

The effect of using the "Battle rope" training on some physical variables of handball players

***Pro. Dr. Marwan Ali Abdelallah**

Professor of Sports Training "Handball" Department of Team Sports and Racquet Games, Faculty of Physical Education, Minia University .

****Pro. Dr. Nagwa Mahmoud Ayed**

Professor of Sports Training "Handball" Department of Team Sports and Racquet Games, Faculty of Physical Education, Minia University .

***** Assi.Lect. Shaimaa Esam Shaker**

Assi.Lect. Assistant lecturer at Department of Team Sports and Racquet Games, Faculty of Physical Education, Minia University .

Introduction & research problem:

Scientific progress has become the feature that distinguishes the current era, as it contributes to finding many scientific solutions to many problems in all areas of life in general, and the field of physical and sports education in particular. We learn about the tremendous progress and rapid rise in the level of performance of players for various sports activities

Mounir Gerges Ibrahim (2004) adds that training in motor skills is one of the most important pillars of the training process, which aims to develop or maintain the level, as each game has its own skill exercises that the coach uses with the aim of developing or maintaining the level. Skillful abilities that help him integrate physical performance, skills and planning together in a good form through which he can implement offensive and defensive plans with high efficiency (8: 73-93)

Abdul Aziz Al-Nimr, Nariman Al-Khatib (2000 AD) explains that physical preparation in the sporty advanced countries has become on the top of other aspects of preparation, such as technical and tactical preparation, where the elements of physical fitness must be developed first and to an appropriate degree, because technical goals are formulated for individuals and various sports activities according to abilities Physical fitness of the players (6:7).

The physical ability factor helps the handball player to move to perform offensive and defensive movements on the field. It is an important factor in confusing the opponent, making him unable to think or anticipate the movement

of the attacking players and surprising the opponent by performing quick offensive movements characterized by accuracy and good timing, which leads to success in highlighting Objectives.

Antony Bobu, and A. Palanisamy (2017) point out that John Brookfield devised a training system using Battle rope as a high intensity training tool for developing anaerobic and aerobic endurance; And it has different shapes and types; Its length usually ranges from 26-50 feet, and its thickness ranges between 1 to 2 inches. It is wrapped with a thick tape that is safe to hold. (16:709).

Nadia Sultan (2001) mentions that the successful performance of different skills requires some physical abilities depending on the type of sports activity, and these abilities perform their functions in a coherent manner, which results in reaching the correct motor performance, whether this movement is simple or complex (14:41)

Marín, P. J., et al (2015) and Jason et al Verdisco (2015) agree that Battle rope is used to develop physical fitness as it has the same effect as running, but more clearly on the upper half of the body; It contributes to a large percentage in improving cardiovascular fitness for strength, grip strength, muscular endurance and fat loss for the athlete (17: 240) (18: 766).

Also, "Issam El-Din Abdel-Khaleq" (2003) indicates that raising the level of physical performance helps to raise the skillful level through training, which is a process of repetiting the performance of motor skills in different conditions to reach the players to the stage of competition; Each of the games and the level of mastery it reaches depends on its practice of its basic skills. (5:66).

Also, special exercises using resistance tools such as the Battel rope tool, help to significantly develop and improve athletic performance and achievement and to improve and develop the athlete's offensive skills in his specialized sport, and use the athlete's body weight as an important resistance to develop the ability to jump and jump during performance exercises to develop rebound strength For the two men.(22).

The researchers noticed the weak physical level of the players, the lack of interest in using modern methods and tools in training that work to develop the level of physical performance and skills of handball players, and this is what prompted the researchers to use advanced training methods to solve this problem

using the Battel rope tool to develop some physical abilities for handball players.

Research objective:

The research aims to identify:

The effect of the Battel rope training on some physical abilities under research (muscular ability, balance, compatibility, and motor speed) on handball players.

Research hypotheses

1-There are significant differences between the mean of the pre and post measurements and the percentage of improvement for the experimental group in the physical variables under study.

2-There are significant differences between the mean of the pre and post measurements and the percentage of improvement for the control group in the physical variables under study.

3-There are significant differences between the mean of the two post measurements and the percentage of improvement for the experimental and control groups in the physical variables under study.

Research importance

Provide a variety of exercises using the Battel rope tool to improve the speed of physical performance to keep pace with the developments in the field of sports training in general and handball in particular.

Terms included in the search

Battle rope tool

It is a training tool used for the purpose of lifting physical fitness, and the length of one usually ranges from 26-50 feet, and its thickness ranges between 1 to 2 inches, and the intensity varies according to its length and thickness. There are three common moves when using it (ripple, whip, and crash) using the Battle rope. (4)

Previous studies:

1-The study "Ratamess et al., n. A. et al" (2015 AD) (19) The study aimed to measure and compare acute metabolic responses after exercising resistance training that includes exercises with free weights resistance and by comparing body weight with the Battle Rope resistance. The study used the experimental method and the number of the research sample was (10) ten athletes whose ages ranged between(18-20) years and used resistance exercises for each of the three types (free movement - body weight and (Battle Rope) on separate days. These data indicate that the performance of resistance exercises using Battle Rope Raises higher metabolic demands than traditional resistance exercise.

2-The study of "Hamdi El-Sayed Abdel-Hamid" (2018) (4) The study aimed to identify the effect of Battle Rope training on the respiratory efficiency and the digital level of the 1,500 runners. The research sample included students of the Faculty of Physical Education, Damietta University, who are registered in the Damietta Athletics region. The program implementation period took (8) weeks, with three training units per week, the unit duration is (45) minutes. The results of the study showed that there is an improvement in the level of the respiratory system, the vital capacity of the inhale, expiratory capacity, expiratory volume, exhaled air rate.

3- Study of "C.Kaba Rosario, K.M.Prakash Raaj" (2017)(20) entitled "The effect of Battel rope training on selected fitness components and skillful variables for volleyball players." The research aims to identify the effect of Battel rope training on selected fitness components and variables. The skill of volleyball players, the researcher used the experimental approach with an experimental design for two groups, one is control and the other is experimental. The research sample included a sample of (22) volleyball players from different colleges in Tamil Nadu, India, and the most important results were the presence of statistically significant differences between the experimental and control groups and in favor of the experimental group in the physical variables (strength, arm strength, endurance) and the skillful performance.

Research plan and procedure:**Research Methodology:**

The researchers used the experimental method due to its suitability to the nature and objectives of the research. The researchers used one of the experimental designs, which is the experimental design for two groups, one is experimental and the other is control, by applying the pre and post measurements for both groups.

Research community and sample :

The research sample was chosen in a deliberate way from the players of the handball team at the Faculty of Physical Education, Minia University for the academic year 2021-2022 AD, whose number was (40) students who are the members of the research sample. They were divided into two equal groups of (20) players for each one, one is experimental and the other is control . Where the experimental group used various exercises using the Battel rope exercises, and the control group used the program developed by the trainer.

Data collection methods**First - References and studies related to the research:**

The researchers looked at the scientific references specialized in the field of training in general and handball in particular, as well as the previous studies related to the research to benefit from those studies and references when using the (Battel rope) exercises and to identify the most important physical variables associated with the research as well as the appropriate tests to measure those variables. (12)(9)(10)(11)

Second - devices and tools

A- Tools: Swedish stool, handballs, graduated ruler 50 cm long, colored plastic cones, adhesive tape, boxes, ropes, barriers, medical balls (of different weights), hoops, colored cards, whistle, Battel rope tool, chalk Wood chair, signs.

B - Devices: a rheostat for measuring height and weight, a stopwatch for measuring time (to the nearest 1/100th of a second), a tape measure for measuring distance (cm), a crystal clock to measure the pulse.

Third - the tests used in the research

The researchers conducted a survey of scientific references, research and previous studies in the field of handball, such as “Marwan Ali Abdullah” (2003) (9), “Hamdi Al-Sayed Al-Nawasri” (2018) (4), “Kamal Al-Din Abdel-Rahman Darwish, Kadri Sayed Morsi, Emad Al-Din Abbas” (2002) (7) to arrive at the used tests of the physical variables, and the following tests were selected:

.Tests of the physical variables in question

The first test: (a test of throwing a weight of 900 g from the shoulder level) to measure the muscular ability of the arms (10: 111)

The second test: (Vertical jump test from stability) to measure the muscular ability of the legs. (10:120)

The third test: (Kinetic balance test with the knowledge of BAS) to measure balance. (10:99)

The fourth test: (the pass-and-receive test on the front wall 10 times) to measure the motor speed. (10:100)

The fifth test: (the numbered circles test) to measure the compatibility of the legs and eyes. (10:133)

The sixth test: (the long jump test of stability) to measure the muscular ability of the legs. (10:130)

Measurements of growth rates

The researchers made sure of the moderation of the distribution of the members of the basic and exploratory research sample in the light of the following variables: (growth rates (age, height, weight, physical variables) under study. Table (1) illustrates this:

Table(1) : description of the research sample .

N=20	control group(N =10)			trail groub(N =10)		
	Age(years)	Hight(cm)	Weight(kg)	Age(years)	Hight(cm)	Weight(kg)
Mean	22.7	175.9	70.5	22.6	174.2	69
Median	22.4	176.5	72.5	23	176.5	67.5
SD	0.37	7.7	9.2	0.53	8.3	10.7
Skewness	-1.47	-0.29	-0.57	1.3	-0.11	0.07

TESTS**STATISTICS:**

It used Mean, Median , SD , Skewness , t.test , change ratio.

RESULTS :

There are statistically significant differences in defensive skillful variables under investigation and in the direction of post test.

The survey:

The researchers implemented and conducted the exploratory study on a sample of (10) players from the same research community and outside the basic sample from January 20, 2022 until January 23, 2022 AD, in order to conduct scientific transactions to ensure the validity of the tools and the appropriateness of the physical tests under study.

pre measurements:

For each of the experimental and control groups, the researchers carried out a tribal measurement on the research sample from February 20, 2022 AD to February 21, 2022 AD in the variables under study. The researchers took into account the application of these measurements to all members of the research sample in a unified manner.

Program application:

The proposed program was applied to the experimental group from 27/2/2022 to 22/5/2022 for a period of twelve weeks with 5 training units per week, regarding that the experimental group uses the Battel rope exercises, and the control group doesn't use these exercises.

post measurements:

The researchers made the post measurement of the research sample in the physical variables under study in the period from 05/23/2022AD until 5/24/2022AD for both the experimental and control groups.

The used statistical method:

To calculate the results of the research, the researchers used the following statistical methods

Arithmetic mean / median / standard deviation / skew coefficient / correlation coefficient / whitney test - The man labarometric / improvement rate/

The researchers satisfied the significance level at the level (0.05), and the researchers used the spss program to calculate some statistical transactions.

Discuss & interpret the results:

First, review the results:

The researchers will display the results related to the research in the following order:

The first hypothesis: The first hypothesis states that

"There are significant differences between the mean of the pre and post measurements and the percentage of improvement for the experimental group in the physical variables under study"

Table(2)

There is a significant difference between the mean of the pre and post measurements and the percentage of improvement for the **experimental** group in the physical variables under study

Test	N=10	Test objective	Pre test		Post test		t.test	Change ratio
			mean	SD	Mean	SD		
Throwing a weight of 900 g from shoulder level		Power in arm (meter)	9	1.85	13.5	1.2	1.9	50
Long jump of stability		Power in leg (meter)	2.45	1.6	2.8	1.3	2.1	14.3
Vertical jump from stability		Power in legs(cm)	45	.45	58	.65	1.9	28.8
dynamic Balance by Bass		Balance (sec)	65	4.5	46	.42	2.3	29.3
Pass-and-receive test on the front wall 10 times		Repetitive motion speed (sec)	12	4.2	5	.56	2	58.3
digital circuit		Coordination (sec)	6.8	3.2	5.4	1.2	1.9	20.6

The second hypothesis: The second hypothesis states that

"There are significant differences between the mean of the pre and post measurements and the percentage of improvement for the control group in the physical variables under study"

Table(3)

There is a significant difference between the mean of the pre and post measurements and the percentage of improvement for the **control** group in the physical variables under study

test	N=10	Test objective	Pre test		Post test		t.test	Change ratio
			mean	SD	mean	SD		
Throwing a weight of 900 g from shoulder level		Power in arm (meter)	7.2	2.2	10	.9	1.86	38.8
Long jump of stability		Power in leg (meter)	2.20	2.6	2.45	2.45	2.4	11.4
Vertical jump from stability		Power in legs(cm)	40	.3	65	.45	2	62.5
dynamic Balance by Bass		Balance (sec)	55	3.4	50	6.5	4.3	9.1
Pass-and-receive test on the front wall 10 times		Repetitive motion speed (sec)	10	2.3	8.2	.12	2.6	18
digital circuit		Coordination (sec)	6.9	.42	4.8	6.8	1.89	30.4

The third hypothesis: The third hypothesis states that

"There are significant differences between the mean of the two post measurements and the percentage of improvement for the two experimental and control groups in the physical variables under study"

Table(4)

There are significant differences between the mean of the two post tests and the percentage of improvement for the experimental and control groups in the physical variables under study

Test	Test objective	control group		experimental group		t.test	Change ratio
		mean	SD	Mean	SD		
Throwing a weight of 900 g from shoulder level	Power in arm (meter)	10	.9	13.5	1.2	4.2	35
Long jump of stability	Power in leg (meter)	2.45	2.45	2.8	1.3	2.4	14.3
Vertical jump from stability	Power in legs(cm)	65	.45	58	.65	3.5	10.7
dynamic Balance by Bass	Balance (sec)	50	6.5	46	.42	1.9	8
Pass-and-receive test on the front wall 10 times	Repetitive motion speed (sec)	8.2	.12	5	.56	3.1	39.1
digital circuit	Coordination (sec)	4.8	6.8	5.4	1.2	2.4	12.5

Second: Interpretation & discussion of the results:

It is clear from Table No. (3) that there are significant differences between the mean of the two measurements, the pre and post measurements, and the percentage of improvement for the control group in the physical variables under study.

The researchers attribute this improvement to the fact that the training program contained a new and advanced set of Battel rope exercises, and these exercises showed an improvement in the level of some physical variables (muscular ability, coordination, balance, kinetic speed) on handball players

This agrees that the Battel rope exercises work to develop physical abilities such as muscular ability, coordination, balance, and motor speed, which are effective and influential elements in the development of the physical level of handball players (4)(3)(13).

Kramer et al., k (2015) indicate that the Battle rope training is a modern training method that has gained popularity recently as a method used by a wide range of amateur and professional players to develop the fitness and physiological variables (21:32).

Abu El-Ala Ahmed Abdel-Fattah and Hazem Hussein Salem (2011) mention that weight training is one of the effective training methods, which aims to provide the individual with different physical and motor abilities so, most athletes use it in the preparation period for various sports activities and includes organized exercises for different muscle groups using different weights. (2:76).

These results are in agreement with what was indicated by Ismail Hamed and others (2005 AD) (1), which indicated that training with weights led to the superiority of the post measurement over the pre one of physical abilities tests.

Thus, the validity of the second hypothesis that says “there are significant differences between the mean of the pre and post measurements and the percentage of improvement for the control group in the physical variables under study is achieved

As shown in Table No. (2), there are significant differences between the mean of the two measurements, the pre and post measurements, and the percentage of improvement for the experimental group in the physical variables under study.

The researchers also attributed the high results of the experimental group in physical tests in the post-measurement to the high level of physical abilities gained from the application of the training program using (Battle Rope), and this is consistent with what was indicated by the study of Yahya Al-Hawi (1997 AD) that the training program with weights directed to develop the effectiveness of skillful performance had a

significant effect on the post measurements of the maximum static and kinetic force tests with weights. (15 : 108).

This is consistent with what was indicated by Ismail Hamed (2005 AD), which indicated that weight training programs directed towards the development of strength characterized by speed, compatibility and balance have achieved significant superiority over other training programs during the post-measurement of physical abilities tests under discussion. (1:57).

In the end, it is clear that the Battel rope exercises followed by the experimental group had a positive effect in developing the physical abilities under consideration for handball players.

Thus, the validity of the first hypothesis that says "there are significant differences between the mean of the two measurements before and after and the percentage of improvement for the experimental group in the physical variables under study" is achieved.

As shown in Table (4), "there are significant differences between the averages of the two post measurements and the percentage of improvement for the experimental and control groups in the physical variables under study.

The researchers attribute this result to the use of Battle Rope training, which is applied to the players of the experimental research group.

The researchers attribute this improvement to the fact that the training program, which contained a set of different Battel rope exercises, and kinetic speed exercises during the performance of movements, as well as the development of motor coordination of the eyes, legs and hands, because the player's movement is according to the movement of the tool that is meters away from the player, which are factors affecting in Scrolling and shooting

The researchers attributed the superiority of the experimental group over the control group in these tests to the effect of the training program using (Battle Rope), during which the load was directed towards the development of muscular ability, kinetic speed, coordination and balance, during which the principles of different exercises with the (Battle Rope) tool were followed.(22).

The researchers believe that as a result of the overlapping effects of training, we find that with the increase in the maximum strength gained from the (Battle Rope) training program, it was followed by an superiority in the physical abilities tests of the experimental group than the control group

Thus, the validity of the third hypothesis that says "there are significant differences between the averages of the two post measurements and the percentage of improvement for the experimental and control groups in the physical variables under study" is achieved.

Conclusions and recommendations

The conclusions

In light of the research objectives, hypotheses, and statistical treatments used by the researchers, and based on what the research results showed, the researchers reached the following conclusions:

- 1-The proposed training program using (Battle Rope) exercises led to an improvement in the level of some physical variables for handball players.
- 2-The use of Battle Rope exercises had a better positive effect than the traditional program in improving the level of some physical variables among handball players.

Recommendations:

Within the limits of the research community and the selected sample, and in light of the research objectives and hypotheses, and through the results, the researchers recommend the following:

- 1-Applying Battle Rope exercises when developing training programs for handball players because of their positive impact on developing the level of physical attributes.
- 2-The necessity of using Battle Rope exercises when developing training programs in general because of their positive effects on developing the level of physical attributes.
- 3-Using the Battle Rope training program in different age groups.

References:

1-Ismail Hamed Othman, Mohamed Abdel Aziz Ghoneim, Dia Al-Din Mohamed Al-Azab, Atef Maghawry Shaalan (2005): Boxing: education, management and training, 3rd edition, Cairo.

2-Abu El-Ala Ahmed Abdel-Fattah, Hazem Hussein Salem (2011): Contemporary trends in swimming training, Arab Thought House, First Edition, Cairo.

3-Ehab Abdel Rahman Ibrahim: The effect of (Battel rope, Trx) exercises on developing some special physical abilities and the performance level of punch groups for adult boxers, research published in the Journal of Physical Education Research, Volume 71, Number 139, Faculty of Physical Education for Boys, Zagazig University, 2022 AD.

4-Hamdi El-Sayed Abdel-Hamid (2018): The effect of Battle Rope training on the respiratory efficiency and the digital level of 1500 runners, published scientific research, Assiut Journal of Science and Sports Arts, Assiut University.

5-Essam El-Din Abdel-Khalek Moustafa (2003): Sports training (theories - applications), Mansha'at al-Maaref, Alexandria, 11th edition.

6-Abdulaziz Al-Nimr, Nariman Al-Khatib (2000): Physical preparation and training with weights for pre-pubertal juniors, The Masters for Sports Book, Cairo.

7-Kamal Abdel-Rahman Darwish, Qadri Sayed Morsi, Imad El-Din Abbas Abu Zeid (2002), Measurement, Evaluation and Match Analysis in Handball (theories, applications), Cairo, Al-Kitab Center for Publishing.

8-Mounir Gerges (2004): Handball for all, "Comprehensive training and skilfull excellence", distinguished and revised edition, Cairo, Arab Thought House.

9-Marwan Ali Abdullah (2003): "The effect of weight training and plyometrics on some physical, skillful and physiological variables for handball players." Unpublished Ph.D. thesis, Faculty of Physical Education, Minia University

10-Muhammad Sobhi Hassanein: Measurement and Evaluation in Physical Education, 6th Edition, Cairo, Arab Thought House, 2004.

11-Muhammad Sobhi Hassanein (1997): Measurement and Evaluation in Physical and Sports Education, 3rd Edition, Cairo, Arab Thought House.

12-Mustafa Ahmed Abdel Rahman (2015): "The effect of a simultaneous training program on some physical and skillful variables for handball players." Unpublished Master's Thesis, Faculty of Physical Education, Minia University.

13-Mohab Mohamed Reda Mousa: The effect of functional strength training on the development of some physical attributes and the level of performance of the forehand and backhand straight kick for squash players, research published in Assiut Journal of Physical Education Sciences and Arts, No. 42, Faculty of Physical Education, Assiut University, 2021.

14-Nadia Muhammad Sultan (2001): Modern trends in sports training, Faculty of Physical Education for Boys, Alexandria University.

15-Yahia al-Sayyid Ismail al-Hawi (1997): Boxing, the foundations of theory and practical applications, Arab Publishing Center, Zagazig.

17-Marín, P. J., García-Gutiérrez, M. T., Da Silva-Grigoletto, M. E., & Hazell, T. J. :The addition of synchronous whole-body vibration to battling rope exercise increases skeletal muscle activity. Journal of musculoskeletal & neuronal interactions, 15(3), 240,2015.

18-Verdisco, Jason, John Petrizzo, Joanna Venezia, Jonathan Lester, John The Energy Cost of Battle :Donnelly, John Wygand, and Robert M. Otto Rope Exercise." Medicine & Science in Sports & Exercise 47, no. 5S: 766 , 2015 .

19- ,B.m, smith,c.R& 19- Ratamess,n.A, Rosenberg j, G,Klei,s, Dougherty faigenbaum A.D: comparison of the acute metabolic Responses to traditional resistance,bodyWeight and battling rope exercises,the journal of strength & conditioning Research,29 (1),47-57,2015

20- K.M.prakash Raaj, c. kaba Rosario 2017: Impact of battle rope training on selected physical fitness components and performance variables among volleyball players , indian Journal of Rrsearch , volume :6/Issue :4/April

21- kramer, k., kruchten, b., hahn, c., janot, j., fleck, s., & braun, s: The effects of kettlebells versus battle ropes on upper and lower body anaerobic power in recreationally active college students, journal of undergraduate kinesiology, research volume 10 number 2 spring,31- 41, 2015.

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<http://www.theguardian.com/lifeandstyle/2007/jun/05/healthandwellbeing.health>