

## The effect of a suggested training device on developing strength for youth handball players

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### Introduction and Research Problem: -

Sports training in its general sense is the educational and educational process that includes preparing the player or team in an organized manner, based on the best modern scientific means to achieve the desired goal. And sports training is not necessarily related to sport of higher levels only, but includes various sports activities, and for sports training in the content of its goals, all members of society, regardless of their different capabilities and abilities, are the broad rule in defining the goals and the scientific basis for their training curricula in proportion to the general sports and cultural trends of different age levels to ensure the practice of sport As a first step to achieve the foundations of reaching the higher levels.

And the scientific and technical development that the world is witnessing at the present time has effectively helped in the development of various sports equipment and tools, which had a great impact in achieving the best sports achievements. And the use of equipment, means and training tools added to the training process a lot of benefit and speed in achieving training goals and proved its effectiveness as one of the important helping factors in reaching high levels in the elements of physical fitness that the player needs and thus speed in achieving victory, as these devices, methods and tools have special goals Some of them are involved in the process of correcting the movement paths, some of them are included in the physical aspects, some of which combine the two by facilitating performance and isolating extraneous movements and contractions that would negatively affect and thus delay the achievement of the ideal level of the player

The handball game is a unit of mathematics that players need to have strength as it is the main pillar of the game because it depends mainly in achieving victory in the game, and the link between muscle strength and motor velocity is one of the requirements for sports motor performance in the handball game, and the strength characteristic needs continuous development in order to Players gain muscle strength as coaches use various methods, methods and training tools to improve the level of the game. Does the manufactured training device work on developing the strength of youth handball players, so the importance of our research lies in finding a training method that helps develop the strength of young handball players through the use of a suggested training device.

### Research Methodology:

Choosing the correct scientific method must be in harmony with the problem to be studied, and since the nature of the problem that the researcher used in her study necessitated the use of the experimental method, which is "the most adequate means in reaching reliable knowledge."

### Research Community and Sample:

The research sample was chosen by the deliberate method, and it consisted of players from Diyala Sports Club for handball for the youth category and their number reached (16) players. 60%) from the

original community of the research sample, as (4) players were used for the first reconnaissance experiment related to the device and the players for the second exploratory experiment related to physical tests

Homogeneity and equivalence in research variables:

In order to determine the level of the individuals of the research sample and to ensure that the results of the research are not affected by the individual differences of the individuals of the research sample, which would change the real reality of the effect of the exploited variable on the dependent variables, the researcher conducted homogeneity among the members of the experimental sample to ensure that a single initiation line begins when the vocabulary of the curriculum begins. Exercises using the training device. Table (1) shows the statistical parameters of the homogeneity of the members of the experimental sample in the research variables, as the error rate for all variables was greater than (0.05). As for extracting the parity between the control and experimental groups, the researcher adopted the pre-tests of the two groups in extracting equivalence. Whereas, the law (T) was used for independent groups between the pre-test scores of the two groups, and Table (1) shows the calculated (t) values and the error rate, and all the results indicated that there were no significant differences between the two tests, and this indicates the equality of the two groups in the research variables.

| Table (1) shows the values of homogeneity and equivalence of the sample |                    |                |              |             |         |              |
|---|--------------------|----------------|--------------|-------------|---------|--------------|
| Variables   | Groups             | measuring unit | A            | STD         | T value | Significance |
| Arm explosive force test  | Control group      | CM             | 4,02         | <b>0,26</b> | 0,26    | Non sign     |
|   | Experimental group |                | 4,09         | <b>0,33</b> |         |              |
| Legs explosive strength test  | Control group      | CM             | 2            | <b>0,11</b> | 0,26    | Non sign     |
|   | Experimental group |                | 1.97         | <b>0,16</b> |         |              |
| Arm strength test   | Control group      | REP            | <b>19,31</b> | <b>7,86</b> | 0,45    | Non sign     |
|   | Experimental group |                | <b>19,62</b> | <b>6,59</b> |         |              |
| Leg strength test   | Control group      | REP            | <b>12,68</b> | <b>2,86</b> | 0,45    | Non sign     |
|   | Experimental group |                | <b>12,25</b> | <b>2,79</b> |         |              |

Devices, tools and means used in the research

search tools

Handball court, distance measure fabric tape, colored flags. ,Adhesive tape.

Devices used:

- 1- The proposed training device. 2- A laptop (DELL) device.
- 3- One (Sony) video camera. 4- One photographic camera.
- 5 - Canon laser printer. 6- A device for measuring height and weight.
- 7 - 2 hours timing - 1 scientific calculator.

Methods for gathering information:

Arab and foreign studies, research and sources, testing and measurement. International Information Network (Internet) Observation and experimentation. Exploratory experiments.

Arm explosive force test.

❖ Medical ball push test (3) kg with two hands.

The purpose of the test: to measure the explosive force of the arms and shoulders.

Equipment needed: flat space area, orthopedic balls (3 kg), chair, tape measure, rope

Test description: The laboratory sits on a chair holding the medical ball so that the ball is in front of the chest and below the level of the chin, and the torso must be adjacent to the edge of the chair, and a rope is placed around the chest of the laboratory so that it is held from the back by a tight way in order to prevent the movement of the laboratory forward while pushing the ball with the hands The movement of pushing the ball is done using the hands only. Test instructions: The tester gives three consecutive attempts, the best of which are calculated for the farthest throw distance, recorded to the nearest (cm).

II- Test the explosive strength of the legs.

❖ Wide jump stability test.

The purpose of the test: to measure the explosive force of the two men.

Tools needed: a bouncing place divided in meters and centimeters to the end of the field, a tape measure, cutting tips.

Performance description: The laboratory stands behind the starting line and the feet are slightly apart and parallel. Then the tester begins swinging the arms backward with the knees bent, then jumping forward as far as possible by extending the knees and pushing the feet with the arms swinging forward.

Score calculation: The measurement is from the starting line to the last part of the body that touches the ground, and each attempt is measured to the nearest (5 cm) and the tester's best attempt is calculated.

III - Test the strength of the arms.

❖ Test push up until the voltage is depleted (forward support).

The purpose of the test: To measure the strength endurance of the muscles of the arms and shoulders.

Performance specifications: From the position of sloping (front support) the tester bends and extends the arms to the maximum number possible.

Conditions: It is not allowed to stop during the performance, and the straightness of the body is noted during the performance stages, the necessity of touching the chest to the ground when bending the elbows, and the arms fully extended when ascending.

Recording: It records for the tester the number of correct attempts made

Fourth - Strength test for the legs.

❖ Test jumping from squatting in the same place for a period of (45) seconds.

The purpose of the test: to measure the endurance of the leg muscles.

Tools used: bar height (30) cm, stopwatch, whistle.

Performance description: The laboratory takes a squatting position next to the bench so that the hands are intertwined over the head, and upon hearing the whistle, the tester extends the knees to the vertical jump, provided that the level of the feet at the end of the jump is not less than the level of the bench, and the laboratory continues to perform for a period of (45) seconds until the whistle is heard To finish.

Recording: It records for the tester the number of correct attempts made

Exploratory experience:

The researcher conducted the first exploratory experiment on an exploratory sample consisting of (4) players from the same research community on Saturday 6/10/2019, and the purpose of which was to identify the method and mechanics of the device's work and how to determine the resistances used in training and how to determine the training intensity to be implemented on the research sample The right amount of time for exercise and rest time. With the help of the helpful staff

Knowing how appropriate the tests are for the level of the research sample.

1. Ensuring the validity of the test location and its suitability for carrying out the tests.
2. Identify the extent of the sample members' understanding of the tests used.
3. Ensure the number and competence of the assisting work team.
4. Knowing the time taken to execute the tests and the time it takes to execute each test.

Field research procedures:

#### Pre-tests:

Pre-tests were conducted for the members of the research sample (the control and experimental groups). The tests were conducted for each individual sample, and all were photographed, and the best achievements were recorded, and they were as follows:

- 1- The explosive force of the arms test.
- 2- Test the explosive strength of the two men
- 3- Arm strength test.
- 4- The strength test of the two men.

The tests were carried out after the researcher briefly explained how to perform the tests and their sequence, and the researcher worked to establish all the conditions related to the tests, such as location, time, method of implementation, and the members of the assisting work team both and their location in order to work as much as possible to create the same conditions during the tests. Dimensional.

#### How does the training machine work:

The working mechanism of the training apparatus is represented by obstructing the player from launching forward freely and trying to impose resistance from the back on the player, represented by a maximum resistance (weight) (8.75 kg-9 kg) that is controlled by a screw axis to determine the amount of resistance imposed on the player. The player's chest of the device, which is linked to the resistance ball, and begins to carry out the exercise according to the distance and the chosen resistance according to the physical ability to be targeted in the training unit. Exercise execution) begins with performing subsequent iterations in the same manner.

To determine the training intensity for each exercise, a measurement was made to calculate the maximum intensity for each member of the experimental sample by setting the device to the maximum resistance and a distance of (50 meters) and according to this intensity, the intensity was extracted for each exercise.

Example: a player of maximum strength on the training machine (9 kg), what is the amount of resistance if he trains hard (50%)?

$$100\% = 9\text{kg} \times 100$$

$$50\% = x / 9\text{kg} \times 100$$

$$\text{So } Q = 9 \text{ kg} \times 0.50 = 4.5 \text{ kg}$$

The intensity can be increased or decreased by controlling the running distance and according to the formation of the load for each of the targeted physical abilities.

#### Exercise methodology used in the research (device training):

- The training curriculum was prepared using the training device and was applied during the special preparation period, as the implementation of the exercises began on Tuesday 10/10/2019 and continued until Monday, 12/16/2019.
- The application of the exercises curriculum using the training device took a period of (8) weeks with (3) training units per week, and the total number of units was (24) training units during the period of the experiment.
- The time of the total training unit took (90) minutes, while the time for the special resistance exercises provided is (40-45) minutes in each training unit and from the main part.

Dimensional tests of the research sample

The researcher conducted the post-tests on Thursday 19/12/2019 at the Diyala Sports Club at nine in the morning, and the researcher was keen to provide the same conditions and requirements in terms of place, time and other application procedures.

The statistical methods used in the research:

The researchers used the SPSS bag. The results of the research were extracted

Presentation and discussion of results:

Display and discuss the results of the control group:

| Table (2) the values of the arithmetic mean and standard deviations of the search variables for the control group |           |                |       |      |                          |                  |              |
|---|-----------|----------------|-------|------|--------------------------|------------------|--------------|
| Variables   | test      | measuring unit | A     | STD  | The calculated value (T) | error percentage | Significance |
| Arm explosive force test  | Pre-test  | CM             | 3.98  | 0,22 | 1,03                     | 0.00             | Non-sign     |
|   | Post-test |                | 4.25  | 0.26 |                          |                  |              |
| Legs explosive strength test  | Pre-test  | CM             | 2     | 0.12 | 1,03                     | 0.00             | Non-sign     |
|   | Post-test |                | 2.10  | 0.12 |                          |                  |              |
| Arm strength test   | Pre-test  | REP            | 18.35 | 6.85 | 0,68                     | 0.00             | Non-sign     |
|   | Post-test |                | 21.25 | 7.88 |                          |                  |              |
| Leg strength test   | Pre-test  | REP            | 11.35 | 2.75 | 0,68                     | 0.001            | sgin         |
|   | Post-test |                | 13.55 | 2.88 |                          |                  |              |

View and discuss the results of the experimental group:

Table (3) the values of the arithmetic mean and standard deviations of the research variables for the experimental

| group                        |           |                |       |      |                          |                  |              |
|------------------------------|-----------|----------------|-------|------|--------------------------|------------------|--------------|
| Variables                    | test      | measuring unit | A     | STD  | The calculated value (T) | error percentage | Significance |
| Arm explosive force test     | Pre-test  | CM             | 4     | 0.23 | 11.63                    | 0.00             | sign         |
|                              | Post-test |                | 4.90  | 0.35 |                          |                  |              |
| Legs explosive strength test | Pre-test  | CM             | 1.97  | 0.16 | 11.63                    | 0.00             | sign         |
|                              | Post-test |                | 2.35  | 0.33 |                          |                  |              |
| Arm strength test            | Pre-test  | REP            | 19.62 | 6.59 | 12.41                    | 0.00             | sign         |
|                              | Post-test |                | 27.55 | 7.56 |                          |                  |              |
| Leg strength test            | Pre-test  | REP            | 12.25 | 2.79 | 12.41                    | 0.001            | sign         |
|                              | Post-test |                | 17.35 | 2.98 |                          |                  |              |

The test results show posteriori control and experimental groups and discussed:

**Table (4) the values of the mean and standard deviations for the dimensional tests of the experimental and control groups**

| Variables                    | Groups       | A     | STD  | The calculated value (T) | error percentage | Significance |
|------------------------------|--------------|-------|------|--------------------------|------------------|--------------|
| Arm explosive force test     | control      | 4.25  | 0.26 | 8.65                     | 0.00             | sign         |
|                              | experimental | 4.90  | 0.35 |                          |                  |              |
| Legs explosive strength test | control      | 2.10  | 0.12 | 7.85                     | 0.00             | sign         |
|                              | experimental | 2.35  | 0.33 |                          |                  |              |
| Arm strength test            | control      | 21.25 | 7.88 | 13.55                    | 0.00             | sign         |
|                              | experimental | 27.55 | 7.56 |                          |                  |              |
| Leg strength test            | control      | 13.55 | 2.88 | 11.55                    | 0.001            | sign         |
|                              | experimental | 17.33 | 2.98 |                          |                  |              |

Discuss the results

Table (4.3.2) shows the values of the arithmetic mean, standard deviations, and standard error of all research variables in the pre and post measurements during the period of applying the exercises method using the training device. It indicates the existence of significant differences in favor of the post-tests in all research tests, except for tests (explosive strength of the arms, explosive strength of the legs. Power tolerance for the arms) were not significant for the control group.

The researcher attributes these intangible differences to the effectiveness of the training apparatus and the nature of the exercises used according to the formation of loads for the physical abilities that the researcher used has a great impact in developing the characteristic of muscular strength, as it is necessary to use non-traditional training methods to increase the effectiveness of utilizing the functional potential of the athlete (: 5). What was mentioned by Raisan Khuraibet (where the development of the level of athletic

achievement is required to increase the load in quantity and quality to an extent that forces the athlete to adapt together in terms of physical and psychological to overcome the contradiction between the requirements of pregnancy and the ability of achievement (Raysan Khuraibet, 367), that the development of the explosive force of the arms led to the experimental group. The continuous training with the repetitions used in the curriculum prepared by the researcher on the proposed device for this exercise was to connect the handball player to the mechanism stage, "as the player reaches the skill performance and the optimal achievement automatically through permanent repetition in training" (1), and this is what The significance of the differences for the experimental group is justified in this test. The researcher agrees with the assertion of Hamdi Abdel Moneim and Mohamed Abdel Ghani (1999) that "the most important In order to legalize the training load used so that it is commensurate with the level of the trainee player and the goal of the training and to choose the appropriate breaks." (1) The muscle group working in this exercise has developed as the training load used on the proposed device has been codified in order to match the level of the players and the goal of continuous training in The development of the muscular strength of the arms, which had a positive effect on the development and development of the maximum strength of the arms, but in limited proportions, as the difference between the percentage of development of the experimental and control group and the interest of the experimental.

The researcher agrees with what Muhammad Reda Ibrahim asserts (2008), "The use of low training stimuli in training leads to a relatively level of development" (1).

As for the explosive strength test of the two men, there are significant differences and for the benefit of the dimensional tests in the experimental group, the researcher attributes these significant differences to the effectiveness of the training apparatus and the nature of the exercises used according to the formation of the loads of the physical abilities that the researcher used has a great impact in developing the characteristic of the muscle strength of the two men and that the nature of work on the training device depends On the individuality of performance, that is, each member of a sample.

The research has taken the full opportunity of training doses, and thus the development in the explosive power of the two men was positively reflected on the achievement of the members of the research sample by following the correct scientific foundations in terms of building training units in terms of intensity, size and comfort, and that the different leg exercises that were implemented from Before the members of the experimental group in order to develop the push up and this exercise is useful for strengthening the muscles of the legs while descending down and then up, and this is confirmed by Abu Al-Ela Ahmed Fattah and Ahmad Nasreddin Sayed (2003), "The development of explosive strength of the material muscles of the legs includes exercises that are characterized By the force characterized by speed, as it is used to push effectively against resistance, by means of muscle contraction during static action and to exert the maximum kinetic energy during kinetic action. The maximum energy or maximum force possible can be used during the moving method in the form of performing mechanical exercises (3).

As for the strength test for bearing arms, there are significant differences in favor of the post tests in the experimental group, and the researcher attributes these moral differences to the effectiveness of the training device and the nature of the exercises used, and therefore the use of assistive devices continuously and training with the maximum intensity of the device, and this is confirmed by Muhammad Reda Ibrahim, "The high achievement in sports competitions. It is the end result of hard training ... The adaptation of functional body organs and systems to the special requirements of the type of game or sporting activity the practice ... that is, the greater the degree of muscular adaptation, the better the athletic Achievement. Variable resistance exercises using the training device for developing working muscles in

handball have achieved an improvement in muscle efficiency and improved the level of achievement of the experimental group in the strength endurance test of the arms, as most of the first stages of the arms depend entirely on the development of the characteristic of rapid strength, speed and neuromuscular compatibility Which means an improvement in the ability of the working muscles to do such movements, and this was evident in the results of the experimental group, which indicates its superiority over the results of the control group. The researcher agrees with the mention of "Raisan Khuraibet and Ali Turki" (11: 262-263) that the requirements of modern training, including a large increase in training loads and a high percentage of intensity training, have added other difficulties to the possibility of optimally codifying the work and rest system with respect to each dose. Training and various training courses. And that the continuous use of auxiliary means, including the proposed device, has an effect on the development of endurance, and this is confirmed by Muhammad Reda Ibrahim, "that the high achievement in sports competitions is the final result of hard training ... and the adaptation of the body's functional organs and systems to the special requirements of the type of game or activity sporting practice." ... that is, the greater the degree of muscular adaptation, the better the athletic achievement "(1).

As for the strength endurance test for the legs, there are significant differences and for the benefit of the post-tests in the experimental group, the researcher attributed these significant differences to the effectiveness of the training device and the nature of the exercises used stems from the effect of training with different exercises that helped increase and develop the muscle strength of the two men, as this exercise is considered one of the daily basic exercises in the training units And in the game of handball, which is indispensable because it is the key to strengthening the legs and its benefits in correction as well as defending the area, and this is what (Ayan and Baroka) confirms that "downward bending exercises strengthen the leg muscles with high load" and these stresses are used for resistance exercises of the legs in isometric exercises for a period From (5-10) seconds and with different angles, such as by jumping half a beard or a quarter of a dip (squatting) in front and side. Also (Abu Al-Ela Ahmad Fattah and Ahmad Nasruddin Sayed) confirms that "Exercise using weights used by lifters is one of the most effective methods of training in developing ability. Dynamics, especially in the directions of maximum strength and explosiveness of the leg muscles "(2).

#### Conclusions and recommendations

##### First: Conclusions:

In light of the researcher's findings, he concluded the following:

1. The coaching apparatus has a positive effect on developing strength for young handball players
2. Training with short distances and stressing an approach or higher than the actual performance leads to an improvement in the level of explosive force as well as for carrying the strength of the arms and legs together.

##### Second: Recommendations

In light of the findings of the researcher, she recommends the following:

1. Using the training machine to develop the strength of young players with hand reel
2. When using the training device, the principle of gradual increase in the load must be taken into account, since the least resistance used in the device starts from (zero) and ends with (9 kg) in the form of a pull back resistance.

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