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The effect of competitive exercises using different resistances in the development of explosive power and speed-distinguishing power for advanced handball players

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Abstract---The goal of research is to identify the impact of competition exercises using different resistances in the development of explosive power and speed strength of handball players, as well as to recognize the morale of differences in the tests (pre-post) of these capabilities for the members of the search sample. The researchers used the experimental approach by designing the single group (experimental), with pre and post testing, and the research community consisted of (18) players from Iraqi clubs category women participating in the Qatar Club League for the 2020/2021 sports season divided into (sample of the reconnaissance group Mesopotamia Club 6 players) and (sample of the experimental group Erbil Club 12 players), the researchers used appropriate statistical means, as the statistical bag spss have been used. The researchers reached a set of conclusions, the most important of which was that competitive exercises using different resistances have a positive impact in the development of explosive strength and the distinctive strength of speed in advanced handball players, and in the light of the results obtained the researchers developed a set of recommendations, the most important of which is the need to use competitive exercises in physical abilities training, as well as training using different resistances and at appropriate weights for the abilities of the players.

Keywords---competition exercises, speed strength, handball players.

1- Introduction

Sports training has become a science based on scientific foundations and principles through which the best levels and results can be achieved in all sports events, and in order to raise the level of training status and reach high levels, it is necessary to understand more deeply what is contained in the foundations and rules of this science, as well as to shed light on all that is new and new in the field of training and its applications, and in handball the training planned in accordance with scientific principles and principles plays an important and essential role to get the player to the state of sports form at the end of the sport Preparation period (public and private) and retention during the competition period.

Handball is an exciting group game for both practitioners and viewers, which has expanded in many countries of the world because of its beauty in both individual and collective artistic performance, making it imperative for those concerned to take care of the skill requirements that must be observed when developing the exercises of the game and how to implement it to keep up with everything new, to parallel the development it has reached. The development in the field of sports and sports events can only be achieved through improving, developing and raising the level of achievement, which comes only by continuing the process of sports training based on the right scientific foundations. **(Laith Ibrahim: 2009: 35)**

Perhaps one of the most important reflections of the level of physical abilities of handball is its important and significant association in the performance of technical skills with handball, especially since the technical performance requirements of handball contribute to the physical abilities in it mainly as we see in the skill of shooting on the goal, which must be characterized by strength and speed as well as accuracy to be successful shooting and scoring a goal in the goal of the opposing team and so on the rest of the special skills in the game of handball.

Hence the importance of research in targeting an important physical requirement of the performance requirements of handball, which is explosive power and the distinctive strength of speed, by using competition exercises with a performance similar to the performance of the game with different resistances in the development of these physical abilities in handball players.

The problem of research was the weakness of the physical aspect in the group of women in general and in particular the element of strength, as well as the lack of use of modern and interesting methods of training such as competition exercises and reliance on traditional methods and methods in the training of women players and for many reasons difficult to account for now, so the researcher wanted experimentally to apply competition exercises to develop the physical abilities under study.

One of the objectives of the research was to identify the impact of competition exercises using different resistances in the development of explosive power and the distinctive strength of speed for handball players, as well as to recognize the

morale of differences in the tests (pre-dimension) of these two capabilities for the members of the research sample.

2- Research methodology and field procedures:

2.1 Research approach.

In conducting the research experiment, the researchers used the experimental approach to suit it in solving the research problem, and because there were multiple types of experimental designs, the researchers used the design of a single (experimental) group with pre and post testing.

2.2 Community and research sample.

The method of selecting a research sample is a requirement of scientific research because it is "the part that represents the society of the instruments or model that the researcher conducts as a whole and the focus of his work" **(Blocked: 1:1:1642)**. The researchers selected the research community in the deliberate manner of the players of the country clubs women's handball for the sports season (2020-20 21), and the number of community origin (140) players distributed to (10) clubs, while the research community numbered (18) players representing the percentage (12,85 %) from the community of origin divided into two groups representing the research samples, the reconnaissance group (Mesopotamia Club) and the experimental group (Erbil Club), and the number of members of the reconnaissance group (6) became representing 33.33% of the research community and the experimental group (12) players representing a percentage (66.66%) % from the search community after the removal of the goalkeepers, as shown in table (1).

Table 1 shows the percentage of the research community to the community of origin

Community of Origin		Research community	
Number of clubs	Number of players	Reconnaissance group sample	Experimental group sample
10	140	6	12
100%	100%	33,33%	66,66%

2.3 The devices and tools used in the research

- ❖ Laptop type calculator (Acer) number (1).
- ❖ Sony Type Manual Electronic Calculator Number (1).
- ❖ German-made electronic balance type (National) number (1).
- ❖ Measuring bar to measure lengths and distances length (10) m number (1).
- ❖ Phosphorous colored ribbons.
- ❖ A legal handball court.
- ❖ Medical balls weight (800 g) number (8), weight (1 kg) number (2).
- ❖ Heavy waistcoat (2kg) number (8).

Field search procedures.

Tests used in research.

After informing the researchers about scientific sources and references, it was found that the process of identifying tests that measure the variables in question is an important necessity that researchers must identify accurately and carefully to achieve research objectives, and has been determined according to the requirements of the research and selected what is appropriate for the research as follows:

1- Test the explosive power of the arms.

Test name: Medical ball throw test weighing (1 kg) from stand position. **Al-Sumaidai:2010: 268)**

Purpose of the test: measuring the explosive strength of the arms.

Tools- necessary: area of the ground, measuring tape, medical ball weighing (1 kg).

Test description: The laboratory stands behind the starting line (throwing) and the two men are fixed on the ground in parallel, throwing the medical ball forward at full force and speed (explosive movement).

Registration:

- Each laboratory is given two attempts to record the best.
- The throwing distance is recorded and counted in meters.
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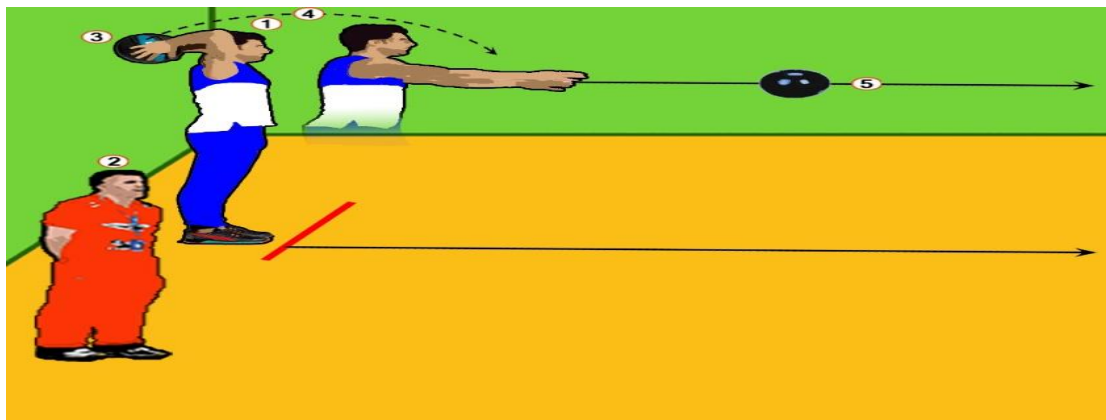


Figure 1 shows the explosive force test of the arms

2- Test the explosive power of the two men.

Test name: Wide jump test of stability. **(Khashali: 2012: 67)**

Purpose of the test: measuring the explosive strength of the two men.

Tools: Jump space divided by meters and centimeters to the end of the field, measuring bar, peeling pieces.

Test description: The laboratory stands behind the starting line and the feet are slightly spaced and parallel, and then the laboratory begins to swing the arms back with the knees bent and then jump forward as far as possible by extending the knees and pushing the feet with the arms weighted forward, and two attempts are given to each laboratory.

Registration: The measurement is from the starting line to the last part of the body that touches the ground, each attempt is measured to the nearest (5cm) and the laboratory is calculated as the best attempt.

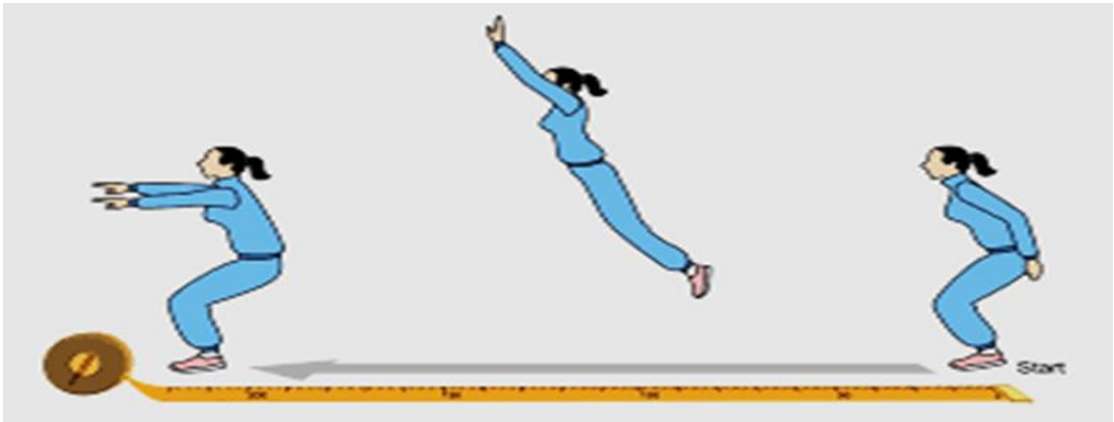


Figure 2 shows the explosive power test of the two men

3- Test the distinctive power of speed of the arms.

Test name: Front-base propulsion test for (10) seconds. (Hussein and Bastoisi:1979: 156)

The purpose of the test: measuring the characteristic strength of the muscles of the arms and shoulders quickly.

Test description: From the placement of oblique flatness (front base) the laboratory bends and extends the arms to the maximum possible time (10) seconds.

Conditions: Stop is not allowed during performance, the body is straightened during the performance stages, the need for the chest to touch the ground when bending the elbows, and extending the arms completely upon ascent.

Tsajil: The laboratory records the number of healthy attempts during the time of the (10) seconds it has made.

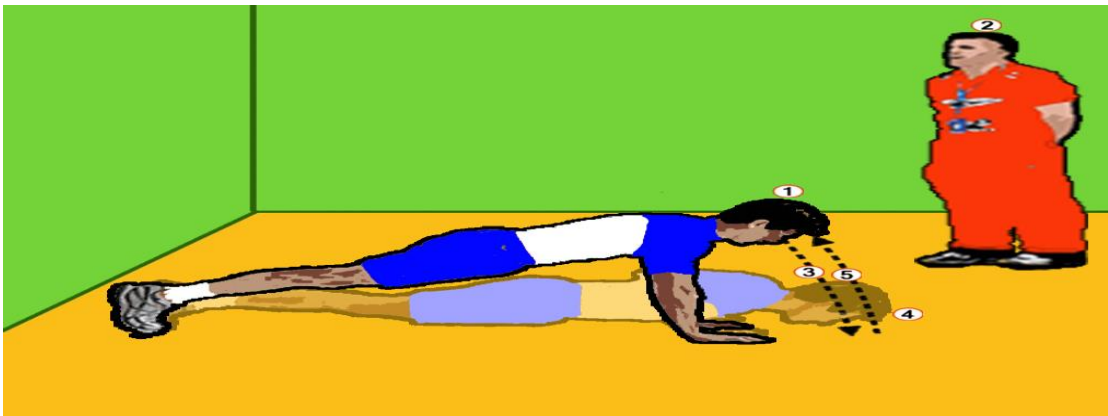


Figure 3 shows the speed strength test of the arms

4- Test the distinctive power of speed for the two men.

Test name: Partridge test maximum distance within (10) seconds. **(Bastoi: 2014: 80)**

The purpose of the test: measure the distinctive strength of the speed of the two men.

Tools used: flat space floor, measuring tape, stopwatch, whistle, chalk.

Test description: The laboratory stands on the starting line and when the start whistle is heard and the clock starts, the laboratory starts with the partridge at full speed from the moment the start whistle reaches (10) seconds, and the distance travelled by the laboratory during the test time is calculated.

Registration: The measurement is made for each man individually and the rate is calculated for the two grades of each man.



Figure 4 shows the power test at speed

2.5- Reconnaissance experiment

On 2 January 2022, on Sunday, ResearcherWen conducted the reconnaissance experiment in the Hall of the Late Ali Salam in Diyala province at 3:00 p.m. on (6) female players from Mesopotamia Sports Club handball for women, and the experience was related to physical tests, in addition to applying competition exercises using special weights inside a waistcoat worn by female players during the exercise in order to determine the appropriate weights for women players in addition to the use of medical balls and choose the right weight to perform Exercises by female players to not influence the motor tracks to perform the game skills.

Pre tests

ResearcherWen conducted pre tests for the research sample of the experimental group, represented by the team of Erbil Sports Club handball for women on Wednesday, 5 January 2022 at 3:00 p.m. on the closed hall of Salaheddine University in Erbil province, and researcherWen took into account the stabilization of the spatial and temporal conditions of the tests and the way they were conducted with the help of the auxiliary team in order to achieve the same conditions as much as possible when retesting, knowing that the tests were carried out from Accepted by the auxiliary team and supervised by ResearcherWen.

The main experience.

2.7.1- Competition exercises.

These exercises included a range of bilateral, triple and quadruple competition exercises with a positive competitor (defender) and performance similar to the requirements of the handball game in the games, the aim of which was to develop physical abilities, and the researcher took into account the progression and ripple in training loads by controlling the components of the training load of performance time, degree of difficulty, weight weights for exercise and the number of repetitions. The rest periods, which were limited to (2-9) minutes and their association with the rest of the load components, taking into account individual differences according to the specificity of the handball game for the events of the required training ripples.

The size of the training dose for competition exercises ranged from (23-36 minutes), and the number of special training doses in the research was (24) training doses divided into (8) weeks by (3) training doses per week making the total amount of exercise used. Minutes, and the training days were Saturday, Monday and Wednesday, and since the research sample is from the players of the advanced qatar clubs and the goal of the research to get them to the best physical level specialized researchers resorted to the methods and training methods indicated by the research and references that develop these abilities, as the researcher used special training methods in the development of physical abilities according to this training method. This is the method of high intensity fitri training as well as the method of repetitive training, and since the training of these abilities associated with the rather high arousal processes of muscle contractions is difficult and stressful, the process of diversification and change in methods and training methods is necessary to reduce the stress caused by training and according to the requirements of the handball game, since " Each sports activity is characterized by a special type of physical, skilled, planned and mental abilities governed by its own law and thus requires a special quality of training and a variety of methods of training commensurate with the nature of the competition" (**Rug: 1998: 66**).

The approach included a range of competition exercises with various offensive formations with positive defenders such as (2 against 1, 2 against 2, 3 against 2, 3 against 3, 4 against 3, 4 against 4), as the researcher baptized. They used medical balls (800 g) and heavy waistcoats (2 kg), which were distributed to training doses so that the application of physical exercises using weights and medical balls was four exercises per training dose.

2.7.2- Applying competition exercises.

Competition exercises were applied to the experimental research sample from Saturday, January 8, 2022 to Wednesday, March 2, 2022, with three training doses per week, with the curriculum extending for eight weeks. The application of competition exercises by the players in the same training unit started with the warm-up process within the specified time of the preparatory section to prepare well for the performance of physical exercises and after the completion of taking the training dose for the application of the competition exercises, the players move to the rest supplement. The vocabulary of the training unit with Mr. Trainer, the gradual application of exercises was taken into account by the researchers,

who adopted the scientific methods and training foundations adopted in the sources of sports training science, including the principle of gradient in the intensity of training loads for training doses, as researcherWen used the principle of ripple training pregnancy (1:3) and with training intensity (75%-100%).

2.8- Post tests.

After notfinishing applying the competition exercises over an eight-week period, the post tests of the research sample, the experimental group, were conducted on Friday, 4/3/2022 at 3 p.m., and researcherWen followed The same pre testing requirements and procedures in terms of location, time, tests used, sequence, tools used and auxiliary team to maintain that there is no change that may affect search results.

Statistical means.

Researcher Wen used the most appropriate statistical methods with the importance of studying research, which achieves the objectives and assumptions of the research, as they used the statistical bag (spss).

3- View and discuss test results.

3.1- Presentation and discussion of the results of the test (pre-post) forphysical abilities.

Table (2) shows the descriptive statistics of the experimental group in physical capacity

Variables	Unit of measurement	auditions	Arithmetic medium	N	Standard deviation	Standard error
Explosive force arms	meter	Pre test	4.967	12	0.470	0.136
		Post test	7.983	12	0.712	0.206
Explosive force of two men.	Centimeters	Pre test	113.750	12	13.838	3.995
		Post test	145.000	12	14.796	4.271
Distinctive power at speed two arms	reiteration	Pre test	9.083	12	1.564	0.452
		Post test	14.000	12	2.089	0.603
Two men's speed.	meter	Pre test	24.833	12	2.691	0.777
		Post test	33.500	12	3.205	0.925

Table (3) shows inference statistics between the (pre-after) test of physical abilities

Variables	Unit of measurement	Q-F	P	Standard error	T	Error rate	Significance
Explosive force arms	meter	-3.017	0.866	0.250	12.069	0.000	Moral

Explosive force of two men.	Centimeters	-31.250	12.556	3.625	8.621	0.000	Moral
Distinctive power at speed two arms	reiteration	-4.917	1.975	0.570	8.623	0.000	Moral
Two men's speed.	meter	-8.667	2.535	0.732	11.845	0.000	Moral

* Moral at a fault rate below (0.05)

3.2- Discussing the results of the (pre-post) test of physical abilities

Through what was presented in table 3, which showed us that there are moral differences between the pre and post tests of the experimental group in physical abilities and in favor of the post test, which is inferred from the error rate of the tests, which is less than (0.05) and for all physical abilities, as this indicates that there is a development in these abilities (explosive force of arms and legs, the force characterized by speed of arms and legs) in members of the experimental group, and the researchers attribute This development caused the effectiveness of the competition exercises in the training curriculum and its positive impact on the level of physical abilities as the physical requirements of the handball player were taken into account in the design of these exercises, as the use of various resistances in these exercises to develop variables of explosive power and distinctive strength at speed has played an effective role in the development and development of these two physical abilities, as confirmed by **Laith Ibrahim** In addition, the resistance used, which is heavy bras and medical balls, has been prepared on sound scientific grounds in terms of appropriate weights for the sample as well as targeting the characteristic or ability to be developed and through the performance of competition exercises in which all the skills of the game are included. And work to repeat its performance throughout the periods of the training curriculum and with the presence of these resistances as well as the use of the legal ball and the frequency of maneuvers and jumping and correction, which was worked within the limits of the phosphagenic energy system to develop the explosive power and the distinctive strength of speed of the arms and men because of their great role in the requirements of performance handball led to the development of the strength of the muscles of the two men and arms, which is confirmed by both **(tailor and life)**) that "medical balls can be selected appropriately to work with in order to strengthen the muscles of the arms and the group of muscles working in the motor performance of handball skills" **(Tailor and Life: 2001: 439).**

"Explosive power and speed-driven power play a big role in the performance of handball skills, as they are critical elements in many matches and depend on them for achievement and performance efficiency" **(Tailor and Vitaly: 2001: 429)** The researchers also believe that the numbers of the player in the physical aspects, especially explosive force and the distinctive strength of speed should be taken into account, and that the exercises of handball aimed at developing the

muscle groups working in the game and most importantly to ensure as much as possible that the development and preparation of these groups with dynamic paths similar to the performance of the handball game, as the **Sudanese Ahmed** believes that "Explosive and fast power exercises must be integrated into your setup with offensive moves or by exercises associated with game skills" (**Sudanese: 2009:89**).

The researchers also believe that the reason for the development in these two abilities is due to the exercises given during the training curriculum was appropriate for the sample level in terms of intensity, size and comfort, and this is what (**Mahmoud Abdullah**) sees as "giving exercises according to the correct scientific method enhances the increased efficiency of work for the muscle groups involved in the performance of various motor skills and physical abilities acquired by the player during training" (**Abdullah and others: 1991: 42**). "The development of any physical component does not happen if there is no harmony and physical and natural adaptation between the players and the components of the training process in terms of quantity and quality on the one hand, the level of the players and their age phase on the other" (**Al-Basati: 1998:21**). This is what the researchers worked on in the application of competition exercises, relying on motor exercises and sub-maximum resistances and with different accelerations up to the maximum possible acceleration of the members of the research sample and this is in line with the training requirements for the development of explosive power and distinctive strength with speed, the idea of hand is one of the games that relies heavily on the various exercises of these two physical abilities.

4- Conclusion

In light of the findings, the researchers concluded that competitive exercises using different resistances have a positive impact on the development of explosive strength and rapid strength in advanced handball players, in addition to integrating resistance exercises with the motor performance of the game's skills has an impact on the development of physical abilities. The researchers therefore recommended that competitive exercises should be used in physical ability exercises, as well as training using different resistances and at appropriate weights for female players' abilities. In addition to adopting competition exercises in the training curriculum to develop the performance requirements of handball players.

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Supplements.

Supplement (1)
Some of the exercises used in the search

