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THE EFFECT OF (SUPER SET) TRAINING ON THE DEVELOPMENT OF SOME PHYSICAL ABILITIES AND LINEAR MOMENTUM OF THE APPROACH STEP FOR YOUNG HIGH JUMPERS

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ABSTRACT

The training methods are the positive training techniques between the coach and the player to walk on the path that leads to reaching the goal in training by organizing the training load accompanying the mechanical foundations, which help to understand the angles and lines of training work and to identify weaknesses and find solutions to them. Superset training is considered one of the exercises Modern technology to develop many physical abilities, so the researcher decided to work with these exercises to achieve the goals in reaching the player to the best achievement, and by looking at the previous studies, she did not find a study dealing with superset exercises using linear momentum for the effectiveness of the high jump, and the study aimed to prepare superset exercises in some physical abilities And the linear momentum of the approach step for high jumpers and knowing the effect of superset training on the physical abilities and linear momentum of high jumpers. The researcher assumed the presence of statistically significant differences between the pre and post tests. The training program was applied to a sample of young players with high jump effectiveness, which numbered (5) players, who were subjected to pre-tests. For mechanical physical abilities, the researcher concluded the training program The superset had a positive effect on the physical and mechanical variables in the jumping efficiency.

Keywords: (super set) exercises, physical abilities, linear momentum, approach step for high jumpers

1 - Introduction and the importance of the research

The science of sports training depends on several methods, as each sporting activity differs in its training method from the other according to the type of activity itself or to the appropriate energy system that the coach works to develop to raise the level of the athlete to the goal to be achieved through “choosing the

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appropriate method for the training process according to the level and conditions of the player." (1:87)

It can be said that the training methods are the positive training methods of interaction between the coach and the player to follow the path that leads to reaching the goal of training through the organization of the training partridges accompanying the biomechanical ace, which helps in understanding the angles and lines of training work and identifying weaknesses and finding solutions to them.

The (super set) exercises are considered one of the modern directives for developing many physical abilities that fall within the physical requirements of sporting events, and each activity is according to its physical and performance specificity. And these exercises remain with in the general frame work and rules of sport training , but they set aside anew style by presenting more challenges due to the difficulty of the exercises and the athlete is required to over come them. The concept of superset training is very simple, which is to perform any two physical exercises without a rest period or with very little rest. That is, it is a regular exercise, but it combines two exercises without a rest period between them, according to the training goal and the specialized effectiveness. The high jump is one of the difficult activities of the arena and field games that depend on the player's ability to transfer horizontal speed to vertical speed, i.e. transfer the center of gravity of the body mass towards the jump beam, and this depends on Initial speed and accuracy of getting up towards the crossbar and the importance of the weight of the player's center of gravity in the last step to pass the crossbar and in a vertical direction requires a lot of training to develop physical abilities and accuracy of getting up towards the crossbar, so the researcher wanted to work with training within the (superset) style to allocate these goals in the player's arrival to the best achievement through variables Biomechanics and their employment to obtain better results on testing these exercises with a modern and scientific method.

1-2 Research Problem

The effectiveness of the high jump depends on several factors related to the rate of starting speed with the power of the push, and on many physical abilities related to the power of the jumper's thrust during the ascent and the variables of the step length, bending and extending the knee during the vertical jump through

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the power exerted on it, and there have been many training techniques and methods of training Both from his scientific point of view.

Through the researcher's review of many research and studies that dealt with the activities of athletics, she found a lot that dealt with mechanical variables, but she did not find a study that dealt with the achievement of high jumping from a mechanical point of view, according to superset exercises using linear momentum. The researcher believes that there are mechanical laws related to the variables of force and momentum. It is possible Determine the intensity of training on the basis of which to create a state of adaptation to the locomotor system. In her research, the researcher dealt with the law of linear momentum, which is related to body mass and the power of the high jump through the application of superset exercises on the sample, considering this method as one of the training methods that simulate and harmonize the mechanical variables in obtaining the correct jump through the last step and the ascent, which is a simple scientific addition.

1-3 Research Objectives

1- Preparing (super set) exercises in some physical abilities and linear momentum for the step up for young high jumpers

2- Knowing the effect of (super set) training on some physical abilities and the linear momentum of the step up for young high jumpers.

1-4 Imposing research

- There are statistically significant differences between the pre and post tests of the research sample in some physical abilities and the linear momentum of the ascent step for young high jumpers.

1- 5 Areas of Research

1- 5- 1 The human field: a sample of high jumpers in the youth category, who numbered 5 players

2-5-2 Temporal field: for the period from 2/25/2022 to 4/15/2022

2-5-3 The spatial field: the arena and field stadium in Al-Jadriya College of Physical Education and Sports Sciences / University of Baghdad

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2 - Research methodology and field procedures

2-1 Research Methodology: The researcher used the experimental approach due to its suitability to the research problem, "that the research tries to introduce an attribute or a variable through which the state of the sample or the thing to be changed can be changed" (2: 82).

2-2 Research Sample:

The research sample was selected in the vertical way from young high jump players, who numbered (5) players who are training within the training season (202-2022), and it was agreed with the coach to apply (super set) exercises to the members of the research sample within the main section of the training unit in the stage Special preparation, where 20 minutes are taken from the time of the training unit to apply the exercises.

Homogenization was carried out for the research sample in the variables (height, weight, age, training age).

Table (1) It shows the normal distribution of the research sample in variables (height, weight, chronological age, training age)

variants	measruing unit	Arithmetic mean	standard deviation	Mediam	torsion modulus
height	C.M	169.91	27.22	170	0.821
weight	kg	65.43	7.82	65	0.603
the age	year	17.49	2.93	17	0.499
training age	year	3.87	1.05	4	0.337

2-3 Tools, means and devices used in the research

1- Stopwatch (2)
2- Laptop (1)
3- Observation and experimentation
4- Boxes of different heights.
5- Barriers of different heights.
6- terrace.
7- Exploratory experiments.
8- Tests and measurement.
9- A video camera.

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10- Stationery.
11- High jumping device.
12- Colored cones.
13- Weights of different weights.
14- Kcnova analysis program for phosphorous points
15- Force sensor device

2-4 Field research procedures

The researcher presented a group of biomechanical tests used in the research to a group of experts with expertise and specialization(*) and the most important tests appropriate for the research were selected. They are as follows

2-4-1 Biomechanical tests used in the research

1- Initial linear momentum kg/m/sec
2- Linear momentum of advancement kg/m/sec
3- Linear momentum of the approaching step, kg / m / s

2-4-2 Physical abilities tests used in research (1:56)

1- Explosive power : Sargent test
2- A test of 30 meters of steadiness to measure the transitional speed
3- Jumping test (15 seconds) with a weight of (30 kg)
The purpose of the test: to measure the strength characteristic of the speed of the two legs

2-5 Exploratory experience

The researcher conducted the exploratory experiment on 25/2/2022 at ten o'clock in the morning at Al-Jadriya Stadium on a sample of (2) who were not excluded from the sample of the main experiment, and its purpose was
- Knowing the position of the video camera for shooting
- Set capture to jump
- Knowledge of the support team.
- Adjust training units in terms of rest, intensity and repetition
- How to place phosphorous points for analysis

*) The experts are: 1- Prof. Dr. Sareeh Abdel-Karim and Dr. Zina Abdel-Salam , Prof. Aseel Jalil , Prof. Dr. Suad Abdel Hussein

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2-6 pre-tests

The researcher conducted the pre- tests on March 1, 2022 at ten o'clock in the morning in the arena and field stadium in the College of Physical Education / Al-Jadriya.

2-7 The main experiment

- The training curriculum was applied to the experimental research sample on March 2, 2022
- The experimental exercises (super set) were given in the main section of the training unit, where 20-35 minutes were invested from the time of the training unit.
- The training program was applied at 3 training units per week, thus the number of units became 24 training units, for a period of eight weeks.
- Superset exercises were applied and implemented for each exercise with specific repetitions without rest times between the two exercises
- The exercise intensity was 80-90%.
- The researcher used high intensity interval training.
- In preparing the training program, the researcher took into account the gradual repetitions and rest times.
- The superset exercises were applied, which is to perform two exercises in sequence without a rest period between them, according to the determinants and controls of the specific training goal according to the approved training principles, rules, and theories. The researcher used the superset for one muscle group and for the opposing muscles.

2-8 post exams

The researcher conducted the post tests on 4/28/2022 at ten o'clock in the morning in the arena and field stadium in the College of Physical Education, under the same conditions in which the pre-tests were conducted.

2-9 Statistical means

The researcher used the spss statistical bag to process it.

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3 Presentation and discussion of results

Table (2) Between the arithmetic mean and its deviations and the standard error of the mean and the value of (T) and (sig) for the pre-test and post-test) mechanical variables

s	variants	The unit of measure	m.d	d.d	T	the error rate
1	The explosive power of the two legs	c.m	4.32	2.88	-5.76	-0.004
2	**Transition speed**	**second**	**4.08**	**1.98**	**-2.73**	**-0.001**
3	Distinguished strength with speed for the two legs	repetition	4.08	1.92	-4.51	-0.006

(Degree of freedom 4 significant when (sig) > 0.05)

Table (2) Between the arithmetic mean and its deviations, the standard error of the mean, and the value of (T) and (sig) for the (pre-post) test of the physical abilities tests

s	variants	The unit of measure	m.d	d.d	T	the error rate
1	**Initial linear momentum**	**Km/m. second**	**-126.4**	**23.53**	**-3.492**	**-0.008**
2	**Linear momentum of the approach step**	**Km/m . second**	**-174.21**	**69..83**	**-4.747**	**-0.003**
3	**Linear momentum of advancement**	**Km/m . second**	**-96.37**	**43.271**	**-6.19**	**-0.001**

The researcher attributes the development of the research sample in the mechanical tests to the nature of the super set exercises based on the scientific foundations that help in the development of these variables through the correct installation of the support leg during the starting phase of lifting, as it is clear that

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the emphasis on the super set exercises that increase blood flow in muscles. (Abu El-Ela, 1998) confirmed that "super set training is one of the most common methods of training to increase intensity with diversity at the same time, while also saving effort, as the implementation of this method depends on the use of several groups for two different exercises, but they focus on the same muscle group" (32: 3)

"The continuous progress in the development and modernization of techniques related to training and work to rebuild them in line with the modern technological development helped to improve the quality and effectiveness of the training process" (191:4).

The researcher attributes the differences that appeared in the physical capabilities of the high jumpers to the superset exercises used in the training curriculum, which helped improve the mechanical variables, which in turn improved through the physical variables, as the increase in the rate of speed contributed in an appropriate manner leading to the jumper obtaining the appropriate horizontal speed through the correct use For horizontal force and work successfully under biomechanical conditions that serve the movement, which allows to increase the vertical speed and then obtain a vertical distance as confirmed by (Qasim et al.) "Through the last three steps, the previously acquired speed is maintained and slightly increased" (207:5)

The researcher believes that each jumper has his own style in the approximate run and the number of steps to acquire the appropriate speed that is commensurate with his physical capabilities and technical capabilities. athlete, which can be acquired through experience and continuous training" (6:72).

4 - Conclusions and Recommendations

4-1 Conclusions

According to the statistical parameters and results obtained, the researcher concluded the following:

1- The effect of the training program on improving the mechanical variables of the high jumpers

2- The superset training program had a positive effect on the physical variables of the high jumpers

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2-3 Recommendations

1- Work on coordination between trainers and those working on movement analysis to identify the most important mistakes and develop appropriate exercises for them.

2- Training according to modern foundations and rules using modern training based on modern equipment, which has a positive impact on improving performance.

3- Work on mastering the superset training units for all parts of the body to serve the skill.

Sample training unit

Week: First Unit Time (20-35 minutes)

The first unit is the goal of the unit. Develop the explosive power of the two men

Today and date: Wednesday 2/3/2022 intensity 80%

S	the exercise	Repetition	Rest between repetitions	totals	Rest between totals
1	**Deep jump as high as the box 30 cm Then a deep horizontal jump**	**6**	**90 s**	**2**	**180 s**
2	**Jumping hurdles with a height of 30 cm40 cm + deep jump box height 40 cm**	**6**	**90 s**	**2**	**180 s**
3	**Bounce jump on a box with a height of 40 cm + a deep jump with a box height of 40 cm**	**4**	**90 s**	**2**	**180 s**
4	**Jumping steeplechase with a height of 30 cm + 40 cm deep jump with a box height of 40 cm**	**4**	**90 s**	**2**	**180 s**

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