Effect of special exercises using a device designed to develop the most important motor abilities and offensive skills for handball players at ages (12-14) years old

Muhannad Ahmad Jassim⁽¹⁾, Lec. Dr. Maged Hassan Ali⁽²⁾

⁽¹⁾ Master student. Faculty of Physical Education and Sports Sciences / University of Wasit, Iraq.

⁽²⁾ Faculty of Physical Education and Sports Sciences / University of Wasit, Iraq.

muhannadahmedjasim@gmail.com , majidhasan@uowasit.edu.iq

Abstract

The importance of this study is evidenced by the preparation of special exercises using a device designed for ages (12-14) years, as the researcher believes that these will have a positive effect on some of the players' better motor abilities, which is reflected in the performance of the basic offensive skills of handball being one of the critical skills the match is poignant to win and through the researchers' observation that the exercises used by some coaches for the age groups lack the use of modern educational methods and tools in handball, which may no longer be sufficient to effect the acquisition of motor abilities based on the main work of basic handball skills, as the exercises were limited to the use of traditional methods or tools prevalent in education, which does not allow diversification and change to occur, and given that working with age groups requires a period of time for the correct construction process for the stages of learning, hence the idea of research by designing a device that develops motor abilities offensive skills, the research aimed to identify the preparation of special exercises using a device designed for handball players aged 12-14 years, in addition to identifying the effect of exercises using the device designed to develop the most important movement capabilities and offensive handball skills, and the researchers assume that the exercises for using the device designed by the researchers a significant effect in developing the most important motor abilities and offensive handball skills.

As for the research methodology: The researchers used the experimental method to solve the research problem, while the research sample was chosen by a simple random method, whose number is (20) players. After excluding goalkeepers for the specificity of their exercises, in addition to excluding the players of the reconnaissance experiment, the research sample reached (12) players, and they were divided into two groups (experimental, control) equally and by (6) players in each group, as the experimental group used special exercises using the designer's device, as for the control group, they train under the supervision of the trainer and the curriculum for specialized schools for handball, and after the main experiment was applied to them, the results were analyzed and processed using (spss), and the researchers reached the results, including that the exercises using the designed device positively affected the development of the most important motor abilities and offensive skills for handball players. The researchers recommended that this type of exercise should be applied to different age groups and samples in order to develop the motor performance and skills of handball. Key words: designed device, motor abilities, offensive handball skills

Introduction:

Mobility abilities are one of the important aspects that are mainly involved in the success, improvement and development of basic skills, and this is done by developing these capabilities that are employed to increase skill learning through modern methods and means in the science of education and training through preparing exercises that give dimensions in the player's future ,we also know that the player goes through educational stages of my life related to one another, and the transition takes place between these stages according to the appropriate time periods for them, and we find that all countries of the world are working on continuous development, especially for the young age stages, the gradual development, reaching advanced age stages and achieving higher levels in all sports, the device is of great importance in teaching basic skills of movement and not stability, and this greatly helps in the process of development when moving to the stage of stability of skill, and from here the importance of this study is demonstrated by preparing special exercises using a device designed for ages (12-14) years, as the researcher believes these will have a positive effect in developing the most important and better motor abilities of the players, which will be reflected in the performance of the basic offensive skills of handball, as it is one of the critical skills in the match and influential in achieving victory.

Research problem :

And through the researchers' experience and their observation of the exercises used for age groups by some trainers of specialized handball schools, they lack the use of modern educational methods and tools in handball, which may no longer be sufficient in the events of the acquisition of motor abilities based on the main work of the basic skills of handball, as the exercises are limited to the use of traditional methods or tools prevalent in education, which does not allow diversification and change to occur. And given that working with age groups requires a period of time for the correct construction process of the stages of learning, hence the idea of research by designing a device that develops movement capabilities and offensive skills, and since handball is characterized by deception, correction, passing and receiving movements during the movement, all of this requires high-performance harmonic movement abilities.

Research objective:

- Designing a device and preparing exercises to develop the most important motor abilities and basic offensive skills for handball.
- Identify the effect of exercises using a device designed to develop the most important motor abilities and offensive handball skills.

Research hypotheses:

- Exercises for using the designed device have a significant effect on developing the most important motor abilities and offensive handball skills.

Research methodology and field procedures: Research Methodology:

The researchers used the experimental method by designing two equivalent groups, one

of them control and the other experimental with pre and post-test, due to its suitability and the nature of the research.

Community and sample research:

The research community was determined by the players of specialized schools of handball at ages (12-14) years of the province of Najaf, and they are three schools, one of which is affiliated with the Ministry of Sports and Youth, the second belongs to the Iraqi Central Handball Federation and the third belongs to the General Directorate of Education in Najaf they are (62) players. As for the research sample, it is the means through which the results are circulated to the research community, the main research sample was selected from the players of the Specialized School affiliated to the Ministry of Sports and Youth by a simple random method (lottery), whose number is (16) players, and after excluding the players of the exploratory experiment, whose number is (4), as the total number of the sample became (12) players, as they represent a percentage 19.35%) of the original community, where they were distributed into two groups (experimental, control) equally randomly by (6) players in each group, where the experimental group uses exercises especially on the designed device, while the control group uses the usual exercises from the trainer.

The homogeneity of the sample is equivalent to the two research groups:

In order to reach one equal 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 among the players, the two researchers conducted homogeneity on his research sample by taking the variables (height, weight, chronological age, training age), the results of the homogeneity of the two research groups showed that they were naturally distributed, as the values of the torsion modulus were confined to (± 1) , as shown in table (1). In order for the researcher to attribute the differences to the experimental factor, he conducted parity between the two groups of research in tests of movement abilities and the performance of offensive skills before starting to implement the exercises, so the appropriate statistical method was used, represented by the (t-test for independent samples of equal number in which the value of the significance level appeared). (Sig) greater than (0.05) and for all tests, which confirms the parity of the two research groups, and as shown in Table (2).

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Variables	Measuring unit	Mean	Std. Deviations	Skew ness	Median					
Length	Cm	168.666	5.314	0.030 -	168.5					
Mass	Kg	55.583	4.645	0.016-	56.5					
Age	Year	13.166	0.834	0.354 -	13					
Educational age	Month	5.083	1.676	0.017-	5					

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Table (2) shows the equivalence between the two research groups (experimental - control)

Variables	Measurin	Control	Experimental	Т	Sig	Sig	

	g unit	Mean	Std. Deviations	Mean	Std. Deviations	value	level	type
Coordination between eyes and arms	Number	11.333	1.751	11	1.164	0.378	0.713	Non sig
Balance	Second	3.851	0.612	3.805	0.590	0.134	0.896	Non sig
Shooting with movement	Degree	2.166	0.752	2	0.632	0.415	0.687	Non sig
Passing and receiving with movement	Second	10.630	0.881	10.530	2.060	0.109	0.915	Non sig
Deception	Degree	13.500	1.048	13.666	0.816	0.307	0.765	Non sig

Devices, tools and methods used in the research:

Research tools and used devices: The researchers used the following methods, tools and devices:

- Arab and foreign sources.
- Observation and experimentation.
- Kinetic and skill tests.
- The interview .
- International Information Network.

As for the devices used in the research: the device designed by the researchers:

- medical scale to measure weight.
- laptop (Lenovo) number (1).
- sticky marks.
- Stopwatch STOP Watch to measure time in the second.
- hand balls size (2) tape multicolored.

Field research procedures:

A device designed by the researchers:

The researchers designed a special device for developing movement capabilities and basic offensive skills within the exercises prepared by the researchers after consulting with some experts and specialists about designing a device and the possibility of using it in the sports side, especially handball, Where the device consists of several parts, including: the structure or the external shape of the device, the base of the device, the device screen, the electric motor of the device, the velocity device, the transmission beam, the optical sensors, the laser stimuli device as shown in Figure (1).



Figure (1) shows the designed device

Device work:

The player jogs on the device after the operation process and starts running over the conveyor belt for the movement, then the screen begins by transferring the stimuli in the form of a square, a circle and a triangle from the right, middle and left sides of the top of the screen at the bottom of the screen, the group of stimuli associated with the laser signals that appear from the center to the right and return to the left, the player moves according to the side on which the stimulus appears, the aim of which is the movement's response to the stimulus ,then the stimulus moves in an offensive way to the center of the device's base, it also starts from right to the center and to the left and vice versa to the end of the number of stimuli, the total of which is (6), its transmission by deceptive movements that are once a ball and the other without a ball, the aim of which is to develop deception, harmony and balance, and this is within the exercises specified by the researchers.

Determine the most important motor abilities and offensive skills and their tests:

For the purpose of determining the most important motor abilities, basic offensive skills at ages (12-14) years with hand reel and tests so that they are appropriate for the research sample, after reviewing the scientific sources and previous studies, the two researchers organized a questionnaire form and it was presented to a group of experts in the field of sports training science and handball, to take their opinions in determining the most important motor abilities, basic offensive skills, and special tests for them, after emptying the questionnaires and extracting the percentage, the most important motor abilities were nominated, the basic offensive skills that scored (75%) or more. "The researcher has the right to choose the percentage he deems appropriate when choosing indicators" (Allawi and Radwan: 2000) ⁽¹⁾, where all the following were identified:

First: motor abilities:

- Coordination between eyes and arms.
- Balance.

Second: basic offensive skills:

- Shooting with movement.

- Deception.
- Passing and receiving with movement.

As for the tests that the researchers obtained, they were all of the following:

- Coordination: Measuring the compatibility between the eye and the arm: ⁽²⁾
- Balance: measuring balance, standing on the comb: ⁽³⁾
- Correction: Measuring the accuracy of aiming with movement: ⁽⁴⁾
- Deception: a measure of the skillful performance of deception: ⁽⁵⁾
- Passing and Receiving: Measuring Handling and Receiving by Movement: ⁽⁶⁾

Exploratory Experience:

The researchers conducted two exploratory experiments for the tests used and some exercises prepared on the equipment designed by the researchers for two days, Sunday and Monday corresponding to 7-8/2/2021, on a sample of (4) players representing the players of the specialized training center affiliated to the Central Iraqi Federation, who did not participate in the main experience on the hall of the Kufa Sports Club, and that the aim of the exploratory experience of the tests is the following: -

- Ensure the suitability of the field and the tools used and their suitability for the tests.
- Preparing the assistant work team, Appendix (2), as well as identifying the difficulties that they may face and knowing the sample's readiness to perform the tests.
- Knowing the field difficulties that the researchers may face during the application of the exercises.
- Ensuring the validity of the equipment and tools used and preparing them in the training unit.
- Knowing the necessary times for each exercise and the number of repetitions.
- Finding the scientific basis for the tests, as shown in Table (3).
- The sample's understanding of the exercises and the ability to apply them.

Table (3) shows the name of the test, the stability factor values, and the objectivity parameter for the physical and functional tests:

Ν	Test	Reliability coefficient	Objectivity
1	Coordination	0.86	0.96
2	Balance	0.90	0.98
3	Shooting	0.87	0.97
4	Deception	0.88	0.95
5	Passing and receiving with movement	0.91	0.97

Main experiment procedures:

The researchers conducted the pre-tests for the two groups in the closed hall of the Kufa Sports Club on 2/11/2021, after which the exercises were carried out on the device designed for the experimental group on 2/13 until 4/4/2021, as it consisted of (24) training units, three units per week (Saturday - Monday - Wednesday) for a period of (8) weeks. After completing the exercises, the two researchers conducted the post tests on 4/9/2012, for the purpose of obtaining and discussing the statistical results. The researchers were also keen to restore the temporal and spatial conditions and the same devices in order to reach the best results.

Presentation, analysis and discussion of results:

Presentation and discussion of the results of the pre and post-tests of the control and

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experimental groups of the variables under study:

Presentation of the results of the pre and post-tests of the motor abilities and offensive skills of the experimental group:

Table (4) shows the arithmetic mean, standard deviations, the calculated (T) value of the correlated samples, the level of significance of the test Sig, and the significance of the difference for the pre and post-tests of the experimental group in the research variables:

		Pre-test		Post	-test			
Variables	Measurin g unit	Mean	Std. Deviations	Mean	Std. Deviations	T value	Sig level	Sig type
Coordination	Number	11.333	1.751	14.166	2.136	2.629	0.047	Sig
Balance	Second	3.851	0.612	5.175	0.922	3.890	0.012	Sig
Shooting with movement	Degree	2.166	0.752	3.166	0.752	2.739	0.041	Sig
Deception	Degree	13.500	1.048	16.166	0.983	6.325	0.001	Sig
Passing and receiving with movement	Second	10.630	0.881	8.640	0.670	4.577	0.006	Sig

Presenting the results of the pre and post-tests of the motor abilities and offensive skills of the control group.

Table (5) shows the mean, standard deviations, the value (T) calculated for the correlated samples, the level of significance of the test Sig, and the significance of the difference for the pre and post-tests of the control group in the research variables:

		Pre-test		Post-test				
Variables	Measurin g unit	Mean	Std. Deviations	Mean	Std. Deviations	T value	Sig level	Sig type
Coordination	Number	11	1.264	11.833	0.983	5	0.004	Sig
Balance	Second	3.805	0.590	4.026	0.504	4.396	0.007	Sig
Shooting with movement	Degree	2	0.632	3	0.632	3.873	0.012	Sig
Deception	Degree	13.666	0.816	14.333	0.516	2	0.102	Non Sig
Passing and receiving with movement	Second	10.530	2.060	9.730	0.962	1.334	0.240	Non Sig

Discussing the results of the pre and post tests for the two research groups (control and experimental) for the most important motor abilities and offensive skills with handball.

It is clear through tables (4,5) that show that the results of the pre and post-tests of the control and experimental groups for the researched variables, as it turns out that there are

significant differences between the pre and post tests and in favor of the post tests of the experimental group (compatibility, balance, correction, deception, handling and receiving) while the control group showed significant differences in some variables, and no differences appeared in the skill of deception and handling in the post-tests.

Regarding the control group: the researchers attribute the variables in which the differences appeared, due to the nature of the exercises prepared by the trainer and despite the experimental group being subjected to special exercises on the device prepared by the researchers, this does not negate the development of the control group, and the researchers also attribute this development to the use of regular exercises in the correct manner set by the trainer, in addition to the regularity of the players in training and continuing without interruption during the period of the researcher's application of his experience, it had a clear role in developing the most important movement capabilities and basic offensive skills in handball, which led to a slight development compared to the results of the experimental group, as Saad Mohsen confirms: The sources of their scientific and practical culture differed. The training approach inevitably leads to the development of achievement, if it is built on a scientific basis in organizing the training process, programming it, noting individual differences, using optimal repetitions and effective interval periods, under the supervision of specialized trainers, under good training conditions in terms of place, time and tools used ⁽⁷⁾.

It is also clear from the above table that the members of the control group have not achieved a real development in the level of deception and handling skill, the researchers attribute that the use of usual exercises lacked coordination between developing motor abilities and linking them to skill performance. The manner of speaking in the training units stipulates that they are distinguished by composition, diversification and continuous change throughout the period of their application in exercises. As exercises should increase the desire and excitement of the players in order to connect the player to mastering the skill perfectly, what (Qasim Lazam) asserted, "The player who has a level of movement and physical abilities will help to develop basic skills" ⁽⁸⁾.

As for the experimental group: it is clear that the development results are consistent with what the researchers expected in their hypotheses, as the significant differences between the pre and post-test became clear and in favor of the post test of the experimental group in all the most important motor abilities and basic offensive handball skills. The researchers attribute that this superiority is due to the effectiveness of the special exercises to the device used by the researchers, which was prepared and applied according to the special scientific foundations in line with the members of the experimental research sample, which included exercises on biomotor abilities and their twinning with the basic offensive skills of handball.

In addition to the effectiveness of the exercises selected scientifically with the level of the players, so that they were arranged and coordinated within the training units and applied in a scientific and thoughtful manner according to the regular sequence, the number of repetitions, periods of rest, and the variety between exercises, so that the repetitions lead to the development of the main muscle groups that contribute to performance, and Kamal Darwish states that

"diversity in exercise renews the activity of play and motivation for the continuity of performance as well as gives him opportunities to confront the changing playing situations that occur in competition", " And that the process of players mastering the skills through performing the exercises and repeating them in a positive manner and the commitment of the players in implementing the vocabulary of the curriculum also contributed to the development of these skills and their mastery compared to their performance with their performance in the post-tests, and this is consistent with what came" that re-training several times enables the player to master Skill and do better" ⁽⁹⁾. This view is consistent with what Abd Ali Nassif stated, when he stated that "the scheduled exercise has a great impact on the development of performance" ⁽¹⁰⁾.

In addition to the use of modern means and equipment, which allows the field to gain motivation and excitement for skills, and this is what Ahmed Amin Fawzi indicated, "The diversity in tools and their exercises all of this will stimulate the players and increase their motivation towards progress and raising the level of sports" ⁽¹¹⁾.

Presenting the results of the significant differences for the post-tests of the control and experimental groups of the research variables and discussing them:

Presenting the significant results of the differences between the control and experimental groups for the dimensional tests of kinetic abilities and offensive handball skills.

Table (6) the mean, standard deviations, the value of (T) calculated for independent samples, the level of significance of the (Sig) test, and the significance of the differences between the results of the post-tests of the control and experimental groups for movement abilities and offensive handball skills.

		Control		Experimental				
Variables	Measurin g unit	Mean	Std. Deviations	Mean	Std. Deviations	T value	Sig level	Sig type
Coordination	Number	14.166	2.136	11.833	0.983	2.430	0.035	Sig
Balance	Second	5.175	0.922	4.026	0.504	2.677	0.023	Sig
Shooting with movement	Degree	3.166	0.752	3	0.632	2.415	0.047	Sig
Deception	Degree	16.166	0.983	14.333	0.516	4.044	0.002	Sig
Passing and receiving with movement	Second	8.640	0.670	9.730	0.962	2.277	0.046	Sig

Discussion of the significance of the differences between the control and experimental groups for the post tests of motor abilities and offensive skills with handball:

In our observation of Table (6), which shows the arithmetic mean of the dimensional results of the motor abilities and offensive skills and the value of (T) calculated for the independent samples of the two groups (control and experimental), we find that there are significant differences between the two tests in favor of the first experimental group. The researchers attribute the reason for this superiority to the members of the experimental group that relied in their exercises on the use of the designed device at the expense of the control group that

was trained by traditional means, the reason for the emergence of the moral differences is due to the modern use of the designed training apparatus related to the game, and this is what gives the players pleasure and excitement, which was reflected in the improvement of their motor capabilities and skills when carrying out their training duties, which in turn is reflected in the level of the post-test results, as players should have a high potential when training according to what the handball game needs.

Moreover, the superiority of the experimental group over the control group is the way in which the exercises were built according to the use of the proposed device within the training unit for the players, with the multiplicity of forms of using these exercises in different and varied situations, as well as giving appropriate and programmed repetitions accurately commensurate with the capabilities of the player at this stage, in addition to that the continuous directions by the trainer to correct the error of the motor performance of the skill using the feedback to the learner as well as urging and encouraging them throughout the preparation of the exercises as it worked on the high level of accuracy of the performance of compatibility and balance in addition to shooting, deception and passing, this is proven by the value of the moral differences that the researchers reached compared to the value of the differences for the control group, and here we note that the tools and auxiliary means were the positive role in raising the level of accuracy in performance, especially through the proposed device, this is confirmed by Ali Muhammad Abd Al-Razzaq Al-Khayyat, "The use of various educational methods in the training and educational process makes the learning process more effective and positive" ⁽¹²⁾.

The researchers also attribute that the increase in the dimensional tests in motor abilities (compatibility and balance) can be attributed by the researchers to the organization of the training process in the application of exercises on the designed device, which gives a great impact on developing the level of performance according to the capabilities of the players, this results from a good preparation of the exercises used, as well as the use of appropriate devices and tools, which leads to the emergence of positive results at the skill level, and that "the level that the player reaches in terms of performance and achievement can only be achieved through organizing the training program used" ⁽¹³⁾.

The researchers attribute the reason for the superiority of the experimental group over the control group in the development of basic offensive skills with handball, this is to use as exercises on the device designed by the researchers, which is one of the modern educational and training techniques and methods that help in developing the motor pathway for special skills, as it helps to stimulate the largest number of motor units, when the performance is at full speed from the beginning of the movement to the end, and its importance appears as resistance during the performance in that it is a means similar to the kinetic performance of the skill, as it helps in the reactionary movement to complete the skillful performance.⁽¹⁴⁾

Conclusions and recommendations:

Conclusions:

- The exercises for the use of the designed device positively affected the development of movement capabilities and offensive handball skills.

- The development of the motor abilities reflected positively on the development of the skill of correction, deception and handling with hand reel among the subjects of the research sample.
- The experimental group players outperformed the control group in terms of movement abilities and offensive handball skills.

Recommendations:

- The necessity of using training devices and means due to their importance in reducing effort and time.
- Emphasis on handball coaches that the training sessions using modern equipment should be an approximation of the actual working times in the match and similar to the performance inside the playing field.
- Conducting similar scientific research by using other methods and devices on other samples such as juniors, youth and advanced students.

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Appendix (1)

Sample (TRX) Exercises

First exercise: deception by changing the speed of a run:

The player changes his speed from slow to faster through the stimuli that appear to him and also according to the speed that will be determined in the experience and the purpose is to build an idea while learning the skill, which is passing the defender and receiving a ball. **Second exercise**: Passing and receiving exercises:

The player receives the ball from the movement above the base of the ready-made suggested by the colleague from the left or right corner of the device and at the level of the chest, and then passes it to the same teammate, and the focus must be on the pass point in order to complete the pass and receive process successfully.

Third exercise: passing and receiving from the side:

The reception is by the proposed ready and during the movement from the fellow road and then receiving the ball sideways taking into account the forward movement of the player and then passing to the teammate sideways as well.

Fourth Exercise: shooting exercises from running:

The player receives a ball from the teammate while running over the base of the proposed device, and then shoots the highest m after the exciting appearance of him from the ready screen.

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Exercise	Intensity	time	rapatitions	Between	Between	exercises
number	-		repetitions	repetitions	exercises	time
1	10 km/h	12 second	5	1 min	2.30 min	7.20 min
2	15 km/h	10 second	4	1.30 min	3 min	8.10 min
3	10 km/h	15 second	6	1 min	2 min	8.30 min
4	15 km/h	10 second	5	1 min	2.30 min	7.20 min

Appendix (2) Sample from the training unit