The effect of using plyometric water exercises on some basic skills for handball players

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Introduction and research problem

We live now in a new era in which everything has changed due to the tremendousprogress in science and technology and using modern tools and devices, which made many try to modify and develop in all areas. Among these areas is the field of training because of its significant and clear impact in helping to prepare generations which go along with that development and progress.

Marwan Ali (2003) mentions that plyometric exercises are one of the methods that increase the ability of muscles to explosive performance thus it increases the speed of motor performance, as the strength gained from these exercises leads to faster and more explosive performance for the range of movement (21:5)

khayriya Ibrahim and others (2001) mentions that in recent times awareness has increased and belief in the importance and usefulness of exercises within the water medium has spread, as it is now considered one of the latest methods in the world, where warm-up exercises or physical exercises within the water medium play an important role as one of the branches of alternative medicine. It works as a preventive medicine and physiotherapy in the face of many cases of injury treatment or rehabilitation after injury and general fitness for health and development of agility in addition to raising the level of special fitness for some activities (6:38)

Abu El-Ala Abdel-Fattah, Ahmed Nasr El-Din (2003), Khayriyah Ibrahim and others (2001) agree that training in the water environment is an effective way to increase the number and types of exercises, and that one of the characteristics of training within the water environment is that the body is free in weight, as The density of water is heavier than the density of air. When the arms or legs move inside the water, they meet with great resistance. This resistance can be used to strengthen the muscles, increase the range of motion in the joint and gain more strength (1:243) (6:52)

In view of the effectiveness of the plyometric training method and the positive results achieved by the studies that dealt with it, the researchers believed that it is possible to integrate the performance of plyometric exercises within the water medium to benefit from both methods to avoid injuries resulting from the performance of plyometric exercises on the ground.

The researchers believe that the current study is not the first of its kind, but was preceded by other studies that dealt with one or more aspects of the problem, including studies aimed at identifying the effect of plyometric training within the water medium on physical aspects, such as the study of “Asmaa Muhammad” (2003) (3) and the study of “Tamer Muhammad” (1999) (5), or on technical skillful aspects such as the study of “Nermin Muhammad (2003) (24), the study of “Iman Farouk” (2010) (4), the study of “Rham Fadl” (2018) (8), or on the aspects Physical and skillful studies, such as the study of “Mahmoud Abdel Mohsen” (2018) (20), and there are studies aimed at comparing training in the water medium and ground exercises, such as the study of “Muhammad Khalil” (2014) (19), and the study of “Hassannezhad, H.all” (2012). (28) And the results of all these studies were unanimous on the effective effect of training within the water medium, whether this effect was directly on the physical variables, or through the indirect effect of the transmission of the effect of training on the skillful level and other variables that were targeted to be studied.

It is noted that these studies unanimously agree on using the water medium as a training environment to exploit and invest the benefits associated with its use to achieve training gains. Which drew the

researchers' attention to the importance of legalizing the resistance of the water medium, whether through the water level, the nature of standing and the movements carried out inside the water medium, as well as directing training to specific areas of the body (arms / legs / torso...), which is what has been taken into account and taken care of in this studying.

From the previous perspective, the researchers believe that training within the water medium is an interesting, influential and effective method for developing skillful qualities and increases the players' ability to appreciate their skillful qualities in light of realizing the strengths and weaknesses of these qualities, and increases the motivation for training, raising morale and a way to get rid of boredom. The aquatic environment is an attractive environment for practicing the sports activity in addition to its positive impact on the aspects, skills and psychological that result from water resistance during performance. This is what prompted the researchers to conduct this research, which is an attempt to prepare a proposed training program to know the effect of using plyometric water exercises on some basic skills of handball players.

Research objective

This research aims to prepare a training program using the plyometric exercises for handball players, and to know its effect on the skillful variables under study.

Research hypotheses

1- There are statistically significant differences between the mean of the pre and post measurements and the rate of change of the control group in the skillful variables under study in favor of the post measurements.

2- There are statistically significant differences between the mean of the pre and post measurements and the rate of change of the experimental group in the skillful variables under study in favor of the post measurements.

3- There are statistically significant differences between the means of post measurements and the rate of change for the experimental and control groups in the skillful variables under study in favor of the experimental group.

Research terms:

Hydro plyometric exercises:

Muhammad Khalil (2014) defined it as physical exercises performed in the water, either freestyle or using tools or some swimming methods, in order to develop some special physical abilities and skillful levels (19:7).

Research plan and procedure

Research Methodology

The researchers used the experimental method for its relevance to the nature of this research by using the experimental design of two groups, one is experimental and the other is control, by applying the pre and post measurements for both of them.

Research community

The research community included the students of the fourth year in the Department of Team Sports and Racquet Games for the academic year 2021-2022.

The research sample

The research sample was chosen in a deliberate way from the students of the handball specialization whose number was (20) students, and they were divided into two groups, one is experimental and the other is control, with (10) students for each sample. Also they asked (40) students from other specializations for the exploratory study and calculate the scientific coefficients for the tests under study.

The distribution of the research sample individuals moderately:

The researchers made sure of the moderation of the distribution of the members of the control and experimental groups in light of the following variables: growth rates (height, weight, age, training age) and the skillful variables under study.

Table (1) illustrates this:

Table (1)

Arithmetic mean, median, standard deviation, and torsion coefficient of growth rates and training age and the skillful variables under study for the experimental and control groups N=20

variables		Measurement unit	Control group				Experimental group			
			Arithmetic mean	standard deviation	median	torsion coefficient	Arithmetic mean	standard deviation	median	torsion coefficient
Growth rate	Height	Cm	175.1	5.22	174.5	0.76	175.6	6.02	172.5	1.34
	Weight	Kg	73.5	7.89	75.5	1.92-	73.7	6.22	74	0.03-
	Age	Year	20.7	0.48	21	1.04-	20.6	0.71	20.5	0.78
	Training age	year	3.1	0.74	3	0.17-	3.2	0.63	3	0.13-
Skillful	Scrolling from running back and forward	Degree	2.5	1.08	2.5	2.89	3	1.49	3	00
		Sec	14.33	0.49	14.45	0.83-	13.75	0.51	13.6	0.61
	High jump shooting	number	2.8	0.79	3	0.41	3.8	1.32	4	0.09
	dribbling 30 meters	Sec	14.84	0.57	14.86	0.26-	13.89	0.54	13.79	0.31
	Two-way wall	number	1.2	0.42	1	1.78	1.7	0.48	2	1.04-

Tabled (T) value at degree of freedom (18) and significance level (0.05) = 1.734

It is clear from Table (1) that the values of the torsion coefficient for the research sample in each of the growth rates, training age and skillful variables under study for the control and experimental groups were limited between (+3, -3), which indicates the moderation of the distribution of players in those variables.

The equivalence of the two search groups:

The researchers found equivalence between the control and experimental groups in the light of the following variables: growth rates (age, height, weight, training age) and the skillful variables under study. Table (2) illustrates this

Table (2)

Significance of statistical differences between the control and experimental groups in each of the growth rates Training age and skillful variables under study N=20

variables		Measurement unit	Control group N=10		Experimental group N=10		Statistical significance	T) value) calculated
			M	A±	M	A±		
Growth rate	Height	Cm	175.1	5.22	175.6	6.02	0.43	Non-significance
	Weight	Kg	73.5	7.89	73.7	6.22	0.48	
	Age	Year	20.7	0.48	20.6	0.71	0.36	
	Training age	year	3.1	0.74	3.2	0.63	0.37	
Skillful	Scrolling from running back and forward	Degree	2.5	1.08	3	1.49	0.2	
		Sec	14.33	0.49	13.75	0.51	0.01	
	High jump shooting	number	2.8	0.79	3.8	1.32	0.03	
	dribbling 30 meters	Sec	14.84	0.57	13.89	0.54	0.01	
	Two-way wall	number	1.2	0.42	1.7	0.48	0.01	

Tabled value (T) at a degree of freedom was (18) and a level of significance (0.05) = 1,734

It is clear from Table (2) that there are no statistically significant differences between the control and experimental groups in each of the growth rates, training age and the skillful variables under study, which indicates that they are equal in those variables.

Data collection methods

First: References and studies related to the research

The researchers reviewed the scientific references specialized in the field of training in general (14) (18) and handball in particular (13) (15) (16), as well as previous studies related to research (2) (3) (8) (9) (20) (23) to benefit from those studies and references when preparing the training program and to determine the most important skillful variables related to the research, as well as the appropriate tests to measure those variables.

Second: Scientific devices and tools

A-Tools: Swedish stool, handballs, plastic cones, duct tape, boxes, ropes, barriers, medicine balls, collars, whistle, agility ladder, crayons, blackboard, Manizia

B- Equipment:

A rheostat for measuring height and weight

Stopwatch for measuring time (to the nearest 1/100th of a sec)

Measuring tape for measuring distance (cm

Third: The tests under consideration

A- Skillful tests

(Passing test from running (back and forward) to the right and left) to measure the accuracy of passing from sprinting, compatibility, and sprinting speed (13:122).

(High jump shooting test (10 balls) to measure the accuracy of shooting **-** from high jump (13:127, 128).

(Dribbling test for a distance of 30 meters in a zigzag line) to measure **-** dribbling speed - agility - compatibility (13:118).

(Block wall test in two directions) to measure the player's ability to repeatedly perform at the same rate for the defensive block skill in more than one defensive position (13: 142, 143).

The survey:

The exploratory study was conducted on the exploratory research sample in the period from Sunday 17/10/2021 until Sunday 24/10/2021. This study aimed to

Ensuring the validity of the tools and devices used and the appropriateness of the time of application of the tests

Finding scientific coefficients for the tests in question (veracity -). reliability

Ensure that the helping hands understand their duties and tasks.

Discover the difficulties that the researcher may encounter during the application and work to solve them.

Ensure the aspects of implementing the program's training in terms of training time and repetition times for each training, as the first three units were tested on the exploratory research sample.

Honesty:

The validity of the skillful tests in question was calculated by means of a peripheral comparison on the exploratory research sample whose number was (40) players from the research community and outside the original sample. The scores of the players were arranged in ascending order to determine the highest quartile to represent the group of high-level players in those tests whose number was number (10) players with (25%)percentage). The significance of the differences between the two groups was calculated in the skillful tests under study as shown in Table (3).

Table (3)

The significance of the differences between the averages of the two groups with a high and Low level in the proficiency tests under study N=20

variables		Measurement unit	Higher Quarters		Lower Quarters		Statistical significance	(T) value calculated
			M	A±	M	A±		
Skillful	Scrolling from running back and forward	**Degree**	**2.7**	**0.48**	**1.6**	**0.52**	**5.53**	**significance**
		Sec	**13.96**	**0.60**	**15.23**	**0.58**	**6.79**	**significance**
	High jump shooting	**number**	**3.7**	**0.82**	**2.1**	**0.32**	**9.69**	**significance**
	dribbling 30 meters	**Sec**	**12.26**	**0.85**	**13.84**	**0.57**	**0.05**	**significance**
	Two-way wall	**number**	**1.9**	**0.32**	**1**	**00**	**2.21**	**significance**

Tabled value (T) at a degree of freedom was (18) and a level of significance (0.05)=1,734

It is clear from Table (3) that there are statistically significant differences between the group with the highest quartiles, which represents the high-level players in the skillful tests under study, and the group with the lowest quartiles, which represents the low-level players in the tests under study in favor of the group with the highest quartiles, which indicates to The validity of these tests and their ability to distinguish between groups.

Persistence

The researchers applied the skillful tests under study and re-applied them with an interval of 3 days on an exploratory sample of (10) players from the research community and from outside the basic research sample and under the same conditions and finding correlation coefficients between the results of the first application and the second application to find the stability of these tests, as shown in table (4)

Tabled (4)

Correlation coefficient between the first and second applications of the skillful tests under study N=10

variables		Measurement unit	First application N=10		Second application N=10		(R) value calculated
			M	A±	M	A±	
Skillful	Scrolling from running back and forward	Degree	2.7	0.48	1.9	0.32	0.51
		Sec	13.96	0.60	14.6	0.82	0.52
	High jump shooting	number	3.7	0.82	2.7	0.68	0.42
	dribbling 30 meters	Sec	12.26	0.85	13.34	0.47	0.32
	Two-way wall	number	1.9	0.32	1.4	0.52	0.72

Tabled value (R) at a degree of freedom was (8) and a level of significance (0.05) = 0.632

It is clear from Table (4) that the correlation coefficients between the first and second applications of the skillful tests under study were limited to between (0.20 - 0.59), which are statistically significant correlation coefficients, which indicates to the stability of these tests.

Steps to carry out the search

Pre measurements

The researchers took pre measurements on the control and experimental sample of the skillful variables under study on Monday and Tuesday 25,26/10/2021

Implementation of the training content:

The plyometric exercises were applied in the proposed water medium for period of (12) weeks from Wednesday 27/10/2021 corresponding to

until 19/1/2022 by five training units on (Sunday, Monday, Tuesday, Wednesday, Thursday) of each week for the experimental group members, which implement the plyometric exercises in the proposed water medium (experimental variable) Annex (4) in the period from 12 in the afternoon until 4 in the afternoon at the swimming pool of Minya University. While the control group at the same time perform the same ideas of exercises on the ground freely and without going into the water.

Training content and time frame of the experimental program:

The researchers used one of the exercise-software specialized in sports training, which is the Exercise Pro V6 (29) program, to choose the exercises under study which number is 48, distributed as follows:

The two legs exercises and their numbers (1 to 27)-

The trunk exercises and their numbers from (28 to 33)-

Arm exercises and their numbers from (34 to 43)-

Wrist exercises and their numbers from (44 to 47)-

- Relaxation training number (48)

The researchers took into account when choosing the exercises under study that they should be graded from easy to difficult and from simple to complex, and this was taken into account when presented according to the existing sequence shown in Annex (4). The researchers also took into account, before preparing the program and legalizing its load, the general foundations and principles that are taken into account when designing training programs in general, and they also adhered to the foundations and special rules that are taken into account when using plyometric exercises within the water medium and referred to in Annex (4).

The components of pregnancy were as follows

Number of groups is (3) groups.

The number of repetitions is (20) repetitions in each group.

The time for performing one repetition is (4) seconds.

The time between sets of rest is (1) minute to complete rest.

Post measurements

The researchers took the post measurements on the experimental and control sample in the skillful variables under study on Wednesday and Thursday, January 19, 2022.

Statistical treatments used in the research

The researchers collected, tabulated and analyzed the data statistically with the extraction and interpretation of results for each of the following statistical methods: arithmetic mean, standard deviation, torsion coefficient, correlation coefficient, t-test, improvement percentage (change), Cohen d at the level of significance (0.05).

Presentation and discussion of results:

First: Presentation and discussion of the results of the first hypothesis

Table (5)

The significance of the differences between the means of the pre and post measurements of the control group in the skillful variables under study N=10

	variables	Measurement unit	Pre measurement		Post measurement		(T) value calculated	Eta 2 value	Percentage change
			M	A±	M	A±			
Skillful	Scrolling from running back and forward	Degree	2.5	1.08	4.3	0.82	4.27	0.67	72
		Sec	14.33	0.49	13.06	0.55	2.94	0.49	8.86
	High jump shooting	number	2.8	0.79	4.6	0.97	2.50	0.41	64.29
	dribbling 30 meters	Sec	14.84	0.57	14.16	0.71	4.81	0.72	4.58
	Two-way wall	number	1.2	0.42	1.9	0.32	4.27	0.67	58.33

Tabled value (T) at a degree of freedom was (9) and a level of significance (0.05) = 1.833

It is evident from Table (5) that there are statistically significant differences between the means of the pre and post measurements of the control group in the skillful variables under study and the rate of

change in favor of the post-measurement averages, as all the calculated (T) values are greater than the tabled (T) value at the significance level (0.05), The value of Eta2 for measuring the effect size ranged between (0.34: 0.85), which indicates the positiveness of the traditional program in improving the skillful variables under study among the members of the control group.

The researchers attribute this improvement to the regularity of the members of the control group in training without interruption, motivation and enthusiasm for performance and commitment to the training units. As the regularity and continuity of practice, in addition to the continuous competition between the members of the group to provide the best skillful performance had the greatest impact in raising the level of skillful abilities.

The researchers also attributed this improvement to the fact that the traditional training program prepared by the trainer contained skillful exercises that led to an improvement in the skillful level of the control group members.

As well as the efficiency of the members of the control group that used a set of various skillful exercises of a competitive nature with the performance of exercises graduated in difficulty, which led to an improvement in the level of the basic skills under study.

The researchers also attribute this improvement to the fact that the nature of performance in handball is rich in attitudes and skills through which various skillful abilities can be developed. This is confirmed by "Kamal al-Din Abdel Rahman Darwish, Emad al-Din Abbas Abu Zaid, Sami Muhammad Ali" (1998) that the player's various motor skills are reflected in the growth of basic skills traits (12: 19)

The results of this study agree with the results of the study of “Ahmed Fathi” (2020) (2), the study of “Shaima Essam (2017) (9), the study of “Doaa Osama” (2016) (7), and the study of “Wael Hussein” (2016). (25), and the study of “Marwan Ali” (2014) (22), “Wajeeh Ahmed and others” (2014) (26) that sports training programs positively affect the level of skillful performance

Thus, the first hypothesis of the research is fulfilled, which states that

There are statistically significant differences between the mean pre and post measurements of the control group in the skillful variables under study in favor of the post measurement of the control group.

Second: Presentation and discussion of the results of the second hypothesis

Table (6)

The significance of the differences between the mean of the pre and post measurements for the experimental group in the skillful variables under study N=10

variables		Measurement unit	Pre measurement		Post measurement		(T) value calculated	Eta 2 value	Percentage change
			M	A±	M	A±			
Skillful	Scrolling from running back and forward	Degree	3	1.49	6.2	0.92	5.37	0.76	106.66
		Sec	13.75	0.51	11.75	0.48	9.99	0.92	14.55
	High jump shooting	number	3.8	1.32	6.8	0.92	4.39	0.68	78.95
	dribbling 30 meters	Sec	13.89	0.54	12.51	0.55	5.92	0.80	9.94
	Two-way wall	number	1.7	0.48	3.3	0.48	2.12	0.33	94.12

Tabled value (T) at a degree of freedom was (9) and a level of significance (0.05) = 1.833

It is evident from Table (6) that there are statistically significant differences between the means of the pre and post measurements of the experimental group in all the skillful l variables under study and the rate of change in favor of the post-measurement averages, as all the calculated (T) values are greater than the tabled (T) value at the significance level (0.05). The Eta2 value for measuring the effect size ranged between (0.33: 0.92), which indicates the positiveness of the proposed program in improving the level of the skillful variables under study among the experimental group members.

The researchers attribute this improvement to the fact that plyometric exercises within the water medium have contributed to the improvement and development of the skillful variables under study; Water exercises have an effective impact on improving skillful capabilities due to the high degree of resistance it contains to the body in all its components, and this is consistent with what was indicated by "Hamid A, Abbas A. & Abbas A Hamid (2011) that water exercises throw the body in them. Great water resistance as a method of resistance to working muscles in order to strengthen the movements of the legs and arms and improve the strength (27).

In this regard, the "Al-Sukari Charity and others" (2001) mentions the preference of using plyometric exercises within the water medium over the free ground training, as it was found that the training within the water medium works on muscle coordination and balance in the development of strength for the working and non-working muscle groups in performance, as It is very important to perform the exercises in a balanced manner (6:38).

The researchers also attributed this improvement to the effect of the plyometric training program within the water medium, where the use of exercises with simple loads was taken into account, which gives the opportunity to repeat the performance for many times and with high efficiency, which showed its effect in improving the skillful variables under study, in addition to increasing the number of repetitions during performance with progress Continuous and progressive pregnancy, in addition to the diversity of the used exercises, which took into account when choosing and implementing the diversity and inclusion of the various parts of the body

These results are in agreement with the study of Abdul Rahman Ibrahim (2009) (10), the study of "Iman Farouk" (2010) (4), the study of "Mahmoud Abdel Mohsen" (2018) (20), and the study of "Reham Fadl" .((2018)(8).

Thus, the second hypothesis of the research is fulfilled, which states that

There are statistically significant differences between the mean pre and post measurements of the experimental group in the skillful

variables under study in favor of the post measurement of the experimental group.

Third: Presentation and discussion of the results of the third hypothesis

Table (7)
The significance of the differences between the means of the two post measurements for the control and experimental groups in the skillful variables under study N=20

	variables	Measurement unit	Control group N=10		Experimental group N=10		Differences average	standard deviation of differences	(T) value calculated	Cohen d	Differences in percentage change
			M	A±	M	A±					
Skillful	Scrolling from running back and forward	Degree	4.3	0.82	6.2	0.92	1.9	0.39	6.15	4.87	34.66
		Sec	13.06	0.55	11.75	0.48	1.31	0.23	9.96	5.69	5.69
	High jump shooting	number	4.6	0.97	6.8	0.92	2.2	0.42	2.90	5.24	14.66
	dribbling 30 meters	Sec	14.16	0.71	12.51	0.55	1.65	0.28	7.43	5.89	5.36
	Two-way wall	number	1.9	0.32	3.3	0.48	1.4	0.18	2.23	7.78	35.79

Tabled value (T) at a degree of freedom was (18) and a level of significance (0.05) = 1.734

It is evident from Table (7) that there are statistically significant differences between the averages of the two post measures in all the skillful variables under study and the rate of change in favor of the post averages of the experimental group, as all the calculated (T) values are greater than the tabled (T) value at the significance level (0.05). Cohen's d values for measuring the effect size ranged between (4.62: 13.68), which indicates the positivity of the proposed program in improving the level of the skillful variables under study.

The researchers attributed the higher rates of improvement of the experimental group than the control group to the process of adaptation that occurred as a result of the effect of regular training on the exercises of the program under study, in addition to the improvement in the results of the skillful tests under study in the experimental research sample compared to the control group. Continuing to carry out plyometric exercises within the water medium has an effective effect in

improving the skillful capabilities due to the high degree of resistance the body in all its components, as the body in these exercises encounters great resistance as a method for resisting the working muscles in order to strengthen the movements of the legs and arms and improve strength, as well as The nature of the implementation of plyometric exercises within the water medium which allows for more and easier movements than the ground exercises. It also increases the intensity and increase the volume and speed of movement, which is developed through the gradation in the speed of the exercises, in addition to that the plyometric exercises within the water medium work on the flow of force in the exercises Resistance, and when performing the movements of the arms and legs in a rapid pace with continuity, this helps to develop basic skills in handball.

Emad El-Din Abbas and Medhat Mahmoud (2007) explain that the organized and continuous training is the main means of developing offensive and defensive skills in handball, and that is through the applied exercises, which are the ammunition of every coach, as there is no training period without using it for a long time, whether In the training unit or throughout the sports season. Training means repetition and continuity of performance, and repetition needs an element of diversification so that stability is for long periods without boredom and falls from easy to difficult, repetition and diversity aimed at stabilizing the performance of the players and reaching the implementation with the rest of the players to the mechanism that allows proper behavior in situations Various toys. (11:57)

The results of this study agree with the study of “Asmaa Muhammad” (2003) (3), the study of “Lamia Radwan” (2010) (17), and the study of “Mahmoud Abdel Mohsen” (2018) (20).

Thus, the third hypothesis of the research is achieved, which states that

There are statistically significant differences between the mean of the two post measurements and the rate of change for the control and experimental groups in the skillful variables under study in favor of the post measurement of the experimental group.

Conclusions:

1-There are statistically significant differences between the means of the pre and post measurements of the control group in the skillful variables under study and the rate of change in favor of the post-measurement averages, as all the calculated (T) values are greater than the tabled (T) value at the significance level (0.05), and the value of (T) ranged ETA2 to measure the effect size ranged between (0.34: 0.85), which indicates the positivity of the traditional program in improving the skillful variables under study among the members of the control group.

2 There are statistically significant differences between the means of the pre and post measurements of the experimental group in all the skillful variables under study and the rate of change in favor of the means of the post-measurement, as all of the calculated (T) values are greater than the tabled (T) value at the significance level (0.05). The value of Eta2 ranged between (0.33: 0.92) to measure the effect size, which indicates the positiveness of the proposed program in improving the level of the skillful variables under study among the experimental group members

3-There are statistically significant differences between the means of the two post measurements of the control and experimental groups in all the skillful variables under study and the rate of change in favor of the averages of the post measurement of the experimental group, as all the calculated (T) values are greater than the tabled (T) value at the significance level (0.05), Cohen's d values ranged between (4.62: 13.68) to measure the effect size , which indicates the positivity of the proposed program in improving the level of the skillful variables under study

Recommendations:

1- The necessity of conducting similar studies to know the effect of "plyometric exercises within the water medium" on different samples, whether in the age group or gender, and to know their effect on the actual performance during the competition

2-The need to pay attention to activating the role of "plyometric exercises within the water medium" in the sports field generally and handball particularly, because of their effective impact on the skillful aspects.

3-Holding training courses for coaches to provide them with knowledge and information about "plyometric exercises within the water medium" with the aim of spreading the use of this method among coaches to take advantage of its advantages and improve the athletic level of players.

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Abstract into English

The effect of using plyometric water exercises on some basic skills for handball players

Research Methodology:
The researchers used the experimental method for its relevance to the nature of this research by using the experimental design of two groups, one is experimental and the other is control, by applying the pre and post measurements for both of them.

Research community:
The research community included the students of the fourth year in the Department of Team Sports and Racquet Games for the academic year 2021-2022 AD.

The research sample:
The research sample was chosen in a deliberate way from the students of the handball specialization whose number was (20) students, and they were divided into two groups, one is experimental and the other is control, with (10) students for each sample. Also they asked (40) students from other specializations for the exploratory study and calculate the scientific coefficients for the tests under study.

Conclusions:
1- There are statistically significant differences between the means of the two post measurements of the control and experimental groups in all the skillful variables under study and the rate of change in favor of the means of the post measurement of the experimental group, as all the calculated (T) values are greater than the tabled (T) value at the significance level (0.05), Cohen's d values for measuring the effect ranged between (4.62: 13.68), which indicates the positivity of the proposed program in improving the level of the skillful variables under study.

Recommendations:
1- The need to pay attention to activating the role of "plyometric exercises within the water medium" in the sports field in general and handball in particular, because of their effective impact on the skillful aspects.