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The Effect of a Method Using (Hypoxic and Altitude) Exercises on the Development of Special Muscular Endurance and Skill Performance of Young Judo Players

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ABSTRACT

In order to develop judo players in this event, it is always necessary to choose physical abilities that suit their requirements, such as in training, and to use means and methods that help improve the efficiency of functional devices of judo players and raise their physical ability, is hypoxic and altitude training, preparing a training curriculum using hypoxic and altitude exercises, to develop the special muscular endurance of judo players for young people. _For the research sample, hypoxic training contributed to raising the efficiency of the work of functional organs, such as: respiratory and muscular systems, on their performance in training despite the lack of oxygen received to them, and as a result, the results appeared significant in the development of endurance ability in the post-tests.

The use of masks as a means of hindering breathing and training heights with training has successfully contributed to the events of physiological changes in the body of judo players.

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1 Introduction to the research

1 1 Introduction and the importance of the research

Sports achievements in all sports, including judo, continue to develop forward from time to time, which indicates that efforts are being made by specialists and trainers to reach the best methods, means and methods that are used to achieve new sporting achievements by conducting studies and researches to prove this scientifically.Judo, like other competitive sports that require some physical qualities and motor abilities that qualify players to represent their country in sports forums, is one of the most important factors that achieve victory in judo Existence Many factors include the modern training method, so you should check carefully when training using the scientific method based on the availability of What he has It is a requirement that qualifies the player to reach the highest levels, because the game of judo, like other games, in which the player needs some characteristics and various means of training to be a pillar The development of this event also requires special physical and motor abilities and requirements commensurate with its performance and the energy system that works in it is the energy system Oxygen Lactic because its performance time falls within the time of this system between 30 **Second** Up to 5 **One minute** .(1) Muscular endurance is one of the most important elements needed for practicing sports, as it is a necessary element to complete the requirements of sports, whether they are team or individual, as trainers in all sports strive to develop this element Through training through several means, including **Hypoxic and Heights** Therefore, in order to develop judo players in this event, it is necessary to choose physical abilities that are commensurate with their requirements, as in choosing training methods in the implementation of exercises used in training, and the use of means and methods that help improve the efficiency of the functional devices of judo players and raise their physical ability, and thus affect the improvement of achievement from the means that are not common at the local level. **Hypoxic** This means a lack of oxygen in the muscle tissues, especially the working ones, and this is an influential factor in the muscular work in contraction and diastole and leads to a decrease in the ability to continue performing at high intensity as a result of the biochemical variables that appear as a result of the intensity of performance and lack of oxygen, especially lactic acid.

The oximeter is also one of the devices used by doctors and athletes to measure the percentage of blood oxygen saturation for the purpose of knowing the lack of oxygen in the blood during the performance of sports training. Highland training is important for judo players, Studying the Effect of Hypoxia Exercise (**Hypoxic and Heights**) to develop Muscular endurance Judo players.

1 2 Research Problem:

Judo is one of the games that needs physical fitness and motor that is performed with maximum intensity due to the need for physical requirements, including muscular endurance, the researcher noticed through training the preparation of a curriculum and programs in the development of this event that requires additional overlapping physical and physiological requirements, from a physical point of view, special muscular endurance is one of the most important, so it is necessary to think about finding methods, methods and training means that

1 Muhammad Reda Ibrahim: Field Application of Theories and Methods of Sport Training , 1st Edition, Baghdad, Office Al-Fadhli, 2008, p. 483.

work to raise the efficiency of the functional and physical devices of the player to continue his performance at high intensity resisting. Fatigue and lack of oxygen,

The accumulation of lactic acid in the muscles that generates fatigue that hinders the continuation of high-intensity performance is the most important characteristic of this event, and there are many means and methods that are used in training, and **hypoxic is** one of the means used in training internationally, especially in high-intensity events in which there is a lack of special oxygen for judo players.

Therefore, the researcher conducted a field study using (**hypoxic and high-altitude) exercises** using an oximeter to measure the percentage of oxygen deficiency that is used in training locally, as well as the use of mouth and nose masks to hinder air inhalation, as well as the use of a little rest between exercises with a heart rate index that is not returned in a way that meets the body's need for oxygen consumed during competition with the opponent and the use of these exercises to develop special muscular endurance. For the players of goodnessand.

1 3 Research Objectives

1. Preparation of **hypoxic and high-altitude exercises,** in the development of special muscular endurance for young judo players.

2- Preparing a training curriculum using hypoxic **and altitude exercises, to develop** the special muscular endurance of judo players for young people .

2. Knowing the effect of the training curriculum using hypoxic **and altitude exercises** to develop the special muscular endurance and skill performance of judo players for youth.

1-4 Research Hypotheses

1. There are no differences between the results of the pre- and post-tests of the control and experimental groups in the research variables.
2. There are no differences between the results of the control and experimental groups in the pre- and post-test in the research variables.

1.5 Research Areas

1.5.1 Human domain

A sample of Iraqi judo wrestlers in the youth category of 18-20 years old, who are (16) judo wrestlers of Dhi Qar Judo Training Center .

1.5.2 Temporal domain

The limited time period of (22 / 4/200) until 19 / 11 /200 .

1.5.3 Spatial domain

Dhi Qar Judo Training Center Hall.

1- <u>Research methodology and field procedures:</u>

3−1 Research Methodology:

The research method means "the method used by the researcher to answer the specific questions raised by his research topic"[2], so the choice of the scientific method must be consistent with the problem to be studied, so the researcher will use the experimental method by designing the two equal groups with a pre- and post-test for their suitability and the nature of the problem.

3−2 Research Population and Sample:

1- Ali Maher Khattab and Nabil Abdel Zahar, Foundations of Research Methods in Education and Psychology: (Cairo, Ain Shams Library, 2005, p. 9).

The research community is the vocabulary of all the phenomena that you are studying and must be identified and enumerated, i.e. "it is all individuals, events or things that are the subject of the research problem"[3], for this reason, the researcher identified his community of young judo wrestlers aged (18-21) years and for the 2018 season, which numbered (30) players weighing (60-66) kilograms, for the clubs of Dhi Qar governorate, represented by Al-Furat Club and Al-Nasr Club , then the researcher deliberately selected (16) judo wrestlers representing the clubs (Al-Furat, Al-Nasr Youth Forum, Souk Al-Shuyoukh Al-Nasr (with (8) judo wrestlers from each club, four of each weight (60-66) kilograms are among the main weights*, as one of the reasons that led the researcher to choose these weights for his research sample is the frequent use of the skills in question by the wrestlers of these weights, as well as his experience of most of the players of these two weights during his career as a judo wrestler, and the research variables were randomly distributed to the two research groups, as the sample represented (53%) of the original research community.

The homogeneity of the research sample in the variables contained in it due to the values of the torsion coefficient, and in order to reach the validity and accuracy of the results, the researcher conducted homogeneity among the members of the research community according to the variables (height - weight - temporal age - training age) using the torsion coefficient after extracting the arithmetic media, the median and the standard deviations, and then the torsion coefficient for each variable as shown in Table (2).

Table (1)

Shows the homogeneity of the research sample in height and weight, chronological and training ages

Torsion coefficient	Standard deviation	Broker	Arithmetic mean	N	**Unit of Measurement**	Variable
0.147	6.129	169	169.3	10	Poison	Length
0.313	9.081	59.5	60.7	10	kg	Weight (mass)
1.179	0.707	18	18.5	10	Year	Chronological age
-0.223	0.876	5	5.1	10	Year	Training Age

It was confined between (+3) which shows that it is within the normal curve of distribution.

1. ∗ Significant at the significance level of < (0.05)

3-3 Tools, Means and Devices Used in the Research:

3.3.1 Means of data collection:

- Note.
- Tests.
- Arab and foreign sources.

Muhammad Abdel Fattah Al-Sarfi, Scientific Research (The Normalization Guide for Researchers), 1st Edition: (Amman, Wael Publishing and Distribution, 2002, p. 185).

The main weights prescribed for the youth category aged (18-21) years according to the International Judo Wrestling Law are (55, 60, 66, 73, 81, 90, 100, and above 100) kg.

- Personal interviews.
- The form for recording the results of the tests used.:

Special muscular endurance:

1. Vertical arm tension (cord pull)[4]

- Purpose of the test: to measure the muscular endurance of the arms and shoulders in rope climbing, and the results of this test can be used as an indicator of the odds of an individual excelling in some sports activities.
- Necessary tools: climbing rope, Chinese runway tape, chair or bench at least 35 cm high, adhesive tags fixed to a raised table rope
-Test Instructions:

A. The laboratory wears shorts and a light t-shirt without a belt

b. The arbitrator must be ready to label the rope immediately without
This takes a long time.

C. The cord should be kept between the thighs throughout the test performance

d. The rope shall be suspended at a suitable height so that it is perpendicular to the floor in front of the edge of the seat
between the lab thigh.

E. It gives the laboratory three consecutive attempts.

f. Any attempt by the laboratory to push the ground with feet when the test begins.

The results of each attempt are announced to the laboratory because this increases his enthusiasm.

- Calculation of grades: The lab score is the distance between the two marks calculated for the lab
Grades of the best attempt.

Figure (1) shows the vertical tension of the rope

4 Yasser Youssef Abdel Raouf, Judo and the Twenty-First Century, Nadar Al-Sahab for Publishing and Distribution, Cairo, 2005, p. 190.

2- Sitting down for 1 minute [5]

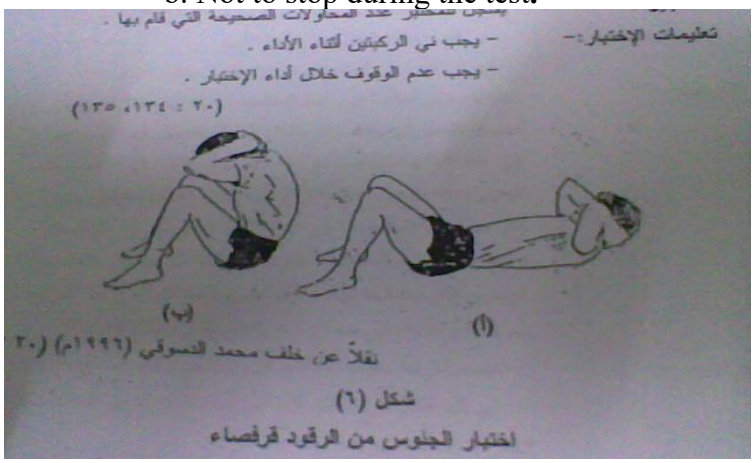
-Purpose of the test: Measurement of endurance of the abdominal muscles and the muscles of the thigh joint.

- Performance Specifications: From the position of the squat and the shrouds intertwined behind the neck, the testator bends the torso forward and down to touch the knees and pulls them backwards, and repeats the performance as many times as possible, with a colleague holding the lab's feet to the ground.

- Registration: The number of correct attempts he made.

Test Instructions: A. Bending the knees during the performance

b. Not to stop during the test.



Doubtfor (2) Explaining Sitting Down

3. Rotation (hip rotation) with two legs in place30 seconds [(6)]

- Purpose of the test: To measure the muscular endurance of hip and leg rotation.

- Tools used: stopwatch, 2 stands, 2m rubber rope

Performance Description: A- The tester stands in front of the rubber cord tied between the two stands.

B. The height of the rope from the ground is equivalent to the height of the laboratory's knee.

C. The laboratory takes the usual standing position (knees facing the rope).

P. When the start signal is heard, the laboratory rotates the hip with the leg. right, forward so that in front of the left leg is the rubber rope of Behind the knee and vice versa.

- Registration: Count the number of times the right leg touches when rotating from behind the rubber rope and then the left leg when turning from behind. The rubber cord every two touches counts as one attempt and the total working time is 30s.

Marwan Abdel Majeed Ibrahim and Mohammed Jassim: Modern Trends in Sport Training , 1st Edition: 20045

- The Effect of a Proposed Training Curriculum on the Development of the Motor Speed of Hip Rotation and 6 the Performance of Some Technical Grips

The Vehicle for Young Judo Wrestlers, Faculty of Physical Education, University of Baghdad, 2005, p. 35

4. Tilting procrastination facing the ground with the pelvis exchanging with the legs on both sides of the maximum range within 1 d.[7]

- Purpose of the test: Measurement of muscular endurance
-Tools used: stopwatch, judo mat
- Performance description: From the oblique front support position to open the hip rotation by movement

The legs are maximum, with the hands steady, once to the right, once to the left.

-Registration: The number of times left and right is calculated once during the working period within 1 day.

5- Repeat-Seo-Naji Throw Test with the Index for 30 seconds ([8])

- Test objective: Measurement of performance muscular endurance (anaerobic capacity)
- Test method: perform the throw of two times - SEO - Navi with the indicator from standing
- Advantages of the test:

1- It is considered a good training to develop the endurance of special speed or anaerobic capacity
2- Easy to understand and apply
3- It does not need expensive tools or devices
4- Performing the test does not need a long time
5- The test is considered to be training for the most common skills in the sport of judo.

- Tools: Stopwatch - Judo Mat - Indicator - Judo Suit
- Performance Method or Specifications: Same method as the previous test specifications
-Recording, i.e. recording the number of throws within 30 seconds
- Test Instructions: Same as the previous test instructions.

6. To measure the level of specialization ("Spezieltechnik"[9]):

Purpose of the test: Ability to know the degree of performance mechanism for the specialized skill of Morute Seonagi.

Tools used: Judo mat and judo suits.

Performance Description: There are three players on the mat between each player and the last one meter away, and the tested player stands in front of Player No. 1 with their normal holding "Kumi-Kata" together and taking the natural stance position (Shizen-Tai) after the order to start "Hajime" is issued, the tested player throws Player No. 1 and then lets him get up the goaltending player very quickly, and at the same time the tested player performs the same skill with players No. 3, 2, then starts with Player No. 1, and so on.

The following graphic shows where the players stand and the running line of the tested player:

Scoring method: All throws made within 1m and match the correct throwing conditions as well as the purity of the skill level of the performance will be counted and given a full point " Ippon". After the start of the throw and the end of the specified time, the throw is counted in the event that the goalkeeper's feet have left the mat, i.e. the player has been carried, and any of the three players is replaced by another if it appears that he is helping the tested player, such as jumping with him, or any other performance that has a negative impact on the measurement of the level.

- Rabi' Liftah Dakhil, ibid., p. 447

Mariner . J.L.:E . Judo – Weight-Lifting on The universal gym. Judo on tarionusletter. 1978 -

Murad Ibrahim Tarfa, Judo between Theory and Practice, Dar Al-Fikr Al-Arabi: 2001, p. 412.

7. Biocapacity Test (10)

- **Objective of the test:**

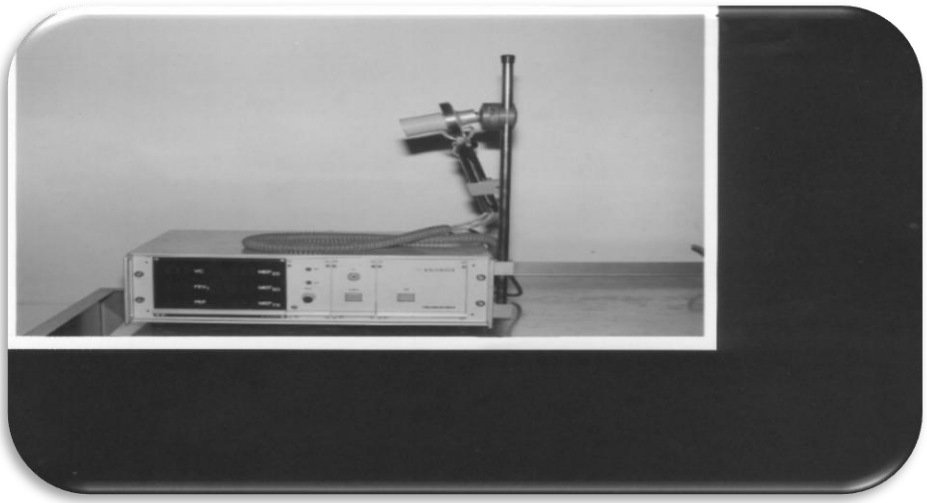
Measure the rate of vital capacity.

- **Tools** :
  - The bioampire measurement device as shown in Figure (6).
  - A chair for the player to sit on.
- **Test Description**:
  - The tester sits down and holds the device in the fist of the hand, then takes the maximum inhalation, then puts his mouth on the device's smile to let out the maximum exhalation and puts a nose mask to take into account that no part of the exhaled air comes out through the nose, and then the reading is recorded, allowing the laboratory to make three attempts to calculate the best of them. The rest time between one attempt is (15) seconds.

Figure (4)
Shows the spirometer for measuring biocapacity

Table (2)

It shows the arithmetic media, standard deviations, calculated (v) value, (Sig) score, and



the significance between the experimental and control research groups in the tests of special muscular endurance and skill performance, tribal vital capacity.

Significance	Degree (Sig)	(v) Calculated	Control Group			Experimental Group			Exams
			±S	Going to	N	±S	Going to	N	
Girdahl	**0.342**	**0.87**	**1.22**	**10.77**	**8**	**1.25**	**11.87**	**8**	**Vertical Tension of**

1 Kamal Darwish: The Physiological Foundations of Handball Training, 1st Edition, Cairo, Al-Kitab Center for Publishing, 1998. Page 58

									Arms (Cord Tension) Distance
Girdahl	**0.745**	**0.321**	**6.77**	**45.37**	**8**	**6.78**	**48.34**	**8**	**Sitting from lying down 1 minute once**
Girdahl	**0.343**	**0.343**	**2.46**	**6.00**	**8**	**2.34**	**6.27**	**8**	**Rotation (hip rotation) with two legs moving in place 30 seconds**
Girdahl	**0.443**	**0.867**	**1.34**	**8.45**	**8**	**2.67**	**10.66**	**8**	**Tilted prostrate open facing the ground once**
Girdahl	**0.543**	**0.624**	**1.42**	**11.50**	**8**	**1.45**	**12.55**	**8**	**Test of throwing two times, sio, and save once.**
Girdahl	**0.342**	**0.978**	**2.40**	**11.40**	**8**	**2.34**	**12.99**	**8**	**To measure the level of specialization Once**
Girdahl	**0.378**	**0.867**	**0.34**	**5.56**	**8**	**0.23**	**5.242**	**8**	**Vital Capacity Tester Apparatus**

Exploratory experiment of the exercises used in the research

The researcher conducted this experiment on 20/2/2025Thursday until 27/2/2025 and on the wrestlers of the experimental research sample, and it was carried out in the hall of the training center Dhi Qar Dhi Far, during the period of the training exercises to know the distributions of attempts, repetitions and the time it takes to perform each exercise, as well as to know the maximum values of each exercise to benefit from them in rationing the intensity of the exercises used, as well as to know the suitability of the exercises and their application, and to inform the assistant team of the nature of the exercises and how the pulse of the sample members is measured due to the need for this within determining the percentage of partial and total intensity for the main part of the training unit, and one of the results of this experiment is that it helped the researcher to lay the foundation in

Accordingly, the two survey experiments helped to know the following points:

- Diagnosing and overcoming the negatives and obstacles facing the researcher during the application of the main experiment.
- Learn how to use an oximeter to measure blood oxygen.

3 Main Experiment Procedures:

3-7-1 Tribal Tests:

The researcher conducted the pre-tests on the research sample on Friday and Saturday, 28/3/2025 and 30/3/2025 at ten o'clock in the morning in a judo hall (Dhi Qar Training Center) and gave the researcher a brief explanation of how the tests were performed.

(Curriculum developed using the Hypoxic Training and Selected Heights training exercises:

After the researcher conducted the pre-tests on his selected sample, a methodology was prepared that used **hypoxic and altitude exercises** for the research sample, and these exercises were organized and relied on scientific sources in sports training and judo wrestling, and these exercises are used in the main section of the training unit, while the control group was under the supervision of the trainer and his own methodology that follows, the training on Saturday 20/4/2025 The training curriculum included (24) training units for (8) training weeks at a rate of (3) training units per week of the training module.

- ✓ Hypoxic **and high-altitude training** is the highest level of training in terms of suitability for this type of training that cannot differentiate it from a real match.

- The training curriculum prepared by the researchers on **hypoxic and altitude exercises**, which was considered a training method used to develop the efficiency of judo players by using two methods, the first was masks placed on the nose and mouth and altitude training , which hinders the proper breathing process during exercise, which leads to a lack of the amount of oxygen entering the body, which causes fatigue and makes functional organs work in the absence of oxygen. Curriculum for the .
- Using 140 z/d, there will be difficulty in the rest period, and this was the researcher's goal of using the two methods, hypoxic and altitude exercises, noting that the second method was not previously used in hypoxic exercises.[11]
- In order to monitor the lack of oxygen in the blood and to stabilize it, the researcher used an oximeter for the first time, as shown in Figure (6), and it was used after the end of each exercise by placing it in the player's finger so that the reading of the device shows the amount of oxygen saturated in the blood, and if there is a deficiency, it is an indication that the exercise is within the desired goal. The individual differences in terms of

[11] Ali bin Saleh Al-Harhouri: The Science of Sport Training , Benghazi, Fazion University Press, 1994

function, physiology and specificity of the sample members were clear when measured by the device, and therefore the duration of performance and rest was different among the sample members, so it was difficult to determine the duration of hospitalization for each patient. The recovery exercises given by the researcher helped to return the pulse to the required number using the flexibility exercises appropriate to the breathing system in terms of inhalation and exhalation, which helped to return the required pulse. The researcher used the device to know the runner's pulse as well, because the rest proven in the training curriculum depends on the pulse that the judo player reaches in order to retrain again.

- The number of training units reached 24 units at an average of 3 training units per week, distributed on Saturdays, Mondays, and Wednesdays, and this was confirmed by (Abu Al-Ela and Ahmed Nasr Al-Din) on the fact that the speed endurance is given from 2 to 3 times a week, and hypoxic **and altitude exercises**, and the duration of the curriculum took 8 weeks for the period from 20/4/2025Thursday to 20/7/2025Friday.[12]
- The first month (1-3) was also used to gradually raise the load in the second and third weeks and then reduce it in the fourth in preparation for the second month, as the training intensity in the first week was 85%, the second 87%, and the third 90%. In the fifth week, other more specific exercises were used, as the intensity was 90%, the sixth was 92%, and the seventh was 95%, the training was done by the method of high-intensity and low-intensity interval training to suit the type of physical abilities and the sport of judo wrestling.
- The training unit time according to what the players were training was (5-9) minutes, and the training time in the proposed device was (20-30) minutes at the beginning of the main section in the units.

[12] - Muhammad Reda Ibrahim: Field Application of Theories and Methods of Sport Training , 1st Edition, Baghdad, Al-Fadhli Office, 2008

- The training intensity of the exercises mentioned in the curriculum has been determined as follows:
- Maximum force = the largest horizontal or vertical distance, representing the maximum intensity, and the required intensity is in relation to the maximum distance.
- Maximum power = number of maximum repetitions × required intensity / 100..... ( )
- The researcher raised the partial training intensity by increasing the number of repetitions of the exercise and fixing the performance time with the fixation of the rest period time in relation to the strength endurance with the principle of rest between one exercise by (1-1), and to increase the training intensity of the strength characterized by speed by increasing the number of repetitions and fixing the rest periods between one exercise by (1-2) according to the requirements of the competition between the runs, which is (30) seconds. In order to increase the training intensity of maximum strength by increasing the number of repetitions and fixing the rest periods between one exercise by (1-3), the researcher took into account the allocation of rest time between groups, and the researcher wanted to reach the player to the format according to the requirements of the game.
- Measurement indicators (important for research)
- Heart rate after exertion
- Return to normal time
- Consistency of technical performance
- Tolerance to respiratory fatigue

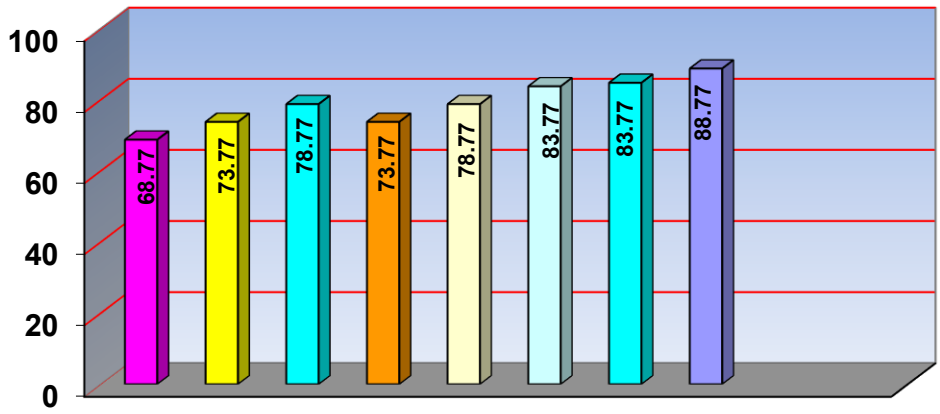


Figure (5)
A chart showing the intensity of the weekly training load of the program

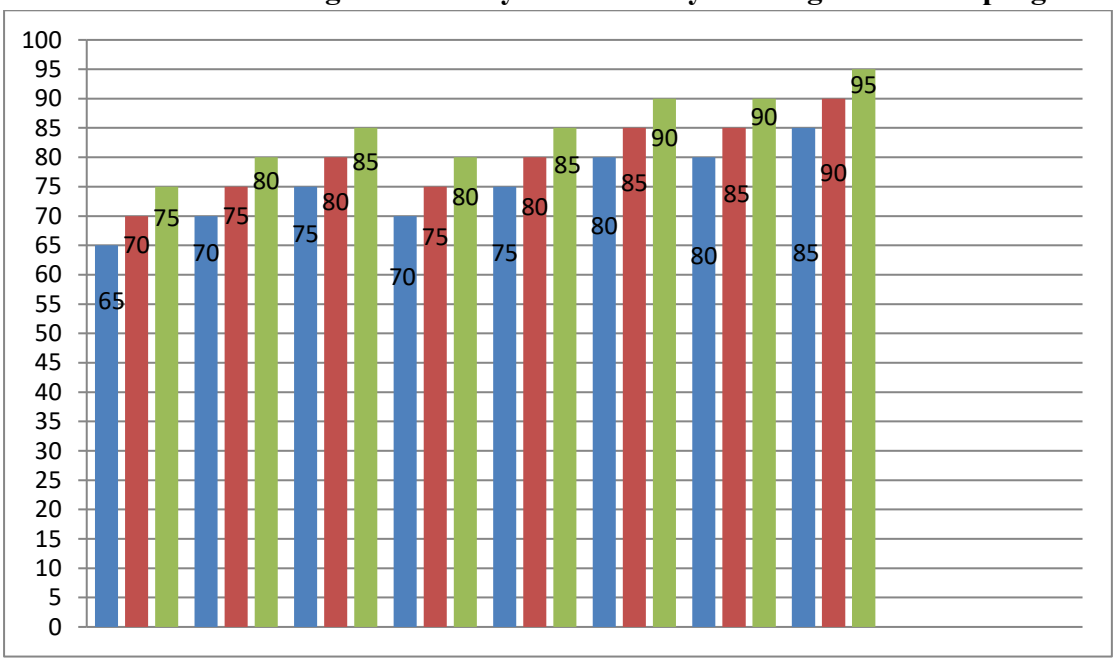


Figure (6)
Explains the daily training intensity during the application of special exercises for (8) weeks.

3.7.4 Post-tests :

The post-tests of the research sample were conducted on 23/7/2025 at the Judo Training Center in Dhi Qar, and after the completion of the period of applying the (training curriculum), the researcher was keen to provide the conditions of the same pre-tests in the post-tests.

3.8 Statistical Methods:

The Social Statistical Portfolio System (SPSS) was used

4.1.1.2 Presentation and analysis of test results with the pre- and post-biocapacity of the research groups:

The researcher presents the results of the pre- and post-motor abilities tests for the experimental and control groups, as shown in Figure (6):

Table (3)

Shows the arithmetic media, standard deviations, mean differences, deviation of differences, calculated value (v), score (Sig), and significance between tests with pre - and post-biocapacity of the experimental and control research groups

Significance	Degree (Sig)	(v) Calculated	A.F.	P	Post-testing		Pre-test		Collection	Test & Unit of Measurement
					±S	Going to	±S	Going to		
D	0.000	7.891	5.825		1.23	11.98	1.25	11.87	Mgt	Vertical Arm Tension (Cord Pull)
D	0.011	3.416	2.588		1.22	11.77	1.22	10.77	MgZ	
	0.001	5.882	0.14846		6.78	48.34	6.78	48.34	Mgt	Sitting from Lying Down 1 Minute
	0.046	2.421	0.10807		5.77	47.37	6.77	45.37	MgZ	
D	0.000	9.379	0.641		2.14	8.27	2.34	6.27	Mgt	Rotation (hip rotation) with two legs moving in place 30s
D	0.011	3.416	0.518		2.46	6.45	2.46	6.00	MgZ	
D	0.000	12.774	1.356		2.67	13.66	2.67	10.66	Mgt	Procrastinate open facing the ground
D	0.001	5.351	0.991		1.34	9.45	1.34	8.45	MgZ	
D	0.000	7.891	5.825		1.45	14.55	1.45	12.55	Mgt	Murti-Sio-Naji Throw Test
D	0.011	3.416	2.588		1.42	12.50	1.42	11.50	MgZ	
D	0.001	5.882	0.14846		2.34	14.99	2.34	12.99	Mgt	To measure the level of specialization
D	0.046	2.421	0.10807		2.40	12.40	2.40	11.40	MgZ	
D	0.000	9.379	0.641		0.23	6.242	0.23	5.242	Mgt	Biocapacity Test
D	0.011	3.416	0.518		0.34	5.99	0.34	5.56	MgZ	

n = 8 in each group of freedom score n – 1 significance level (0.05)

1.2.1 <u>Presentation and analysis of the results of the post-physical abilities tests between the two research groups:</u>

The researcher presents the results of the physical abilities and post-skill tests between the experimental and control groups as shown in Table (4):

Table (4)

Shows the arithmetic media, standard deviations, calculated (v) value, (Sig) score, and significance between the experimental and control research groups in the post-physical ability tests

Significance	Degree (Sig)	(v) Calculated	Control Group			Experimental Group			Testing
			+S	Going to	N	+S	Going to	N	
D	0.007	3.183	1.22	11.77	8	1.23	12.98	8	Vertical Arm Tension (Cord Pull)
D	0.019	2.653	5.77	47.37	8	6.78	58.34	8	Sitting from Lying Down 1 Minute
D	0.008	3.1	2.46	6.45	8	2.14	8.27	8	Rotation (hip rotation) with two legs moving in place 30s
D	0.014	2.797	1.34	9.45	8	2.67	13.66	8	Procrastinate open facing the ground
D	0.007	3.183	1.42	12.50	8	1.45	14.55	8	Murti-Sio-Naji Throw Test
D	0.019	2.653	2.40	12.40	8	2.34	14.99	8	To measure the level of specialization
D	0.008	3.1	0.34	5.99		0.23	6.242		Biocapacity Test

Freedom score (n-2) = 14 and significance level (0.05)

4 1 2 Discussion of Test Results and Bioamplitude[13]

The differences in the vital capacity index indicated that the type of exercise **Hypoxic and the heights** which was used in the training curriculum, which was characterized by reducing the amount of oxygen reaching the working muscles, which leads to the body's adaptation to compensate for the lack of oxygen in the blood, and this is what Ayesh (2002) pointed out: "The body resorts to compensating for the lack of oxygen by increasing the speed of breathing or increasing red blood cells."(14) Increasing the speed of breathing is the reflex

[13] Osama Kamel Rateb and Ali Mohamed Zaki: The Scientific Foundations of Swimming Training , Cairo, Dar Al-Fikr Al-Arabi, 1980

[14] Ayesh Zaitoun: Human Biology, Principles in Anatomy and Physiology , Jordan, Dar Ammar for Publishing and Distribution, 2002, p. 252.

reaction of the respiratory system to compensate for the oxygen consumed during exertion and the amount of oxygen insufficient to the muscles as a result of the wearing of a mask on the nose and mouth, which works to obstruct the oxygen entering the body, and here the body also increases red blood cells in a compensatory state for the lack of oxygen, because the binding of oxygen is related to the hemoclobin inside the red blood cells.

Regular training leads to an increase in the number of red blood cells responsible for transporting oxygen in the blood, which leads to an increase in the percentage of hemoglobin reserve in the blood, and this is indicated by (Al-Harhouri 1994) that "regular training leads to an increase in the amount of hemoclobin that is used as a reserve for oxygen transport."(15)

In addition, the breathing muscles play a role in compensating for the lack of oxygen, as the lack of oxygen in the blood reaches the working muscles, and during the little rest after high intensity. When lifting the mask from the mouth and nose, the number of breathing times increases, as well as altitude training increases the depth of breathing to compensate for oxygen, and since the breathing muscles are skeletal muscles that develop with training, the strength and degree of elasticity of the muscles increases during inhalation and exhalation deeply, which leads to Absorbing a greater amount of air during inhalation, and this is what (Abu Al-Ala) pointed out: "Since the breathing muscles are skeletal muscles, their strength and endurance can be increased through training methods to develop these muscles in terms of strength and endurance because of their importance in controlling pulmonary ventilation."(16)

Qasim Hassan Hussain (2003) also pointed out the effect of altitude training on lung function, stating that "practicing sports training regularly leads to positive functional changes in the respiratory system, and these changes achieve additional flexibility in the rib cage muscles, which increases their ability to expand and expand, which leads to an increase in the volume of inhaled air and thus helps to increase the amount of oxygen in the process of gas exchange between the blood and the alveoli and the economy of breathing due to the increase in vital capacity."[17] The altitude training method used in the training vocabulary also contributed to improving the vital capacity by improving the ability of the lungs to absorb a larger amount of air, and this was confirmed by both (Osama Kamel and Ali Mohammed, 1980) that "the most important feature of altitude training is the improvement of vital capacity because the recovery periods enable the heart to reach the highest level of blood pumping".(18)

The researcher measured the vital capacity because of its correlation between the percentage of hemoclobin saturation with oxygen that was measured by the oximeter, so the increase in saturation leads to an improvement in biocapacity, and because hypoxic exercises and the heights Physiologically directly related to the development of biocapacity.

Conclusions and recommendations

5 1 Conclusions:

Through the researcher's findings, the following can be concluded:

1. The study achieved the hypotheses and objectives of the research.

Ali bin Saleh Al-Harhouri: The Science of Sport Training , Abu al-Ula Ahmad Abdel Fattah: Source previously mentioned , [15] 2003, p. 372.

Qasim Hassan Hussein: Physiology, its Principles and Applications in the Sports Field , Mosul, Dar Al-Hekma for Printing [15] and Publishing, 1990, p. 134.

Osama Kamel Rateb and Ali Mohamed Zaki: The Scientific Foundations of Swimming Training , Cairo, Dar Al-Fikr Al-Arabi, 1980, p. 143.[15]Benghazi, Fazion University Publications, 1994, p. 27.

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Qasim Hassan Hussein: Physiology, its Principles and Applications in the Sports Field , Mosul, Dar Al-Hekma for Printing 17 and Publishing, 1990, p. 134.

Osama Kamel Rateb and Ali Mohamed Zaki: The Scientific Foundations of Swimming Training , Cairo, Dar Al-Fikr Al-Arabi, 1980, p. 143.[18]

2. The use of **hypoxic and altitude training led** to a development in the respiratory tract of judo players by increasing the number of breathing frequency, breath rate, and depth of breath that worked to show significant differences in the development of vital capacity in post-tests.
3. Hypoxic and high-altitude **training contributed** to raising the efficiency of the work of functional organs, such as: respiratory and muscular cycles, on their performance in training despite the lack of oxygen incoming to them, and as a result, the results appeared significant in the development of muscular endurance in the post-tests.
4. The use of masks as a means of hindering breathing and training heights through training has successfully contributed to the events of physiological changes in the body of judo players .

5 2 Recommendations:

In light of the conclusions, the researcher recommends the following:

1. The necessity of using **hypoxic and high-altitude** exercises in training and events for the game of jud, which is characterized by high intensity and lasts for a long and relatively long time, in which high lack of oxygen occurs, such as football, handball, boxing, squash, badminton, and tennis.
2. The use of an oximeter to measure the percentage of oxygen saturation in the blood in the field during training and in tests because it gives accurate results that help the trainer to know the intensity of the training and the lack of oxygen, because the use of the oximeter and high altitude running devices to measure the pulse gives more accurate results during the training and enables the trainer to know the intensity through the pulse.

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Total Exercise Time	Percentage of Partial Intensity of Each Exercise	Size (Frequency or time)	Pulse N/D	Comfort between groups	Number of Totals	Rest Between Repetitions	Number Duplicates	Workout time	Exercises	Main Section
2.45 KD	(60%)	4	120	20 S	2	10 S	4 times	10 S	1. Uchi-Kumi Fast and Continuous 30s	Application Part
3D	(65%)	16	130	20 S	2	–	8 times	10 S	2. Horizontal high jump 45s	
15.54 m	(70%)	15	140	60 S	3	45 seconds	5 times	4 seconds	3. Modified Burpee for Judo Goal: Simulate rapid fatigue similar to heights with a one-minute judo time grip	
15.34 KD	(70%)	15	140	60 S	3	45 seconds	5 times	4 seconds	4 Short Shuttle Run Objective: Measurement of	

									cardiorespiratory endurance Performance: Run 10–20 meters round and round heights Time: 5 minutes	
7,33 D	**(75%)**	**32**	**150**	**90 S**	**4**	**–**	**8 times**	**10 S**	5. Randori Intermittent Goal: The closest simulation of competition under oxygen stress Performance: 30 Seconds Powerful Gameplay 15 Seconds Rest 6–8 rounds	
7,33 D	**(75%)**	**32**	**150**	**90 S**	**4**	**–**	**8 times**	**10 S**	6. Running at heights 100 m uphill and down.	
6 D	**(80%)**	**30**	**160**	**90 S**	**3**	**–**	**10 times**	**30 S**	7. Climb up and down stairs test on a box (30-40 cm) for 3 minutes	
15.45 KD	**(85%)**	**24**	**170**	**100th**	**3**	**–**	**8 times**	**30 S**	8 Intermittent Randori Exercise 30s 6 Rounds	

Explain the shape and features of the oximeter in English

Pulse Oximeter

The Nonin SportStat™ is a very small, highly accurate, lightweight, pulse oximeter (oxygen saturation meter) that measures blood oxygen saturation (%SpO2) and pulse rate. SportStat can be used by a variety of sports enthusiasts, including mountain climbers, hikers, skiers, bikers, and others interested in measuring blood oxygen saturation and pulse rate. It can be used outdoors in many conditions, including high altitudes, at high and low temperatures, and even in the dark.

The SportStat is a medical quality finger pulse oximeter identical to the Nonin Onyx 9500. Due to it's unique construction it is easy to use with any finger size. Don't be fooled by so called "Medical use" vs "Sport use". In Canada (unlike in the US) there are no regulations regarding usage for these devices. The Sportstat is sold under the name "Onyx 9500" by medical suppliers charging as much as $700 for the identical device.