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The effect of skilful physical exercises in a high-intensity interval training method by changing rest periods on the development of some physical and skill abilities and aerobic capacity of handball players

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Abstract

The study aims to:

- Preparing skilful physical exercises in a high-intensity interval training method by changing rest periods to develop some physical abilities, skills and aerobic ability under study among handball players.
- Recognizing the effect of physical and skill exercises in a high-intensity interval training method by changing rest periods on some physical, skill and aerobic abilities of handball players.

The researcher assumes the following:

- There are statistically significant differences between the two research groups (experimental and control) for the pre and post-tests in the development of some physical abilities, skill and aerobic ability of handball players.
- There are statistically significant differences between the two research groups (experimental and control) for the post tests in the development of some physical abilities, skill and aerobic ability of handball players.

The research community was represented by the Kirkuk girl handball players for the season 2020/2021 and their number (18) players, and (2) of them were excluded because they are goalkeepers, so the number of sample members (16) players constituted (88.88%) of the research community, and they were divided into two groups Each group includes (8) players of the first group (experimental) to whom the exercises prepared by the researcher were applied, while the second group (control) applied the exercises designed by the trainer

Conclusions:

- Exercising by changing rest periods had a significant impact on improving the physical and skill side of the research sample members.

Keywords: interval training, high intensity, change of rest periods, aerobic capacity, handball.

1. Introduction

The handball game is one of the games that requires a high effort, especially if we know that the team resorts to attacking all members of the team and has to return to the defense of all team members, which requires the team to be highly prepared as well as skillful preparation

High-intensity exercise is one of the most important techniques for modern and current training.

(Gina Harney, 2015) This strategy means switching between a period of maximum effort and a period of rest, which is one of the fastest, most effective, and most effective exercises for the heart and blood vessels. The science of health and fitness has spread its effectiveness and great impact in most countries, which have achieved impressive results. and positive, Therefore, there have been great trends to wish and develop physical fitness, and the exercise of periodic, high-intensity exercise came to stay and continue [1]

This training is for short periods, but it is highly effective and impactful, which makes it ideal and highly productive for people who are always busy.

(James Driver, 2012) At present, high-intensity interval training is one of the very important methods that attract many individuals who have tendencies towards a healthy body and fitness [2]

The first use of this method, (high intensity interval training) may date back to 1912, but to be realistic, ancient humans and what they call cavemen were practicing this technique unintentionally and unintentionally by escaping by running and quickly, from predators, and the first recorded record For high-intensity interval training for athletes (endurance, arena, field and running games of different distances) who benefited from this method and strategy for physical fitness in order to improve their performance and most of the gold medal winners and advanced in the Olympics at the beginning of the twentieth century and whose successes and victories contributed to the support and development of interval training (Sage Surefire (2015) [3].

While the high-intensity interval training technique has proven to be of great benefit to advanced athletes, it has at the same time contributed to improving and developing the performance of dieters who are trying to get a healthy and fit body.

(Stephanie Ridd, 2016) This is the fastest, easiest and most effective method in achieving physical fitness, maintaining body health and building a graceful body. Intensity is necessary for any person working to apply this method to reach physical fitness [4]

The high-intensity interval exercise is a method that directly affects the heart and blood vessels for short periods, from large and high efforts that follow rest times, the high-intensity interval exercise is quick exercises that do not take more than half an hour (30 minutes), the player can perform these periods With any method that suits the condition of the heart and is beneficial for it (such as (cycling, jumping, running, running, team games, rowing, going up and down stairs, various exercises and exercises for jumping) and these exercises require strength, speed, endurance and performance of movements by exerting maximum strength at the same time. narrow and short) as in the game of handball.

As for the duration of the exercises, they can be adjusted according to the level of physical fitness of the individual, and the experienced in exercises and advanced players can perform these exercises and exercises for less time than the beginners (less time for rest and more efforts in exercises).

And (Dexter Poin, 2014) sees, while the novice does long intermittent periods when exercising, he uses less intensity and intensity than the trainees and advanced, and thus the trainee trains more and with greater effort with less and shorter time of rest, unlike beginners [5]

The researcher has noticed that the coaches use this method, but they lack to deal with the sample on the basis of the age group or the level that the player reaches, and even on the level of the player's gender because they are delicate matters that the coach should take into consideration because of their great importance in taking into account Differences in exercise use for each of these categories.

The researcher finds that studying these matters is one of the aspects that trainers should pay attention to and work on, and this is what prompted the researcher to study this training aspect to address the problem of choosing high-intensity exercises with variable rest periods, through which it is possible to develop some physical and skill abilities that fit the type of exercise. Work as well as the development of anaerobic ability, which is often relied upon during the overall performance in the match.

The study aims to:

- Preparing skillful physical exercises in a high-intensity interval training method by changing rest periods to develop some physical abilities, skills and aerobic ability under study among handball players.
- Recognizing the effect of physical and skill exercises in a high-intensity interval training method by changing rest periods on some physical, skill and aerobic abilities of handball players.

The researcher assumes the following:

- There are statistically significant differences between the two research groups (experimental and control) for the pre and post tests in the development of some physical abilities, skill and aerobic ability of handball players.
- There are statistically significant differences between the two research groups (experimental and control) for the post tests in the development of some physical, skill and aerobic abilities Handball players.

Method and tools:

The researcher used the experimental method by designing the experimental and control groups with two tests, pre and post tests, which fit the nature of the research problem.

The research community was represented by the Kirkuk girl handball players for the season 2020/2021 and their number (18) players, and (2) of them were excluded because they are goalkeepers, so the number of sample members (16) players constituted (88.88%) of the research community, and they were divided into two groups Each group includes (8) players of the first group (experimental) were applied to the exercises prepared by the researcher, while the second group (control) they applied the exercises designed by the trainer, and table (1) shows the distribution of the research sample members.

**Table (1)
Shows the distribution of the two samples**

The research sample	number of players	percentage
experimental group	8	44%
control group	8	44%
The excluded / goalkeepers	2	12%
total summation	18	100%

Pre-test:

The researcher conducted the pre-test on the two research groups (experimental and control) on Sunday 9/5/2021 in the Sports Hall / Directorate of Sports Activity Kirkuk and in the presence of members of the assistant work team. In addition to recording the results of the players in the data collection form prepared for this purpose to be processed statistically after completing the experiment.

The exercises used:

A set of high-intensity physical and skill exercises was prepared, taking into account the change in rest periods. The exercises were divided into two medium sessions of (8) weeks, as each week includes (3) training units, and the total number of training units became (24), As exercises were used that were designed by the researcher and by (3) exercises in the training unit, and they were applied on (Saturday, Monday and Wednesday) days of each week, and the exercises were applied in the main part of the training unit as the load ripple used was (3:1) And starting from Saturday 13/3/2021 and Table (2) shows a model of the training unit used in the research

Table (2) Model showing the components of the training load for high-intensity exercise Week: The second training method: Interval, high intensity Training unit: 4th + 5th + 6th Intensity: 80-90% Time of the applied exercises: (29.7 minutes, 28.6 minutes, 29.8 minutes) Training unit time: 75-90 minutes Main part time: 35-45 minutes

Objective of the training unit	total summation	Total total work and rest time	Total total working time	Rest between sets Total rest time	Rest between repetitions	number of repetitions	number of totals	exercise time Number of totals	exercise time Number	Exercise Average	today
Special table + aerobic ability + skill side	1686s	562 s	136 s	426 s	120 s	51 s	4	2	17 s	3	Saturday
		632 s	128 s	504 s	120s	64 s	4	2	16 s	38	
		588 s	144 s	444 s	120 s	54 s	4	2	18 s	12	
Aerobic ability + stretching + shooting	1634s	562 s	136 s	426 s	120 s	51 s	4	2	17 s	5	Monday
		568 s	112 s	456 s	120 s	56 s	4	2	14 s	9	
		588 s	144 s	444 s	120 s	54 s	4	2	18 s	13	
Aerobic ability + shooting	1608s	632 s	128 s	504 s	120 s	64 s	4	2	16 s	6	Wednesday
		588 s	144 s	444 s	120 s	54 s	4	2	18 s	11	
		568 s	112 s	456 s	120 s	56 s	4	2	14 s	17	

Note: The rest periods have been changed with a work-to-rest ratio (1:3 - 1:4) that matches the training method used

Examples of high intensity exercises used



The pregnancy ripple used by the high intensity interval training method, which is compatible with high intensity training by changing the rest periods, which were divided into two medium cycles of eight weeks.

Second course				First course				intensity
Eighth week	Seventh week	Six week	Fifth week	Forth week	Third week	Second week	First week	
								90
								88
								83
								80
80 m	90,5 m	87 m	85,2 m	80 m	89,5 m	88.1 m	76 m	Time minute
4800 s	5430 s	5220 s	5112 s	4800 s	5370 s	5286 s	4560 s	Time second

Figure (1)
Training load ripples for weekly cycles

Post-test:

The researcher conducted the post-test on the two research groups (experimental and control) on Sunday 9/5/2021. The researcher was keen to provide the same conditions and the sequence of tests that were applied in the pre-test.

Results:

General rules when doing interval training exercises [6]:

The duration of the exercise is 14-90 seconds for each repetition, and the rest between iterations is similar to the training time, or it can extend for three times the duration of the exercise or half the duration. his own.

- The rest time is reached at the heart rate level of 85%, that is, do not make the heart rate fall below this high rate.

Table (3)

Arithmetic means, standard deviations, calculated (t) value, (sig) value and significance level for the pre and post tests of the physical and skill abilities of the experimental group

moral	Indication level	Values	dimensional		tribal		measruing unit	the test	Seq
			σ	μ	σ	μ			
moral	0.000	5.602	1.129	36.221	4.013	42.764	a second	Aerodynamic Endurance	1
moral	0.026	- 3.061	13.527	103.800	17.570	98.300	meter	partridge	2
moral	0.001	- 4.709	1.547	9.600	2.596	5.750	Degree	handling	3
moral	0.000	- 6.000	2.311	26.689	3.888	22.699	Degree	shooting	4

(*) Significant if the significance level is > (0.05).

Table (4)

Arithmetic means, standard deviations, calculated (t) value, (sig) value and significance level for the pre and post tests of the physical and skill abilities of the control group

Moral	Indication (sig)level	values (t)	Post test		pretest		measruing unit	the test	Seq
			σ	μ	σ	μ			
moral	0.000	4.856	2.609	40.600	4.015	43.700	a second	Aerodynamic Endurance	1
moral	0.045	-3.158	14.679	100.450	17.350	99.670	meter	partridge	2
moral	0.012	-4.900	1.960	7.680	2.599	5.800	Degree	handling	3
moral	0.001	-5.895	2.845	23.231	3.780	21.890	Degree	shooting	4

(*) Significant if the significance level is > (0.05).

Table (5) Arithmetic means, standard deviations, calculated (t) value, (sig) value and significance level for the post test of physical and skill abilities for the experimental and control groups.

Indication	Value	calculated	Experimental group		Experimental group		measuring unit	the test
			σ	μ	σ	μ		
moral	0.000	3.906	1.129	36.221	2.609	40.600	a second	Aerodynamic Endurance
moral	0.048	-2.090	13.527	103.800	14.679	100.450	meter	partridge
moral	0.035	-2.900	1.547	9.600	1.960	7.680	Degree	handling
moral	0.004	-3.720	2.311	26.689	2.845	23.231	Degree	shooting

(*) Significant if the significance level is > (0.05).

Discussion:

It is very necessary that the coaches choose exercises, whether physical or skill, that serve the specifics of the effectiveness, and use the tools and means that he finds to develop from the level of the athlete. Taking into account the training principle that is known as privacy, so the choice of exercises must stimulate the characteristics of the game played by the player as it is in team games, including the game of handball [7, 8].

And (Aguar atal 2012) believes that the use of conditions and restrictions according to the goal of training, such as determining the type of handling with the ball and moving within certain conditions, greatly develops the player’s mentality, increases speed, and makes the appropriate decision in the skill and physical performance, and leads to a state of literal application of the coach’s directives.[9].

The researcher believes that it is necessary that the exercises that are applied in the training units be similar in performance and what is happening in the competition during the match, and the other thing is that these exercises serve the variables for which they were developed in order to achieve the greatest possible benefit.

Table (6) Arithmetic means, standard deviations, calculated (t) value, (sig) value and significance level for the two tests, before and after the aerobic capacity of the experimental group

moral	Indication (sig)level	Value (t)	Post test		Pretest		measuring unit	the test	Seq
			σ	μ	σ	μ			
Moral	0.000	5.568	1.228	33.461	4.005	39.640	a second	aerobic capacity	1

(*) Significant if the significance level is > (0.05).

Table (7) Arithmetic means, standard deviations, calculated (t) value, (sig) value and significance level for the pre and post tests of aerobic capacity for the control group

moral	indication (sig)	Value (t)	Post test		Pretest		measuring unit	the test	Seq
			σ	μ	σ	μ			
Moral	.0001	4.882	1.084	34.399	4.089	39.694	a second	aerobic capacity	1

(*) Significant if the significance level is > (0.05).

Table (8) Arithmetic means, standard deviations, calculated (t) value, (sig) value and significance level for the post test of aerobic capacity for the experimental and control groups.

moral	Indication level sig	Value t	Post test		pretest		measruing unit	the test	Seq
			σ	μ	σ	μ			
Moral	.003	4.020	1.228	33.461	1.084	34.399	a second	aerobic capacity	1

(*) Significant if the significance level is > (0.05).

Discussion

This type of exercise has a special character in training for maximum speed and general endurance through rapid movements to perform, as (Jones, Brust) points out, "In order to develop aerobic capacity, it is preferable to use exercises that are appropriate to the type of performance on the field. The players who are constantly exposed to such situations improve their decision-making and anaerobic ability.[10].

And (Mustafa Mohamed, 2011) adds, "The player's possession of various forms of performance similar to the requirements of the match allows him to choose the best position from the actual playing situations that increase his ability to maneuver and implement plans in different directions and places and is not surprised by situations that have not been trained on, and then achieve The speed of the skillful performance characterized by strength and compatibility in the implementation of the skill and tactic duties [11].

(Macardle, 1981) finds that "the specificity of training creates special adaptations that are generated from the effects of the training process" [12] and (Fox & Mathews, 1974) sees that the principle of privacy in the working energy system is one of the most important training principles in the training process" [13].

Also, (Davis & Kimmert 2001) confirms in this field that "special training increases the efficiency of the work of the working energy system" [14]

And through the continuity of the process of pressure on the phosphine and lactic system, which was dominant in the process of energy production with all skill exercises, it led to the effect on the various body systems and the occurrence of physiological adaptations in a good direction among the players of the experimental research group.

Conclusions:

- Exercising by changing rest periods had a significant impact on improving the physical and skill side of the research sample members.
- The high intensity exercises make the players highly efficient and give them the greatest confidence on the field during the competition because of their important and distinctive role in raising the physical, skill and aerobic aspect.
- The legalization of periods of work and rest and what suits the levels of the research sample members has a positive role in raising the variables targeted by the researcher.

References

- [1] Gina Harney. the fitnessistas get more from less workout and diet plan to loss weight and feel great fast, demoes health .New York, p.p50, 2015.
- [2] James Driver. high intensity interval training explained, Create space Independent Pub, p.p20, 2012 .
- [3] Sage Surefire. Get Hiit Fit - Fast-Track Your Way to a Shredded Super-Fit New You with Hiit Workouts, Create Space Independent Publishing Platform, p.p1, 2015 .
- [4] StephanleRidd. The Secret Fast and Easy Way to Burn Fats and Maintain A Healthy Cardiovascular System Today, Eljays-ePublishing, p.p40, 2016.
- [5] Dexter Poin.High Intensity Interval Training: Hiit Is for Dummies , Create space Independent Pub, p.p66, 2014.
- [6] <https://leaga.com/what-is-hiit-and-its-benefits-and-a-suggested-hiit-table> .
- [7] Toplica, S, Radmila, K, The effects of the polymeric sport training model on the development of the vertical jump of volleyball players, Physical education and sport, Vol .1, N9 P11-25, 2002.
- [8] Hussein, A. J., Special features of development planning of speed and strength abilities of young volleyball players at the stage of initial training for *competitive activities*, Physical Training of Students of Creative Profession, 1 (2), 55-57, 2001.
- [9] A guiarM ,etal: (A Review on the Effects of Soccer small – sided Games" (Jurnal of Human Kinetics volume, Section III– Sports Training Sectors III – Sports Training, P. 103, 2012.
- [10] Jones , S & Drust , B " Physiological and technical demands of 4 vs. 4and 8 vs. 8 in elite youth soccer Piayers' , Kinesiology, P. 39 , 2007.
- [11] Mustafa Mohamed Gendy; The effect of a training program using skill exercises in mini-pitches on some offensive tactical principles for junior footballers in Assiut Governorate, unpublished master's thesis, Faculty of Physical Education, Assiut University, p. 81, 2011.
- [12] Macrdle, W.O: "Exercise Physiology, energy, Maturation and Human performance , Lea and Fibiger, p.268, 1981.
- [13] Fox and Mathews : Interval Training , Conditioning for sport and General Fitness :(W.B. Saunders Company , Philadelphia, P.10, 1974 .
- [14] Dives &Kimmet; " The physiology of fitness" , published by Macmillan, Australia, p.79,2001.

