

## The Impact of a Recovery Program Accompanied by an Innovative Device on some Hormones, Special Strength and Achievement of Young Weightlifters

Asst. Lec. Mohammed Hussein Obaid\*<sup>1</sup> Prof Dr. Maysoon Alwan Oudah<sup>2</sup>

1Ministry of Education, Babil Governorate Education, alhashmya Education Department, Iraq.

E-mail [muhmmedalom1234@gmail.com](mailto:muhmmedalom1234@gmail.com)

2Prof., University of Babylon, College of Physical Education and Sports Science, Iraq.

[d.maysoon2020@gmail.com](mailto:d.maysoon2020@gmail.com)

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### Abstract

The Recovery process is considered a physiological condition represented in the return of the body's systems to their normal rates or as close to that as possible, and from this we can know that the correct exchange between efforts and Recovery processes is among the basic factors necessary for players to reach the highest levels, through training programs and accompanying Recovery programs Technological development and modern methods that are related to different training ways and systems. As such, the research aims to know the impact of a Recovery program using an innovative device on some hormones, special strength and achievement for young weightlifters . The researchers used the experimental approach for its suitability to achieve the aims. The two testers, who were 8 weightlifters, were divided into two experimental and control groups, each of them consisted of (4 weightlifters,). With the help of an engineering cadre, the researchers design a device (with the infrared wave type), and determine the search variables for some hormones as ( T4 - T3 - Cortisol – Testosterone) and strength for ((explosive ability, power characterized by speed, endurance strength, achievement)) for weightlifting beginners. After the pre-tests, and after that the Recovery program was applied for a period of (10) weeks every week, three Recovery units, and after completion, the post-tests were conducted, and the data were collected and statistically processed through the use of the statistical package (spss). It improves some hormones, strength and achievement for young weightlifters.

**Key words:** Recovery - Recovery program - hormones - special strength – achievement

### i. Introduction and Significance of the study:

Weightlifting is one of the important activities that require a high physical and skill level by the players to be ready for competition. Thus, further improvement of the physical level of the weightlifting players is a result of increasing the efficiency of the work of functional devices, and this does not come through training only, but through its synchronization with the increase in speed to compensate for energy spent in these exercises .This is related to the nature of the training used by increasing the load, which makes there a great burden on the player by increasing the number of training units per day or during the training week, which lasts for long hours, and causes fatigue. To overcome training loads and improve their level , players follow some methods and means of Recovery are used to accelerate the Recovery of the body's functional organs and bring them to their normal state to continue the training process in a better way. Among these, the trainers must prepare training curricula that provide appropriate Recovery means that speed up the Recovery processes and choose the appropriate Recovery means to compensate for the spent energy sources.

Hence the importance of research by implementing a Recovery program using an innovative device to help raise the level of players 'performance by increasing the speed of getting rid of fatigue resulting from training, especially with high weights in training and competitions, speeding up the Recovery process, and knowing the effect on some hormones, special strength and achievement for young weightlifters.

### ii. Research methodology and field procedures

#### 2-1 Research methodology:

The researchers used the experimental approach using equal groups method to find the solution of the problem.

#### 2-2- The research community and its sample :

2-2 The community of the study and its sample The two researchers identified the community of the study with the young weightlifters club players in Babel Governorate, which are (6) clubs with (30) players. Research

Thus, the research sample represented(8 ) players a percentage of (30.0%) of the original community. They were divided into an experimental group and a control group that each of them involves 4 player.

**2-3-Means, devices, and tools used in the research**

1. Personal interviews with specialists.
2. Three stopwatches.
3. 3medical balls
4. 5ml medical syringes.
5. Blood-holding tubes
6. Medical cotton and sterile materials.
7. French-made Senter fuge blood apheresis machine.
8. ELISA device, model (Eclectica), made in Germany
9. Chemicals (kit) to detect the concentrations of (T3, T4, cortisol, and testosterone)
10. A cool box to transport blood samples to the laboratory.
11. Pasteur Pipet for the purpose of extracting blood plasma and serum from tubes after separation.
12. The Rostameter to measure height and weight, US-made.
13. Lenovo computer.
14. Column of gravity, count (5) weights of different sizes.
15. The device manufactured by infrared
16. 2and field search procedures

**2-4 .Study Sample homogeneity**

After determining the measurements affecting the studied research variables, namely height, weight, time, and age of training due to their relationship to the research variables under study, homogeneity was performed using the mean, standard deviation, and Levin test among the sample members in these measurements to adjust the research variables that affect the results of the experiment. Table (1) illustrates

Table (1)

Demonstrates the homogeneity of the research sample

Factors	SD	Mean	Skewness	Levene Statistic	Type of significance	Level of error
Length	168.2	3.327	0.05	0.1	0.99	.No sig
Mass	69.00	5.345	0.456	0.41	0.54	.No sig
Training age	17.5	23.00	0.076	0.18	0.99	.No sig
Chronological age	3.25	0.517	0.644	0.63	0.35	.No sig

Table (1), shows the value of (Sig.) For all variables, which is greater than (0.05) at the degree of freedom (7). Thus the null hypothesis that states that homogeneity of differences is equal to the sample, is accepted. This means that the data are homogeneous.

**2-4-2 Determination of research variables hormones and special power**

After surveying modern scientific sources, and consulting experts and specialists at the University of Babylon, the research variables were identified from the hormones most effective in the requirements of the game as well as the special strength that the player needs in achieving this activity, as follows:

- Hormones (cortisol - testosterone - T3 - T4).
- strength related to (explosive power, maximum strength, force characterized by speed, bearing strength.
- Achievement of the two the snatch lifts and the JERK.

**2-4-3 Determining the study variables tests**

**2-4-3-1 Hormone Tests**

- Measurement of the concentration of the hormone T3, T4, cortisol, and testosterone.  
 - Method of performance: a sample of blood is taken from the player with an amount of (cc5) after the training unit and placed in a special tube to preserve the blood, then the doctor who is specialist performs the process of calculating the percentage of the T3 hormone by placing the blood with (ELISA kit) in the (ELISA) device to calculate its percentage In the blood and the mechanism of enzyme extraction through the imported kit, the method of action is the T3 hormone.

Recording: The ELISA readings of the concentration of each hormone (T3, T4, Cortzol, Testosterone) are recorded.

**2-4-3-2 Special Strength Tests**

**2-4-3-2-1 Explosive Muscle Power Tests (\*):**

1- Test the explosive ability of the muscles of the arms (throwing a medicine ball).

Tools: Medicine ball, weight (3 kg), fixed chair, tape measure, 2 fixing belt, camera, computer, drawing scale.

Method of performance: The player sits on the seat fixing the feet and the back with a belt and holds the ball and the feet are fixed on the ground with a suitable hole and the back straight, and then throws the ball to the maximum height and the camera is placed to the side to record a video of the full range of movement of the ball.

Scoring method: The player is given three attempts and the best attempt is taken. (Abdul Karim, 2007, p. 55)

**2-4-3-2-1-2 Test the explosive ability of the leg muscles (modified Sergeant's test):**

Necessary tools: smooth wall, camera, computer.

Method of performance: The player stands facing the wall and a white mark is fixed in the belt area in the middle of the body, provided that the player's clothes are dark so that the mark is clear and the camera is placed behind the player at a suitable distance so that the movement is fully visible and the feet appear when leaving the ground as well as the hands appear at their highest height, The scale is positioned at the same jump point as the tester and the jump is depicted with maximum stability.

Scoring method: The distance the player makes is calculated from the moment of breaking the contact with the ground to the highest point the player reaches, and the film is processed through the kinematic analysis program (Traker) to calculate the distance, speed and time:

**2-4-3-2-2 Extreme Strength Tests: -**

**2-4-3-2-2-1 Pulling the weight from bend to straightness (Diedelift test):**

- The tools used: the column of gravity (20 kg), iron bar of different weights.
- How to perform: Standing in front of the weight, bending the knees, holding the iron pillar of gravity, and carrying the weight by extending the knees straight to the knees with maximum strength for one time.
- Scoring method: The player is given three attempts and the best attempt is taken.

**2-4-3-2-2-2 A test of the maximum strength of the two legs (rear-shaped).**

Tools: regular iron bar weighing (20) kg, iron discs of different weights, bearers.

- How to perform: Place the column of gravity on the shoulders and is based on the neck and shoulders, and hold the column of gravity with the breadth of the shoulders while maintaining a straight back position.
- Scoring method: The player can perform three attempts and the best attempt is taken. (Allawi, Radwan, 2011, p. 51)

**2-4-3-2-2-3 Test the maximum strength of the arms (back pressure)**

- Tools: a regular iron bar weighing (20) kg, iron discs of different weights, bearers linked to a fixed seat).
- How to perform - from the position of sitting on the seat, grabbing the column of gravity while it is on the rack, then lifting it up behind the head, then bending and extending the arms upwards with maximum force for one time.
- Scoring method: - Three attempts are given and the best attempt is scored. (Abu Al-Ela Ahmed, 2003,p318)

**2-4-3-2-3 Characteristic strength tests with speed: -**

**2-4-3-2-3-1 The deadlift test to measure the force characteristic of speed of the core muscles:**

- Tools used: a column of gravity (20 kg), steel discs of different weights, a stopwatch.
- How to perform: Standing in front of the weight, bending the knees, holding and carrying the iron pillar of gravity, and then extending the knees straight to the knees completely and repeating the performance until the time ends at maximum speed, with a weight of 65% of the player's ability.
- Recording method: counting the number of iterations during (10 seconds). (Laila El-Sayed Farhat: 2018, p. 194)

**2-4-3-2-3-2 The posterior dorsi test to measure the force characteristic of velocity of the leg muscles:**

- Devices and tools: iron bar weighing (20) kg, iron discs of different weights, bearers, stopwatch).
- Method of performance: The player carries the column of gravity on the shoulders and is based on the neck and shoulders, and holds the column of gravity with the breadth of the shoulders while maintaining a straight back position. 65% of the ability of the player.
- Recording: Calculating the number of iterations during a period of time (10 seconds). (Mr. Abdel Maqsood, 2015,p186)

**2-4-3-2-3-3- Test: back pressure to measure force characteristic of velocity**

Equipment: a regular iron bar weighing (20) kg, iron discs of different weights, bearers linked to a fixed seat, a stopwatch.

- Method of performance - the player stands from a sitting position on the seat and holds the column of gravity while he is on the rack, then raises up behind the head, then bends and extends the arms upward in one straightness and repeats the performance until the time is up at the maximum possible speed and with a weight of 65% of the player's ability.

- Recording method: - Counting the number of iterations during a period of time (10 seconds). (Allawi and Radwan: The previous source, 2011, p.57)

**2-4-3-2-4 Strength Tests:**

**2-4-3-2-4-1- Core muscle strength endurance test (deadlift test): -**

- Tools used: (weight column (20 kg), steel discs of different weights, stopwatch).
- Method of performance The player stands in front of the weight, bending the knees, holding the iron bar, carrying the weight, and then extending the knees straight to the knees and repeating the performance until the time ends at the maximum speed, and the weight is strongly determined 45%.
- Recording method: Count the number of iterations within (30) seconds. (Sabah Abdi: 2002,p76)

**2-4-3-2-4-2- The strength test of the two rear legs:**

- Devices and tools: (regular iron bar weighing (20) kg, iron discs of different weights, bearers, stopwatch).
- Method of performance: placing the column of gravity on the shoulders and resting on the neck and shoulders and holding the column of gravity with the breadth of the shoulders while maintaining a straight back position. %.

Recording: Counting the number of iterations for 30 seconds (Ubied, 2016, p77)

**2-4-3-2-4-3- Arm strength test (back pressure)**

- Tools: a regular iron bar weighing (20) kg, iron discs of different weights, bearers linked to a fixed seat, a stopwatch).
- Method of performance: From sitting on the seat, holding the weight of the column while on the carrier, then lifting it up behind the head, then bending and extending the arms up and repeating the performance until the time ends at the maximum speed, and the weight is strongly determined by 45%.
- Recording method: - Counting the number of iterations (within 30 seconds). (Bastwissi Ahmed: 2011,p249).

**2-4-3-3 Achievement Test**

Performing the snatch and JERK lifts according to the legal steps stipulated by the International Weightlifting Federation.

The player's two best attempts are summed and then divided by the player's weight to find relative achievement

**2.4-4 Pre-tests**

The pre-tests for the search variables were conducted on Monday 7/8/2019 at four in the afternoon in the sports hall of the Medhatia Club.

**3-4-5- Equivalence of the research sample to the studied research variables:**

In order to reduce the error in the results resulting from the influence of the research variables, the two researchers conducted parity for two control and experimental groups in hormones (T3, T4, Cortzol, Testosterone) and special strength variables (explosive power of the arms and legs, the relative maximum strength of the arms, torso and legs, the characteristic force of speed for the arms, trunk and legs. , Strength endurance of arms, torso and legs, achievement (through the results of the pre-tests through the T. test)) for independent samples as shown in Table (2).

Table (2)  
Equivalence of the research sample to the variables of the studied research

unit of measurement variables		Pretest		Post test		T-test value	Level of error	Type of significance	
		Mean	SD	Mean	SD				
Hormones	T4	81.987	1,09	82.385	1,62	16.64	0.803	.No sig	
	T3	10.7.856	0,053	10.795	0,876	4.87	0.612	.No sig	
	cortisol	371.296	2,119	371.76	1,421	10.27	0.907	.No sig	
	testosterone	396.141	15.73	396.54	17.957	16.64	0.653	.No sig	
al Str en	Explosive power	Arms	11.53	0.117	11.23	0.957	0.444	0.673	.No sig
		legs	29.2	0.066	28.47	0.816	0.444	0.673	.No sig

	, maximum strength,	Arms	8.01	0.79	7,997	0.86	0.631	0.552	.No sig
		trunk	4.182	0.25	4.2	0.577	0.631	0.882	.No sig
		legs	4,347	0.69	4,417	0.816	1,550	0.935	.No sig
	strength characteristic by speed,	Arms	8.25	3.18	9	0.957	1,550	0.784	.No sig
		trunk	8	0.222	8	0.86	0.085	0.868	.No sig
		legs	8	0.192	8.75	0.957	0.085	0.391	.No sig
	Strength of endurance	Arms	19	0.095	18.25	1	0.287	0.182	.No sig
		trunk	18.5	0.076	17	1.414	0.287	0.638	.No sig
		legs	18.25	0.574	18.5	1.29	0.173	0.391	.No sig
Achievement		1.02	0.566	1,07	1.25	0.173	0.215	.No sig	

From Table (2) it can be seen that the value of (sig) for all research variables is greater than (0.05) and therefore we accept the null hypothesis that says that there is no difference between the scores of the control group and the experimental group and that the differences are not significant, which indicates the parity of the two research groups.

**3-4-6- Application of the Recovery program**

1. The Recovery program started on Tuesday 9/7/2019 and ended on Saturday 9/21/2019.
2. The Recovery program lasted for (10) weeks
3. The number of Recovery units per week is three
4. The total Recovery units in the program are 30 units.
5. Average Recovery time per week (8-18 minutes)
6. Average time per Recovery unit (6-16 minutes).
7. Determine the time of the Recovery unit according to the intensity of the training unit, which ranged from (65% -100%).
8. The program was implemented immediately after the completion of the training modules.
9. The Recovery program continued even near competitions.

**3-4-7- Dimensional tests:**

The two researchers conducted post tests on Sunday 9/22/2019. After completing the Recovery program on the experimental group and the control group after completing their program with their trainer for some hormones, special strength and achievement for weightlifting youth.

**iii. Results Presentation and discussion**

**3-1 Presentation of the pre and post test results of the studied research variables for the experimental group**

Table (3)  
pre and post test results for some hormones for the experimental group

unit of measurement variables		Pretest		Post test		T-test value	Level of error	Type significance	
		Mean	SD	Mean	SD				
Hormones	T4	96.85	1,09	116.03	2.54	16.64	0.0082	sig	
	T3	20.009	0,053	24.175	0.023	4.87	0.0034	sig	
	cortisol	35.62	2,119	41.763	0.953	10.27	0.004	sig	
	testosterone	396.076	15.73	430.01	7.252	16.64	0.007	sig	
Special Strength	Explosive power	Arms	11.53	0.79	13.1	1.587	4.214	0.024	sig
		legs	29.2	0.69	33.63	1.489	7.571	0.005	sig
	, maximum strength,	Arms	7.99	0.22	9.95	2.463	6.62	0.007	sig
		trunk	4.182	0.095	8.61	0.344	23.04	0.008	sig
		legs	4.347	0.574	4.955	0.365	5.87	0.0097	sig
	strength characteristic by speed,	Arms	8.25	0.5	10.25	1.445	4.899	0.016	sig
		trunk	8	0.716	10.75	1.393	11.08	0.002	sig
		legs	8	0.816	10.95	0.397	8.66	0.003	sig
	Strength of endurance	Arms	19	0.916	22.01	1.345	8.66	0.0092	sig
		trunk	18.5	2.97	21.75	0.514	9.8	0.006	sig
		legs	18.5	1.29	20.05	1.587	7.87	0.003	sig

Achievement	1.12	0.566	1.42	0.117	10.15	0.002	sig
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Through Table No. (3) we note that the statistical indicators of the results of the pre and post measurements of the experimental group of all the studied variables indicated that there are statistically significant differences between the pre and post measurements that the value of (sig) was less than the level of significance (0.05), and thus we accept the alternative hypothesis that states that there are statistically significant differences between the pre and post tests and in favor of the post tests.

**3-2 Presentation of the pre and post test results of the studied research variables for the control group**

Table (4)

pre and post test results for some hormones for the control group

unit of measurement variables		Pretest		Post test		T-test value	Level of error	Type significance of	
		Mean	SD	Mean	SD				
Hormones	T4	87.36	2.164	106.63	1.62	19.500	0.0082	sig	
	T3	20.932	0.121	22.475	0.876	5.960	0.0034	sig	
	cortisol	36.68	4.92	39,421	1,421	10.480	0.004	sig	
	testosterone	397.012	67.36	427.882	17.957	18.890	0.007	sig	
Special Strength	Explosive power	Arms	11.23	0.25	13.1	0.58	8.46	0.003	sig
		legs	28.47	3.18	31.85	0.68	10.25	0.002	sig
	, maximum strength,	Arms	8.01	0.192	9.177	0.427	7.739	0.004	sig
		trunk	4.2	0.761	7.61	0.101	5.934	0.013	sig
		legs	4.417	0.566	4.655	0.661	5.143	0.014	sig
	strength characteristic by speed,	Arms	9.00	0.816	10.25	0.88	8.66	0.003	sig
		trunk	8.00	7.5	10.75	0.957	3.806	0.032	sig
		legs	8.75	0.957	10.5	0.63	13.00	0.001	sig
	Strength of endurance	Arms	18.25	0.957	21.5	0.95	7.3	0.006	sig
		trunk	17	1.414	20.75	1.25	11.8	0.002	sig
		legs	18.25	1.25	20.75	1.5	9.53	0.003	sig
	Achievement		1,07	0.118	1.18	0.02	7.739	0.004	sig

Through Table No. (4) we note that the statistical indicators of the results of the pre and post measurements of the control group for all the studied variables indicated the existence of statistically significant differences between the pre and post measurements that the value of (sig) was less than the level of significance (0.05), and thus we accept the alternative hypothesis that It states that there are statistically significant differences between the pre and post tests for the experimental group and in favor of the post tests.

**3-3 Results of dimensional tests of research variables for the experimental and control group**

Table (5)

the results of the dimensional tests of the search variables for the experimental and control group

unit of measurement variables		Experimental group		control group		T-test value	Level of error	Type significance of
		Mean	SD	Mean	SD			
Hormones	T4	116.03	2.54	106.63	1.62	19.50	0.0082	sig
	T3	24.175	0.023	22.475	0.876	5.960	0.0034	sig
	cortisol	41.763	0.953	39,421	1,421	10.48	0.004	sig
	testosterone	430.01	7.252	427.882	17.957	18.89	0.007	sig
Explosive	Arms	13.1	0.58	13.1	0.58	8.46	0.003	sig

	<b>power</b>	legs	31.85	0.68	30.85	0.68	<b>10.25</b>	<b>0.002</b>	sig	
	<b>, maximum strength,</b>	Arms	9.177	0.427	9.177	0.427	<b>7.739</b>	<b>0.004</b>	sig	
		trunk	7.61	0.101	7.61	0.101	<b>5.934</b>	<b>0.013</b>	sig	
		legs	4.655	0.661	4.655	0.661	<b>5.143</b>	<b>0.014</b>	sig	
	<b>strength characteristic by speed,</b>	Arms	10.25	0.88	10.25	0.88	<b>8.66</b>	<b>0.003</b>	sig	
		trunk	10.75	0.957	10.75	0.957	<b>3.806</b>	<b>0.032</b>	sig	
		legs	10.5	0.63	10.5	0.63	<b>13.00</b>	<b>0.001</b>	sig	
	<b>Strength of endurance</b>	Arms	21.5	0.95	21.5	0.95	<b>7.3</b>	<b>0.006</b>	sig	
		trunk	20.75	1.25	20.75	1.25	<b>11.8</b>	<b>0.002</b>	sig	
		legs	20.75	0.58	20.75	1.5	<b>9.53</b>	<b>0.003</b>	sig	
	<b>Achievement</b>			1.42	0.117	<b>1.18</b>	0.02	<b>3.806</b>	<b>0.032</b>	sig

Table (5) we note that the statistical indicators for the results of the dimensional tests for all the research variables studied and for the experimental and control groups showed that there are statistically significant differences between the dimensional measurements in favor of the experimental group. What confirms this is the value of (sig) shown in Table (5) for all variables Where the research was less than the significance level (0.05), we accept the alternative hypothesis that states that there are statistically significant differences between the scores of the telemetry and the experimental group in favor of the telemetry.

Discussing the results of the pre and post tests for the experimental group and the control group:

The results in Table (3) (4) indicated that there are significant differences between the results of the pre and post tests for the experimental group for all variables and in favor of the post tests for the members of this group, and the reason for the appearance of the results is shown in this way as follows:

- The results indicated that there are significant differences between the pre and post test for the experimental group and in favor of the post test. The researchers attribute that improvement in the Recovery program according to the innovative device that helped increase the adequacy of the physiological muscles and restore their activity and the activity of the nervous system, and the improvement in the effectiveness of neural instructions, which leads to impeding access Nerve signals and their failure to reach inside the muscle fibers smoothly, and this reduces the possibility of rapid contraction and relaxation of the muscles, and then the level drops (Howard G. Knuttgen & other; 2003, p: 60). Thus, the Recovery program helped in reducing some of the body's internal reactions that are affected by the training pregnancy and getting ready for the next training unit, and Recovery is the functional state that the individual goes through after physical work and until returning to a normal state. "He confirms (Al-Saadawi, 2009): Healing is the critical and important factor that allows for high performance, training is determined by a mixture of excitement and healing (Al-Saadawi, 2009,p76).

It is also worth noting that determining the length of Recovery periods was consistent with the size of the effort, the loads and training stresses, which allow as much as possible to complete the healing process, in addition to that it was derived from the fatigue of the players themselves after direct access by the researchers to what the players train in their daily units and follow Measure in that so that Recovery is appropriate or appropriate to the intensity of the training load, which is one of the types of rapid Recovery that occurs at the end of the training unit and states (Ibrahim, 2008) that one of the most effective ways to achieve such goals is to use different healing Recovery methods. (Ibrahim ,2008, p131).

In addition, it is worth noting that the Recovery program used has shown its effectiveness in the Recovery processes, the balance of vital energy and the rebuilding of energy sources in a shorter period of time, which was characterized by the rebalancing of the building processes in the metabolism as this led to an increase in the breakdown of creatine phosphate for energy production. According to what was mentioned (Al-Bishtawi, 2010, p. 246). The physical fitness of an athlete is different from one person to another. The higher the individual's physical fitness, the shorter the time period for the return of normal enzyme activity, and the lower the physical fitness, the shorter the time period.

As for the control group, and through what is mentioned in Table (5), it has been proved that there are differences between the pre and post tests and in favor of the post test, and the researcher attributes that to the development to the players 'commitment and continuity in the performance of training units, as well as the training curriculum presented by the trainer which helped to show these differences In addition to the competition between the two groups, and despite this development of the control group, the development was less than the experimental group and all the research variables studied and the table (5). The researchers attribute that as follows:

- Hormonal (T3, T4): The researchers attribute the results of these results to the fact that the Recovery program with infrared rays led to a rise in temperatures and an increase in neurological reflexes and associated devices, accompanied by sweating, and this leads to a greater blood flow that will lead to direct stimulation of the heart

and thyroid gland, which It is a catalyst for the production of thyroxine, as the high blood flow leads to the activity of this gland, and this is confirmed by (Narrator and Solomon, 2008) that the increased activity of the thyroid gland will lead to an increase in the activity and efficacy of the rest of the body's systems, the exchange of thyroid secretions and their stimulation by the body's systems and stimulation Thyroid parts of the body and the accompanying activity of all cells of the body, since the thyroid gland is responsible for the metabolism in cells (Al-Rawi, Solomon: 2008, p.25)

With regard to the hormone cortisol, the researchers attribute the results to that the Recovery program developed with the training curriculum according to scientific foundations and the legalization of periods of rest and Recoveryization has worked to increase the level of concentration of the hormone cortisol as (cortisol rises with the severity of pregnancy and that the increase in its level in the blood occurs with pregnancy. High intensity only ( Al Kaabi: 2007) and a study (2016. Loturco), which used clothing that generates infrared rays for soccer players, is able to increase blood circulation, relieve stress and stimulate hormones to work according to performance requirements (Loturco. 2016; 33). (Karu 2010) confirmed that the use of infrared radiation works to analyze free radicals into simple caused by (IRA) from antioxidants such as carotenoids to different degrees, as a result of penetration into the surface layer of the skin, stimulating metabolic activity and thus increasing the activity of the thyroid gland (Karu T.I. 2010, p62)

As for the testosterone hormone: the researchers attribute these differences as a result of the Recovery program that contributed to increasing the renewal of protein and amino acid stores inside the cells and thus contributed to the increase in the percentage of growth hormone (the growth hormone secretes directly the transfer of some amino acids through the cell membranes into the cell and increases the concentration Amino acids in cells and are partly responsible for protein synthesis ((Guyton and Hall, 2017, p. 123), as is consistent with what he indicated (Australian, 1994) (the hormone actively contributes to protein accumulation) (Australian, 1994. p43)). Therefore, the innovative infrared device has contributed to increasing the production of (ATP) inside the cell by increasing the interaction of metabolites. The data he collected (Santana-Blank LA, 2008) during his study of infrared radiation indicated that it leads to enhancing cell viability and stimulating Growth factors in it (Santana-Blank LA, et al. 2002; p8.).

With regard to the special strength variables and achievement: the results indicated that there are significant differences between the pre and post tests and in favor of the post test. The researchers attribute that improvement in the Recovery program according to the innovative device that worked to reduce the load and stress in the nervous and muscular systems as a result of the intensity of their daily training, which worked on Events of physiological adaptations that increased their ability and made it easier for them to receive information on how to implement it on the one hand, and to restore the ability of the body's systems to perform them as required without decreasing the level on the other hand. (Al-Ali and Fathi, 2008) believes that "Recoveryization after physical effort for the purpose of reducing the amount and intensity of lactic The accumulated muscle that works to reduce fatigue (Al-Ali, Fathi; 2008, p. 188).

In addition, the indirect effect on the rest of the physiological variables helped the emergence of these results, as the increase in the speed of renewal of energy stores needed for performance and thus contributed to the increase in the manufacture of protein and amino acids inside cells and thus contributed to an increase in the percentage of growth hormone (the growth hormone is secreted in the form Direct transfer of some amino acids through cell membranes into the cell and increases the concentration of amino acids in cells and is partly responsible for protein synthesis (Risan: 2012, p65).

It should be noted that physical development is the basis for the development and adaptation of the functional apparatus and that the results of Table (5) indicated an improvement in the proportions of hormone secretion in general for the player and thus this was reflected in the player's special strength.

#### **iv. Conclusions and recommendations**

##### **4-1-Conclusions:**

1. The Recovery program using the innovative infrared device used by the experimental group has a positive effect on improving hormones (T4-T3-cortisol-testosterone).
2. The Recovery program using the innovative infrared device used by the experimental group has a positive effect on improving the special strength (explosive capacity of the arms and legs, the maximum relative strength of the arms, trunk and legs, the characteristic strength of the velocity of the arms, trunk and legs, the strength endurance of the muscles of the arms, trunk and legs) and achievement in terms of For post-tests compared to pre-tests for weightlifting teenagers.
3. The Recovery program using the innovative infrared device has the advantage of a positive effect compared to the control group in improving hormones (T4-T3-cortisol-testosterone) among the budding weightlifters.



4. The Recovery program using an innovative infrared device has the advantage of a positive effect compared to the control group in improving special strength (explosive power, maximum strength, speed characteristic force, and strength endurance) and achievement for weightlifting beginners.

**3-2 Recommendations:**

The researchers recommend the following:

1. The necessity of using the two Recovery equipment, as they are an innovative and highly effective means of healing for the players.
2. The use of the two Recovery programs after the training modules for their importance in speeding up physical Recovery
3. Attention to Recoveryization in all its stages and the need to use advanced means and technology to achieve the necessary Recoveryization for players.
4. Work on developing the device and using it in other stages of Recovery.

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