

**Effect Of Qualitative Exercises Using The (Vertimax) Device To Developing
The Explosive Ability Of Arms And Legs And The Skill Of Long-Shooting
For Youth In Handball**

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Abstract: The importance of the research was to prepare qualitative exercises using the device (Vertimax) to develop the explosive ability of the arms and legs and the skill of long- shooting for young handball players. As well as knowing the effect of specific exercises using the device (Vertimax) to develop the explosive ability of the arms and legs and the skill of long-range shooting for young handball players. While the problem of the research was that there was a weakness in the explosive ability and the far shooting, so the player needs a high level of the explosive ability of the arms and legs in order to succeed the far shooting. Therefore, the researchers decided to develop specific exercises using the (Vertimax) device to develop the explosive ability of the arms and legs and the skill of long-range shooting for young handball players. As for the objectives of the research, it was to prepare qualitative exercises using the (Vertimax) device to develop the explosive ability of the arms and legs and the skill of long-range shooting for young players in handball. As well as knowing the effect of these specific exercises to develop the explosive ability of the arms and legs and the skill of long-range shooting for young handball players. As for the most important conclusions, it was represented that the specific exercises used on the device (Vertimax) have a positive effect on the development of the explosive power of

the arms and legs and the skill of long-range shooting for young handball players. Therefore, the researchers recommend the need to use specific exercises using the (Vertimax) device to develop the explosive power of the arms and legs and the skill of long-range shooting for young players in handball.

Keywords: (Vertimax) device, explosive ability, long-shooting.

1. Introduction

The astonishing progress witnessed by various sports in the world has reached high levels of performance and achievement, certainly due to the trainers' dependence on the sound scientific bases of the science of sports training, keeping pace with them, and their quest to discover more different training and scientific methods and means, as well as revealing the prevailing theories of the science of sports training and contributing to the development of And the development of the elements of physical fitness and raising the level of general physical fitness, which in turn leads to the development of the technical, tactical and psychological performance of the player in various sports. Therefore, specialists, researchers and workers in the sports field had to find everything new to take advantage of in supporting sports events to keep pace with the development taking place in them.

The handball game is one of the games that need the physical and skill sides, two aspects that are constantly in dire need of the muscular strength of the arms and legs, which gives the privacy of strength to the players of this game, as the player needs the strength of the legs and arms in jumping and fast sprinting, as well as the strength of the arms in shooting, And the performance of skills, especially those that require degrees of difficulty close to the maximum in their performance, as it is imperative for the handball player to perform these skills with the strength required to perform the goal to be performed as we see in the skill of shooting from afar, which is very important and which must be characterized by strength as well as accuracy to be Shooting success and scoring a goal against the opposing team.

The view of modern training has become to pay attention to all aspects, whether physical or skill, to achieve the required level through the use of modern training methods that are more specialized away from general and traditional methods and tools. With the high training intensity of the exercises inside the training unit, it imposes high intensity on the devices of the body, as well as accustoming the players to continue performing for as long as possible and facing fatigue during training and matches, the importance of the research by preparing

specific exercises using the Vertimax device in developing the explosive ability of the arms and legs that contribute to the performance of the skill of long-shooting for young players in handball, being one of the critical skills in the match because it is a difficult skill and its performance requires special explosive abilities to produce the best performance.

The game of modern handball is characterized by speed and strength of performance throughout the match period, and this requires players to possess a high level of physical and skill capabilities that qualifies them to continue to perform positively until the end of the match and achieve victory, Through the researchers' experience as they are former players and trainers for this game and their current presence in the scientific and practical field and their continuous follow-up to Al-Qasim Handball Sports Club, they noticed a weakness in the explosive ability and far shooting, as well as the great development of defensive skills and defensive skills, which made it difficult to penetrate the players from the near shooting area This gave importance to the long shot from jumping high, as it is performed from outside the free-throw area (9 meters), which is the distance away from the goal. Therefore, the player needs a high level of explosive ability of the arms and legs in order to succeed in the far-shooting, so the researchers decided to develop specific exercises using the (Vertimax) device to develop the explosive ability of the arms and legs and the skill of far-shooting for young handball players.

2. Methods

The researchers used the experimental method because it fits the nature of the research problem. The researchers determined by choosing the research community with Al-Qasim Handball Club players for the season 2021-2022 AD, which numbered (20) players.

a. The homogeneity of the sample The equivalence of the two research groups:

To complete the requirements of the experimental design followed, the researcher resorted to achieving homogeneity among the members of the research sample, and in order to reach a fixed level for the research sample and to avoid indicators that may affect the results of the research in terms of the individual differences that exist between the handball players, the homogeneity of the two groups was carried out using the torsion coefficient in terms of (height, mass, age, training age), The results of the homogeneity of the two research groups showed a normal distribution, and then there

were no anomalous values, as the skewness coefficient values were limited to (± 1), as shown in Table (1). In order for the researchers to attribute the differences to the experimental factor, parity was conducted between the two research groups in the tests of the studied variables, as the appropriate statistical method was used, represented by the (t-test) for independent samples in which the significance level value appeared. Confirms the equivalence of the two research groups, as shown in Table (2).

Table (1) The homogeneity of the study sample in the extraneous variables.

Variables	Mean	Std. Deviation	Mode	Skew ness
Length	177.12	4.16	175	0.50
Mass	76.38	5.41	77	0.11
Age	17.05	1.06	17	0.04
Training age	6.11	2.02	5	0.54

Table (2) The equivalence of the two research groups, the control and experimental, in the studied variables.

N	Tests	Experimental		Control		T value	Sig level	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation			
1	Vertical jump test	37.29	2.73	38.48	2.61	1.47	0.629	Non Sig
2	Throwing a medicine ball weighing (800)gm from sitting on a chair with the preferred arm	7.62	1.11	7.88	1.26	1.58	0.736	Non Sig
3	Accuracy of shooting from jumping high by taking three steps on the accuracy squares (50 x	2.48	0.83	2.63	0.89	0.73	0.527	Non Sig

50 cm) with four lamps behind each square With sports radar								
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Table (2) shows that the values of (Sig) are greater than the level of significance (0.05), which means that the differences were random between the two research groups in some of the studied variables, and this indicates the equivalence of the two groups.

b. Means, tools and devices used:

- Arab and foreign sources. - Tests and measurements. Two (2) American-made Vertimax devices. One (1) video camera at a speed of (150) r/s. - 1 (HP) Korean laptop, hand-held electronic calculator (CASIO).- Legal handball court.- Whistle (2).- Adhesive tape measure for planning the stadium and determining the test areas.- Correction boxes (50 x 50).) cm attached to the goal.- Radar device for measuring ball speed, number (1).- Legal hand balls (16).- Plastic cones of different sizes (10). 8).

c. Field research procedures:

1) Determining the validity of the tests of the explosive ability of the legs and arms and the skill of long-shooting handball:

For the purpose of determining the validity of the explosive ability tests for the legs and arms and the skill of long-shot handball for young players, and after the researcher reviewed the various and diverse scientific sources, the tests were determined and presented to the (13) experts and specialists in the field of handball. in Table (3).

Table (3) Shows the validity of the explosive ability tests of the legs and arms and the long-shooting handball.

N	Defensive skills	Validity		Ka ²	Sig type
		Validity	Non Validity		
1	Vertical jump test	13	0	13	Sig
2	Sargent's Vertical Jump Test	7	6	0.07	Non sig
3	Throwing a medicine ball weighing (800)gm from sitting on a chair with	12	1	9.30	Sig

	the preferred arm				
4	Throwing a handball to the farthest distance	4	9	1.92	Non sig
5	Accuracy of shooting from jumping high by taking three steps on the accuracy squares (50 x 50 cm) with four lamps behind each square With sports radar	13	0	13	sig
6	Shooting from a distance of 9 m in one step on the accuracy squares	7	6	0.07	Non sig

2) Exploratory experience:

The researchers conducted the exploratory experiment on (4) players from Al-Qasim Club, youth handball category, after (7) days, the reconnaissance experiment was repeated on (22 | 4 | 2022) on the same individuals and under the same conditions, and the aim was to:

- 1) Ensure the efficiency of equipment and tools.
- 2) Knowing the time taken for each test, as well as the time of the total tests.
- 3) The level of difficulty of the tests for the research sample.
- 4) Knowing the difficulties that the researchers face in order to avoid them in the future
- 5) Knowing the best area that gives the correct reading and the best location for the device.

d. Scientific basis for the tests:

1) **Test Validity:** Validity is “the accuracy with which the test measures the purpose for which this test was developed” (Kmarsh, Youssef Lazem, 2002, p.149). For the purpose of extracting the validity of the candidate tests, the researchers presented the contents of the tests to a group of experts, and thus the researchers obtained the validity of the content.

2) **Test Reliability:** In order to extract the reliability coefficient for tests, the principle of the constant test must be applied, "which gives close results or the same results if applied more than once in identical conditions" (Al-Zayoud, Nader Fahmy & Alyan, Hisham Amer, 2005, p.145) . It was used to calculate the reliability coefficient by (test and re-test method) with an interval between the first and second tests (7) days. The researchers extracted the reliability coefficient by means of

Spearman's correlation coefficient for the ranks between the results of the first test and the second test, and extracted the significance of the correlation by means of the statistical method (TR) for the significance of the correlation as shown in Table (4).

3) Objectivity: Objectivity is defined as “the extent to which the arbitrator or examiner is liberated from subjective factors” (Farhat, Laila,2001, p.169).The researchers used the Spearman correlation coefficient for the ranks of the objectivity of the tests between (the degrees of the first judgment and the second judgment)* as shown in Table (4).

Table (4) shows the reliability coefficient and the objectivity coefficient of the tests.

N	Tests	Reliability coefficient	T value	Sig	objectivity coefficient	T value	Sig
1	Vertical jump test	0.93	0.000	Sig	0.95	0.000	Sig
2	Throwing a medicine ball weighing (800)gm from sitting on a chair with the preferred arm	0.85	0.000	Sig	0.88	0.000	Sig
3	Accuracy of shooting from jumping high by taking three steps on the accuracy squares (50 x 50 cm) with four lamps behind each square With sports radar	0.91	0.000	Sig	0.92	0.000	Sig

e. Pre-test: The researchers conducted pre- tests for the research sample on (30/4/2022) before starting the main experiment with controlling all variables.

f. Implementation of specific exercises using VERTIMAX:

The researchers prepared qualitative exercises using VERTIMAX to develop the explosive ability of the legs and arms and the skill of shooting from the distance for young handball players, starting with the implementation of the exercises on (1/5/2022) until (30/6/2022). Specific exercises were applied in the special preparation stage. The duration of the

exercises is (8) weeks distributed over (24) training units at a rate of three training units per week (Saturday - Monday - Wednesday). Specific exercises were given at the beginning of the main part of the training unit, after completing the exercises, they are merged with the control group to complete the training unit for them under the supervision of their coach. The exercise time reached (36 - 43) minutes of the training unit size. The researchers used the high intensity interval training method. The selected exercises were implemented in a variety of ways and constantly changing. The researchers determined the intensity of the exercises between (80-95%) and the researchers used the principle of ripples in giving weekly exercises (1:2) that is, using a week of high pregnancy and two weeks of pregnancy less high. With the instructions of the device, which has been set by the device makers with examples of how to determine the intensity, as they put certain stresses and the corresponding angular tension in pulling the rope, and through that, the researchers facilitated the process of putting the intensity on a device by converting the ang to the centimeter and extracting (1%) of the intensity and the corresponding pull on the rope, as follows: For explosive strength exercises, each (1%) intensity corresponds to (0.5 cm). If the training intensity is (80%), the resistance of the rope will be pulled ($80 \times 0.5 = 40$) cm. The training intensity for some exercises was also determined by determining the number of maximum repetitions To perform according to a specific time, and extract the training intensity for it, either at the expense of time or repetition.

g. Post-tests:

The researchers conducted the post tests (the explosive ability of the legs and arms and the skill of shooting far with handball) in the closed hall of the Al-Qasim Youth Forum on (1/7/2022) with the same steps and conditions in which the tests were conducted (approximately).

h. Statistical means: The researchers used the statistical bag (spss) in analyzing the research results, including:

Arithmetic mean. Standard deviation, mode, skew modulus. -= Test (t) for correlated samples. - Test (t) for independent samples - Ka^2 .

3. Presentation, analysis and discussion of the results:

a. Presenting the results of the pre and post tests of the explosive ability of the legs and arms and the skill of long-shooting handball for the control group:

Table 5. shows the mean and standard deviation values for the pre and post tests and the calculated t value for the results of the tests (control group):

N	Tests	Pre-test		Post-test		T value	Sig level	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation			
1	Vertical jump test	38.48	2.61	40.26	2.17	2.49	0.000	Sig
2	Throwing a medicine ball weighing (800)gm from sitting on a chair with the preferred arm	7.88	1.26	9.10	1.15	2.16	0.000	Sig
3	Accuracy of shooting from jumping high by taking three steps on the accuracy squares (50 x 50 cm) with four lamps behind each square With sports radar	2.63	0.89	3.87	0.61	2.01	0.000	Sig

Table (5) shows the values of the means and standard deviations between the pre and post tests for the control group, and through our observation of the arithmetic means and standard deviations, we see that they are different between the two tests , accordingly, the researchers used the t-test for the correlated samples. The calculated t-values appeared significant for all tests because the (sig) value is less than the significance level (0.05), and accordingly there is a preference for the post-tests.

b. Presenting the results of the pre and post tests of the explosive ability of the legs and arms and the skill of long-shooting handball for the experimental group:

Table (6) shows the mean and standard deviation values for the pre and post tests and the calculated t value for the results of the tests (experimental group).

N	Tests	Pre-test		Post-test		T value	Sig level	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation			
1	Vertical jump test	37.29	2.73	48.18	2.23	7.44	0.000	Sig
2	Throwing a medicine ball weighing (800)gm from sitting on a chair with the preferred arm	7.62	1.11	11.60	1.95	6.18	0.000	Sig
3	Accuracy of shooting from jumping high by taking three steps on the accuracy squares (50 x 50 cm) with four lamps behind each square With sports radar	2.48	0.83	4.90	0.71	4.80	0.000	Sig

Table (6) shows the values of the arithmetic means and standard deviations between the pre and post tests of the experimental group, and through our observation of the arithmetic means and standard deviations, we see that they are different between the two tests, accordingly, the researchers used the t-test for the correlated samples. The calculated t-values appeared significant for all tests because the (sig) value is less than

the significance level (0.05), and accordingly there is a preference for the post-tests.

c. Presenting the results of the post-tests of the explosive ability of the legs and arms and the skill of long-shooting handball for the two experimental control groups:

N	Tests	control		experimental		T value	Sig level	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation			
1	Vertical jump test	40.26	2.17	48.18	2.23	6.85	0.000	Sig
2	Throwing a medicine ball weighing (800)gm from sitting on a chair with the preferred arm	9.10	1.15	11.60	1.95	4.30	0.000	Sig
3	Accuracy of shooting from jumping high by taking three steps on the accuracy squares (50 x 50 cm) with four lamps behind each square With sports radar	3.87	0.61	4.90	0.71	3.07	0.000	Sig

Table (7) shows the values of the arithmetic means and standard deviations between the post-tests and for the two experimental and control groups. Through our observation of the arithmetic means and standard deviations, we see that they are different between the two tests. Therefore, the researchers used the t-test for independent samples. Significance (0.05), and accordingly there is a preference for the experimental group.

4. Discuss the results:

Through what was mentioned in the previous tables, there are significant differences between the tribal and remote tests and in favor of the post tests for the two groups (control and experimental) for tests of the explosive ability of the legs and arms and the skill of long-range shooting in handball. The researchers attribute the development of the control group to the effect of the regular approach set by the coach, in addition to the players' continuity and regularity in training, which had a clear role in the development of motor abilities. Saad Mohsen asserts, "The opinions of experts, no matter how different the sources of their scientific and practical culture are, that the training program inevitably leads to the development of achievement, if it is built on a scientific basis in organizing and programming the training process, using appropriate intensity and gradation, observing individual differences, as well as using optimal repetitions and effective inter-rest periods under the supervision of Specialized trainers under good training conditions in terms of place, time and tools used (Ismail, Saad Mohsen, 1996, p. 98) . Sardar Hakim also states, "The organized physical preparation of youth and youth is the cornerstone on which every activity depends, because comprehensive development is the only guarantee for achieving scientific and sports results (Muhammad, Sardar Hakim, 2014, p. 72). The results also showed that there are significant and preferential differences for the experimental group in favor of the post-test, and the researchers attribute the reason for this development to the effect of exercises using the device (vertimax), Which were prepared by the researchers, as these exercises contributed to the development of the explosive ability of the legs and arms and the skill of long-range shooting with handball. This was confirmed by (Qasim Hassan) that "special or specific exercises contain one or several elements of effectiveness similar to the movement or close to it in the direction of movement or the strength of the movement" (Hussein, Qasim Hassan, 1998, p. 280). Knowing that these exercises have a great role in improving the explosive ability and improving the motor and skill path, and this is what (Hara) indicated, "The exercises serve to direct the integration of the level of fitness of a particular element as well as the ability to compatibility and a technical or tactical element and link it to building the quality of creation and psychological qualities of competition" (Hara, 1990, p. 90). The researchers also attribute the significant differences between the two measurements before and after training in tests and in favor of the post-training of the experimental group, to the nature of the exercises used in the method (VertiMax), as these exercises included strengthening the

muscles of the center of the body for handball players, through the use of resistances for that method, as the muscles of the center are the basis for connecting the upper extremities to the lower extremities. In increasing the amount of physical capabilities, especially muscular strength resulting from muscular contractions, whether they are eccentric or central, and mobilizing the largest possible number of motor units to perform the skill of shooting, in addition, these exercises worked on the compatibility between the work of the legs and arms, which led to an increase in the compatibility of performance requirements in the neuromuscular aspect, and this was confirmed by (Jamal Sabri) in the training of physical capabilities. That the particular development of a biokinetic susceptibility is systematic, directly or indirectly affecting other aptitudes” (Farag, Jamal Sabri, 2018, p. 481). The superiority of the post-test over the pre-test in terms of physical and skill abilities is due to the content of the exercises given to the sample prepared by the researcher, which was effective and effective. The player gains muscle strength, which in turn leads to reaching the optimal motor path in the implementation of duties while shooting. This was confirmed by (Mohammed Al-Daysti) "that the use of modern devices and tools is one of the most important methods or alternatives to increase the effectiveness of the training process, which contributes to the development of shortcomings" (Awad, Muhammad Al-Dusti, 2015, p.7). Also, the skill of long-range shooting with handball depends to a large extent on the explosive ability, due to the nature of performance in this skill, as the exercises using the Vartmex device worked to develop the explosive ability of the arms and legs, which led to an improvement in performance with the skill of shooting, and this was confirmed by (Jihan Ahmed Badr) the necessity of using ropes Rubber in skills that depend on explosive ability.

5. Conclusions and recommendations

a. Conclusions

The specific exercises used on the device (Vertimax) have a positive effect on the development of the explosive power of the arms and legs and the skill of long- shooting for young handball players.

The style adopted by the coach has a positive effect on the development of the explosive power of the arms and legs and the skill of long- shooting for young handball players.

The specific exercises used on the device (Vertimax) have the advantage in developing the explosive power of the arms and legs and the skill of long- shooting for young players in handball.

The organization of the exercises and the excitement that the training program contained contributed to the effectiveness of the implementation of the vocabulary exercises by the players, and their continuous commitment throughout the program period contributed and was reflected in the physical and skill performance of handball players.

b. Recommendations

The necessity of using specific exercises using the (Vertimax) device to develop the explosive power of the arms and legs and the skill of long-shooting for young handball players.

It is necessary to conduct a periodic evaluation to know the extent of the development of the level of physical and skill performance of the players.

The use of the (Vertimax) device in other characteristics, capabilities and activities because of its broad horizon in the exercise and training processes.

Conducting studies and other research for age groups and both sexes to build a basic base of capabilities for players in the initial preparation stage for them.

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