety of the statistical operations, and choosing the most appropriate one according to the results of this distribution, according to the variables of age, training age, length and mass, Table (1) is noted.

Table 1: Shows Features of the Research Sample

S	Variables	Units	Mean	SD	Median	Skewness
1	Age	Year	16.5	0.45	16	1.11
2	Training age	Year	4.45	0.03	4.40	1.66
3	Weight	Kg	62.4	1.5	62	0.285
4	Length	Meter	1.73	0.05	1.72	0.200

The values of the torsional coefficient were all less than (± 2), which indicates the normal distribution of the sample. The researchers used foreign and Arab sources, the international information network, observation and experimentation as means of collecting information, and they used the most important tools and devices in the subject of the research in order to carry out field research procedures, which is a video camera (Type 2) with a speed of (120) images per second and a computer (laptop) type (***hp***), an electronic medical device for measuring weight and height, rubber cords and a multi-function device.

The research was applied by conducting a high jump test within the rules of the International Federation in strong games, and 3 attempts are given for each height according to international law, starting from a height of (1.80 m), and the cross rises after each successful attempt (5 cm) to a height of 1.90 m, then the crossbar is raised after each A successful attempt every 3 centimeters, after it was agreed upon according to the sample level, and the test was videotaped through two cameras for the purpose of analyzing the film and extracting biomechanical variables. Video filming was carried out by two high-speed video cameras type (SONY 120 Pic./Sec.) 2D. Capture video recordings after installing the first camera Its bearings are 5.8 meters high and 1.50 meters high on the right side, so that its lens is perpendicular to the player's elevation point from the right side. The second camera is installed on the left side and away from the running field of (4.8) meters and a height of (1.6) meters, and the same distances were applied in both pre and posttests. All attempts were photographed and the following variables were extracted after the best analysis of the height reached by each player in both the pre and posttests according to the kinvoea kinematic program. The following biomechanical variables were measured by photographing the sample during the pre and posttests and analyzing it with the kinvoea program.[4]

- Starting angle (degrees): measured by the angle between the line connecting the hip point before leaving the ground and after leaving the earth in eight pictures with the line passing through the hip horizontally and parallel to the ground.
- The approaching speed (meters / second) was measured by determining the length and time of the last approach step directly from the computer, since the speed of this step represents the final speed before the upgrade.

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- Starting speed (m / s): measured by the distance traveled by the hip point from the moment the Earth was left to eight images of leaving the Earth and dividing this distance by its time.
- Instantaneous impulse efficiency in terms of linear momentum and flight angle change (degrees / joules / kg).

This Indicator was Calculated as Follows

Calculating the initial linear momentum after calculating the velocity of the last step to the moment of reference and reaching the vertical position and multiplying it by the mass of the body, (body mass x its speed at the last running step), and then calculating the final linear momentum after calculating the starting velocity from the moment of the vertical position to the moment after leaving the Earth Multiply it by the mass of the object (body mass x its starting velocity), and the indicator is measured as follows:

Momentum Efficiency Index = Launch angle ÷ (Final Momentum) - (Initial Momentum)

The result is divided by the mass of the body in order for the indicator to be (d / kg2m / s), that is, the decrease in momentum is for every 1kg of the body. [5]

The researchers conducted an exploratory experiment on (10/2/2019) on the individuals of the sample in order to achieve the following goals:

1. Adjusting the performance of the devices used and fixing the location of fully positioning and setting up the imaging cameras.
2. Knowing the obstacles and mistakes that accompany the research procedures.
3. Knowing the suitability of the outdoor stadium and conducting exercises.

The researchers conducted the tribal tests on 16-17 February 2019, on the basis of which special exercises were developed and implemented as follows:

1. Achievement test for the individuals in the research sample.
2. Analyzing mechanical variables through analysis programs.

The researchers applied the training for the period from 2/17/2019 to 4/19/2019, which included 32 units, with 4 training units per week. It was agreed with the Center's instructor, trainer, regarding the application of rubber cord training, the decentralized contraction and the multigener apparatus at the preparatory positions. The exercises were related to the technical performance, which can contribute to developing the muscle strength on which the momentary impulse is incumbent on the members of the sample according to the mechanical conditions related to the stage of linking the last step and upgrading the high jump. The researchers approved the development of these exercises through their long experience in the field of training and biomechanics, and the training load was determined as follows:[6]

The intensity of the training with regard to the rubber cords, the maximum length of the rubber cord was adopted when elongated, representing the intensity of 100%, the training intensity is determined accordingly:[7]

Example: If the maximum elongation of the rope is 5 meters, it represents 100%, it represents the maximum resistance intensity.

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Received: 18 Apr 2020 | Revised: 26 Apr 2020 | Accepted: 16 May 2020

- The decentralized contraction time was from (8-12 seconds) with repetition of 8-10 times and rest according to the work time, and by shedding intensity from 90 -100% of the maximum length of the rope, the repetition of the exercises was from 8-12
- Rest time has been determined from the ratio between effort time to rest time.
- The maximum resistance was adopted for the multigenerative system in determining the training intensity of the decentralized muscle contraction.
- The gradual increase in the training load gradually after every two weeks, as the exercises were repeated every two weeks, and the training load gradually increased with the other two weeks, and so on.

Example of a training unit: From standing position and standing grip, tying the leg of the leg up with a rubber cord attached, the player pulls the rope with the leg which is bent and with the maximum length of the front thigh muscles and in the fixed position it repeats (10 times) x 4 at rest 1: 10 for each leg, and the exercise is repeated for the thigh muscles The background is the same way.

Post tests conducted on 18-19 / 4/2019.

III. RESULTS AND DISCUSSIONS

Table 2: Shows the differences between the mean, the standard error between the differences, the values of (t), and the pre- and post-tests of the biomechanical variables of the research sample

Variables	Units	Pretest		Posttest		Mean diff.	SD diff.	(t) calculated	Sig. level	Type of Sig.
		Mean	SD	Mean	SD					
Starting angle	Degree	43.2	2.38	52.4	1.94	9.2	1.20	7.60	0.00	Sig.
Approach speed	M / s	7.56	0.43	7.94	0.30	0.38	0.07	5.42	0.001	Sig.
Starting speed	M / s	6.10	0.37	6.34	0.21	0.24	0.10	4.26	0.005	Sig.
Efficient impulse	D / kg 2.m / s	21.2	1.4	34.3	2.1	13.1	2.10	6.23	0.004	Sig.

Significance in front of the error level ≤0.05 and the degree of freedom (2).

Table 3: Shows differences between the mean, standard error between differences, (t) values, and pre- and post-tests of velocity averages for the stages of the research group

Variables	Pretest		Posttest		Mean diff.	SD diff.	(t) calculated	Sig. level	Type of Sig.
	Mean	SD	Mean	SD					
Achievement (m)	1.90	0.09	2.05	0.04	0.15	0.026	5.60	0.000	Sig.

Freedom degree (2) and below the error level ≤ 0.05.

The results presented in Table (2) above indicated that the exercises aimed at deepening the foundations of applying the correct movements in accordance with their technical course through the use of some aids to support the preparatory situation, which is the basis for the application of the main section of the movement promoted the achievement of the speed and angle required to start through an update The work in these muscles and their preparation for improving and developing variables of approach speed, starting speed and angle as well as the evolution of the kinetic efficiency index (kinetic transport efficiency) in terms of the angle of flight and the change of linear momentum, according to the results of the analysis.[8]

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The exercises of decentralized muscle contraction have reinforced the values of these variables in a positive way and made the performance appear to be as consistent as possible with the objective of the performance, as training according to the results of the analysis and using the proposed training methods that the sample members were exposed to was influencing the development of the speed of approach and the improvement of the good link between the steps The recent approach to approach with upgrading, which made the relative increase in the starting angle influencing in ensuring that there is no decrease in the starting speed and giving sufficient scope for the movement of the two men (driving and driving) and their weight, [9]so as to ensure achieving a good position to rise and cross the crossbar, and to preserve the quantity The movement acquired and required for the body to continue at its optimum speed after departure, as training using the rubber ropes and the translator device when conducting special exercises for these stages strengthened the player's physical ability and sense of the strength values required to achieve the kinematic paths, which were also represented in achieving the effective extension of the vertical direction at the moment of pushing the man as well as information Corrections (feedback) to which he is subjected at each repetition, and the decentralized contractions exercises improve the strength and muscle function of the muscles working in the legs, arms, and torso, and increase the muscle strength during the stages of performance This and the increase in the efficiency of their neuromuscular compatibility and with appropriate times between repetitions and these exercises all led to an improvement of the motor pathways, especially at the moment of linking between the last steps and the effective extension which is one of the most important stages affecting the interconnection of the technical performance of the high jump player, which inevitably affects the achievement of good achievement.[10]

And there had to be repetitions of speed training for approaching and upgrading performance on different platforms to uplift and resist rubber ropes that help increase the sense of upgrading foot and increase the sense of effective thrust at this moment in order to develop mechanical variables What is related to these stages, which are related to the speed of approaching, the speed of departure, its angle and the extension of the near object at the moment of impulse, since the goal of the exercises used is to develop the special speed, learn the sense of the right rhythm, and continue with it, therefore, a sufficient period of adequate rest should be allocated in order for the player to keep the desired rhythm In running during these exercises and correct linking with the process of upgrading. [11]The special training works to achieve a new digital achievement and maintain the level in the races with frequent movement.[12]

“As the higher the height of the jump, the greater the accuracy of the body’s movements and its control, according to the required mechanical conditions, because the height gains control of the body’s movements in the air and increases the field for the safe disposal of the crossbar when it passes”.[13]Hence, it must be emphasized on the height of the hip point and the development of jumping during training through various strength training programs, because the starting angle and speed have a direct impact on the player's speed during height and impulse and during attachment and this is reflected in the height of the players in the air.

From Table (3) it appears that the achievement has improved significantly, that the goal of the exercises was to develop the speed of departure that serves to achieve the achievement that is directly related to its increase, so this topic is due to the nature of the movements that the members of the research sample are trained on in how to use the

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correct link between The end and beginning of each stage which strengthened the correct link between the speed of approach and advancement during the performance of competitive attempts to achieve good achievement in posttests, and this indicates the improvement of the members of the sample for the stage after the advancement and control of body parts at the moment of passing the crossbar, and this makes the results develop in this The variable of the result of applying the proposed training according to the performance stages in a way that serves the accomplished achievement, as well as the trend towards increasing the special speed in the competition conditions. This was achieved by using rubber ropes to develop strength with decentralized stretching and according to the muscle work associated with the properties of the muscles that operate when running and jumping to ensure the motorization of a good rhythm, commensurate with the requirements to achieve achievement in this competition, and according to its mechanical conditions associated with the educational and training aspect.[14]

The increase in strength in both legs and arms means that an increase will be achieved in the overall body speed (linear and angular), and this increase was characterized by strong reactions with performance and with the reactions of the body in the stage of rise and effective extension in order to serve the stage of passing the crossbar that achieves the goal of application Correct for all phases (achievement), as the exercises achieved an increase in the efficiency of the momentary impulse in terms of the change in momentum and the angle of flight, which affected the result of the efficiency of the momentary impulse and led to the speed of the body and its impact on the achievement achieved, if we know that the best result of the achievement comes from the effective contribution of body parts all The flow and performance of their performance and their interconnectedness with each other, "the volcano contributes to improving the motor transport with high accuracy and smooth flow of the movements performed in the air, and then increasing the productive force to achieve an acquired speed of the body".[15] It gave the right field to increase the speed of the trunk at to The moment before the crossbar crosses, because as we mentioned earlier, there are adverse reactions to the body, so the arm and the stem take the appropriate mechanical position to serve the kinetic performance of this activity.

One of the practical results achieved in the overall performance of the members of the research sample that were associated with the progress achieved in the muscle forces in the working groups, and this came in line with the increase in the momentary force that affected the achievement of the angular velocity of these parts that were compatible with the development of linear momentum, with a result The achievement achieved and gave a direct indication of the impact of the training by using the means to improve the efficiency in achieving the skill and cognitive goals.[16] Moreover, these means give a positive opportunity to understand the components of the skill performance and the possibility of its application in practice and then give an effective impact in raising the level of performance Kinesthetic Skills.[17]

IV. CONCLUSIONS

1. The training with various training means (rubber and rubber cords) for the members of the research sample worked on developing the starting angle, its speed and the momentum efficiency in a clear way.

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2. The exercises with the auxiliary means were effective in achieving the status of the moment of effective momentary extension, which was to maintain the amount of movement acquired and required for the continuation of the body at its ideal speed after the launch and effective extension later.
3. The linear momentum at the moment of approaching has been mocked with a slight decrease in the moment of departure with the development of the angle of departure that is inversely proportional to it, and this indicates the development of this indicator that enhances the development of the momentary momentum associated with the development of the muscle force responsible for maintaining the mechanical energy values at the moment of elevation.
4. The improvement in velocity results is directly proportional to the achieved vertical height. It led to an improvement in the achievement and the mechanical conditions associated with it.

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DOI: 10.37200/IJPR/V24I5/PR2020734
Received: 18 Apr 2020 | Revised: 26 Apr 2020 | Accepted: 16 May 2020