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The effect of regulating stimuli of different weightlifting using (Fit Light) technique on some indicators of electrical activity of working muscles of young lifters

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Abstract
The research aimed to prepare exercises by organizing different lifting instructions for young weightlifters using (Fit Light) technique, and to identify the effect of these exercises on some indicators of electrical activity of the working muscles for them, so the researcher assumes that there are statistically significant differences between the results of the (EMG) signal strength tests. The tribal and remote arms of the experimental and control groups, and there are statistically significant differences between the results of the experimental and post-control groups for the EMG tests for arm strength of the 16 players, all of them were chosen by a comprehensive inventory method of (100 %), and the device. was adopted (EMG) American-made Messenger (Bluetooth) It has four sensors to measure both the top and the area of the electrical signal for the muscles working in the arms when performing the lifts. The researcher designed the (Fit Light) optical technology from a group of LEDs in different colors and varying levels of illumination, operated by remote control technology, extinguished and glowed by the trainer's control over it for the purposes of Counting the repetitions of weight training and at the same time working to alert and activate the trainee, and the experiment continued for (8) consecutive weeks at a rate of (3) units per week during the period of special preparation. Fit Light) has a positive effect in increasing the peak of electrical activity (EMG), and reducing its area for working muscles in young lifters who train with it along with his training, and it is necessary to develop the capabilities of weight trainers and increase their experience in how to prepare and design (Fit Light) technology Because of its positive role in increasing the efficiency of electrical activity (EMG), and it must be taken into account not to exaggerate the type, level and color of lighting when applying the exercises using the (Fit Light) technique.

Keywords: Technology (Fit Light), electrical activity indicators, weightlifters

Introduction
Maintaining a high level of dynamic movements related to the output of muscle power requires that the weightlifter maintain the level of the neuromuscular electrical indicators of the contractions of this force in training and competition, as the matter cannot be limited or limited to the laws of conservation of vital energy that target biological metabolic processes in order to compensate for the lost Including high-intensity exercises that aim to exceed the threshold of achievement, and this calls for attention to the proper regulation of nerve impulses and their timing when training the muscles working in the repetition of movements for exercises of various lifts. All of them, and in this way, it is possible to activate these nerve impulses by means of training that achieve more than one purpose in one work, and then to reach these raisers to the levels of international problems that are an endeavor for every coach and player by challenging them or overcoming the phenomenon of physical stress that results due to the amount of weights in Continuous training loads for weightlifters, as " No stress, whatever its sources, will lead to fatigue." receptors and senses associated with the nervous system and that, mediated by stress, negative effects occur in the activity of the central nervous system. (Adel, 2009) [4] and that "the sense of sight is of special importance in education and training, through which the motor ability develops and the correct understanding of the skill performance sequence, as the eye is the one that receives energy and transforms it into physiological and neurological manifestations." (Adel, 2004) [2] And "the auxiliary training tools enable both the player and the coach to reduce many of the efforts made in learning and training, provided that they are appropriate for the game or the specialized event, and that they are appropriate for the age of the players and their training age.

"(Duane, 2007) [7] also that "when the body responds to external stimuli, complex chemical reactions and simple electrical charges occur, which move rapidly in the nerve fibers (Axons), then another neural message is followed by another stimulus, and so on, millions and millions of these Electrical nerve impulses, fired every second during The conscious and unconscious life of man, directed from and to the brain, muscles, and glands." (Wilmore and Costill, 2007 [22] and "in the succession of the exercise the relationship between the brain and the muscles is strengthened, and repetition helps." on neglecting external stimuli. The performance of the movement, and this succession serves to submit the body to a change in the improvement of strength. Nor mathematical skill, after all. " (Lee & Brenda, 2007) [10] From this digression, the need to address training problems leads to the direction of finding a link between stimulation and its means with the nature of the physiological work of neuromuscular control, as "brain activation will increase the required perceptions of the neurological impulses issued, especially the player's visual perception and help To prepare his mind to accept or mobilize information, store and retrieve it to allow or help the appearance of the required response, and this activation depends on the type and strength of the stimulus or tranquilizer that the player receives, and this activation can occur whether it is forced or by the desire of the player himself, but it is not possible to activate the brain Forcibly and obtaining desired responses, and the organizer of the training environment must create the conditions for activation by avoiding coercion, whatever the type of stimulatory means affecting the receptors of that activation. (Nazer, 2010), and accordingly, the influence on the physiology of the strength of this contraction from external sources must be directed towards the merits of the mechanism of neuromuscular work for weightlifters and the nature of the movements in their exercises with repetitive or single muscle contraction in these exercises, "and here no The trainer must realize that technology is a friendly tool for him and not a substitute for him, and that it is complementary to what he prepares as educational media and learning resources to provide a fruitful and effective learning environment. Training. " (William, 2010) [21] Thus, the mechanism of (Fit Light) technology in training does not present restrictions on the training load as much as it acts as a stimulus that raises attention and focus in games that require mastery of performance, that is, it is directed towards visual perception, and when it permeates the stimuli of repetition of muscle contractions. The purpose of its use is as a warning stimulus against the decrease in the mechanical energy of lifting weights to stimulate lifters to strengthen the nervous impulses and raise their level to reduce the decrease, An active process that includes multiple activities (such as attention - sensation - awareness - memory), as it confirms that attention is a key to awareness," (Ahmed, 2002) [5] as the signals that enhance the brain's work are divided into three types according to their intensity, as follows "sub threshold signals." Minimum: These are the signals whose intensity is less than the minimum threshold, and therefore do not cause excitation or response later, except in cases of combination without distance and time, and minimum -threshold signals: These are signals whose intensity has reached the minimum threshold A And the lower limit of the intensity, and thus cause excitation and no response later, and signals above the minimum threshold: These are the signals whose intensity is higher than the minimum threshold, and which do not can her It does not cause excitation in the event that the nervous tissue is in a state of excitement." (Mohamed, 2002) and weight training, no matter how different the weights of the players, but it recedes mostly in muscle strength training, which is defined as "the ability to overcome external resistance." Or confronting it, as it is defined as the maximum amount of force a muscle can perform in one maximum muscle contraction, and there are three types of muscle strength, represented by maximum strength, speed characterized by speed, and endurance of force." (Ahmed, 2019) [6] and sports training leads to different physiological changes It includes all the vital organs of the body and these changes occur at the level of cells and tissues as well, and given the breadth and depth of dealing with sports physiology in recent years, researchers have been able to obtain important physiological information and facts that contributed to the development of sports training, (Omar, 2018) [14] as "motor performance in sports activities requires a high degree of motor coordination, meaning the ability to show appropriate motor actions in certain circumstances based on previous motor experiences or mastered skills, in other words the ability of the athlete to act in the face of different conditions. During performance. (Abu Ela, 2005). And since the brain is the interpreter of the information received from the senses, especially the sight, which is the subject of research, and it is in control of the training and motor learning processes and is physiologically affected by the light that affects the vision and alertness of the athlete, and since the source of the movements is the physical abilities that the muscles produce, it is possible to work on regulating these Indications and striving to maintain the strength of its level in influencing the working muscles, hence the importance of this research in integrating the physical effects and physical exercises accompanying lighting with (Fit Light) technology to guide them towards controlling the timings of repetitions on the one hand by counting the number of times the lighting controls it On the one hand, and to alert the weightlifter and activate the inactivity of the brain that they face in repetitions, and by virtue of the work of the academic and training researcher, he noticed the lack of interest in nervous stimulation by investing the sense of sight to influence the activation of players who suffer from stress, especially at the end of the training units they receive during the special preparation period. With this research, the aim of this research is to prepare exercises by organizing different lifting instructions for young weightlifters using (Fit Light) technique, and to identify the effect of these exercises on some indicators of electrical activity of the working muscles they have, so the researcher assumes that there are statistically significant differences between the results of (EMG) signal tests. For the strength of the tribal and remote arms of the experimental and control groups, and there are statistically significant differences between the results of the experimental and post-control groups of the EMG test for the strength of the arms.

Methods

Research Methodology: In order to find a solution to the existing problem The researcher adopted the experimental research method, which is defined as "a type of research in which the researcher controls one or more variables to bring about a deliberate and controlled change to the specified

conditions and explains the results of this change. ” (Adel, 2016) [3] The experimental design with two groups, the experimental and the control, was also adopted the exact equivalent in the pre and post tests.

Research community and sample: The research community is represented by young weightlifters affiliated with the Iraqi national team participating in the sports competitions (2021) who are officially registered within the youth category in the Iraqi Central Weightlifting Federation of medium weight (16) players, all of whom were chosen by a comprehensive inventory method by (100 %) from Their population, then they were randomly divided into two experimental and control groups of equal number.

Measurement, tests and procedures: A device approved to measure the electrical strength of the arms (EMG) American-made Messenger (Bluetooth) It has four tongs located in each of the biceps brachii muscles, and the radial flexor muscles of the forearm of the muscles of the right and left arms to obtain the results of the (EMG) signal, which is analyzed by a program (Myo Research XP 1.06.67) Inventory with a portable calculator in order to read both the peak and area of the electrical signal after synchronization between a digital camera type (SONY) At a speed of (100 images. Second) when the laboratory performs the Olympic lift at its maximum achievement in the middle weight, and this test does not count its results in the research, but for the purposes of synchronization when producing the explosive force of the two arms, as the researcher designed the (Fit Light) optical technology from a group LEDs in different colors and different levels of lighting, operate by remote control technology, extinguish and glow under the control of the trainer for the purposes of counting the repetitions of weight training and at the same time working to alert the trainee and activate him through lighting the availability of the elements of suspense and excitement, and thus the goal of this technique is stimulating or stimulating awareness And the awakening of the brain during the exercises, to later affect both the peak and the area of the electrical signal (EMG) To express the efficiency or fatigue of the muscles during training, and the difference here from the control group that receives the same exercises is the experimentation mediated by the independent factor represented by (Fit Light) technique In front of the experimental group trainees and their control, the experiment lasted (8) consecutive weeks at a rate of (3) units per week during the period of special preparation for weightlifters. Of the young people, and after completing the experiment, the results of the pre and post tests were published to be treated with a system (SPSS) to extract the values of each of the percentage, mean, standard deviation, t-test for uncorrelated samples, and t-test for correlated samples.

The results and their discussion:

Table 1: shows the results of the tribal tests between the two groups in dependent variables

Measurements and tests			The experimental		The officer		Liven	(Sig)	(t)	(Sig)	indication
			s	+ p	s	+ p					
Right arm	Biceps brachii	the top	641	10,744	644.75	8.102	1.256	0.281	0.788-	0.444	Non-Indic.
		space	75.25	2.493	74.63	3.462	0.437	0.519	0.414	0.685	Non-Indic.
	Flexor of the forearm	the top	631.25	3.991	626.63	3.815	0.376	0.550	1.369	0.063	Non-indic.
		space	82	3.381	83	1.604	0.589	0.456	0.756	0.462	Non-indic.
Left arm	Biceps brachii	the top	640.63	10.501	641.88	9.326	0.09	0.768	0.252	0.805	Non-indic.
		space	74.75	2.121	74.38	3.204	0.542	0.474	0.276	0.787	Non-indic.
	flexor of the forearm	the top	627.88	6.49	625.75	4.334	1.558	0.232	0.77	0.454	Non-indic.
		space	80.88	3.603	81.5	2,619	0.629	0.441	0.397	0.697	Non-indic.

The degree of freedom n- 2 = (14), not significant if (Sig) < (0.05) at the level of significance (0.05) **.**

Table 2: It shows the results of the pre and post tests for the two groups in dependent variables

Measurements and tests			The group	Pretest		Distance test		Q	P	(t)	(Sig)	Indication
				s	+ p	s	+ p					
Right arm	Biceps brachii	The top	tj	641	10,744	760	3.381	119	10.156	33.142	0.000	Indicate
			z	644.75	8.102	703	24.974	58.25	26,386	6.244	0.000	Indicate
		Space	tj	75.25	2.493	56.13	1.959	19.125	3.137	17,245	0.000	Indicate
			z	74.63	3.462	62.75	5.23	11,875	5.357	6.27	0.000	Indicate
	Flexor of the forearm	The top	tj	631.25	3.991	727.63	4.438	96.375	6.479	42.07	0.000	Indicate
			z	626.63	3.815	686.38	18.408	59.75	19,696	8.58	0.000	Indicate
		Space	tj	82	3.381	70	1.604	12	3.703	9.165	0.000	Indicate
			z	83	1.604	76.25	3.845	6.75	3.151	6.059	0.001	Indcate
Left arm	Biceps brachii	The top	tj	640.63	10.501	828	3.854	187.375	13,783	38.45	0.000	Indicate
			z	641.88	9.326	770.75	27,551	128,875	28.16	12,944	0.000	Indicate
		Space	tj	74.75	2.121	59.75	1.982	15	3.338	12.71	0.000	Indicate
			z	74.38	3.204	66.13	3.72	8.25	4.496	5.19	0.001	Indicate
	Flexor of the forearm	The top	tj	627.88	6.49	745.88	3.314	118	7.151	46.67	0.000	Indicate
			z	625.75	4.334	687.5	26,479	61.75	27,463	6.36	0.000	Indicate
		Space	tj	80.88	3.603	73.75	2.121	7.125	4.086	4.932	0.002	Indicate
			z	81.5	2,619	79	2.563	2.5	2.976	2.376	0.049	Indicate

Significance of difference (Sig) ≥ (0.05), Degree of freedom (n)- (1) for each group, level of significance (0.05)

Table 3: shows the results of the post-tests between the two groups in dependent variable

Measurements and tests			The experimental		The officer		(t)	(sig)	Indication
			S	+ p	S	+ p			
Right arm	Biceps brachii	The top	760	3.381	703	24.974	6,397	0.000	Indicate
		Space	56.13	1.959	62.75	5.23	3.355	0.005	Indicate
	Flexor of the forearm	The top	727.63	4.438	686.38	18.408	6.162	0.000	Indicate
		Space	70	1.604	76.25	3.845	4.243	0.001	Indicate
Left arm	Biceps brachii	The top	828	3.854	770.75	27,551	5.821	0.000	Indicate
		Space	59.75	1.982	66.13	3.72	4.278	0.001	Indicate
	Flexor of the forearm	The top	745.88	3.314	687.5	26,479	6.187	0.000	Indicate
		Space	73.75	2.121	79	2.563	4.463	0.001	Indicate

The degree of freedom n- 2 = (14), not significant if (Sig) < (0.05) at the level of significance (0.05)

It is noted from the results of the pre and posttests of the electrical activity indicators of the working muscles of the young lifters in each of the two groups mentioned in Table (2) that each of the two groups improved with an increase in the peak of the electrical activity at the expense of a decrease in its area. The control group in these results over their peers in the control group, and the researcher attributes the emergence of these results to the interpretation that he gives to these two results to the lifters of the experimental group is to their application of organizing instructions for different weightlifting using (Fit Light) technique, which the researcher was keen to accompany their usual exercises, which helped alert the centers Sensation of the visual light provided by this technique and stimulating the cerebral cortex by sending nerve impulses at a better level, as well as controlling the time between rest between repetitions, which when regulated, it is possible to control the mechanisms of metabolic regulation, and thus, this training method helped the lighting in it to activate young weightlifters According to the foundations and principles of sports training with easy changes, which is instead of using the whistle or voice prompting with Levels of lighting with (Fit Light) technology and its diversity to strengthen neuromuscular stimuli, as " the most important characteristic of sports training is its connection with the theories and foundations of other sciences on which it depends mainly in forming its various knowledge and information. Thus, sports training is the outcome of that interconnected mixture of The different sciences and perhaps the reason is that this science aims to advance the development of human physical performance to achieve the highest levels of sport" (Wajdi, 2018) [19] given that "the organization of work on the central nervous system depends on the function and the system and that the structure and complexity of the system and function are compatible." Through this important device, because the function of the central nervous system is to quickly choose the appropriate response to different stimuli, whose effect is seen directly. (Owais, 2000) [15] "The nerve signal in the muscle is strengthened by the effect of exercise on the efficiency of the motor system, and it stimulates the movement centers in the cerebral cortex and inhibits the centers of emotion." (Seddik *et al*., 2012) [16] and "the rate of motor unit activation and control of arousal style is the main factor between good performance and poor performance. " (Mohammed, 2000) [12] Also, "excitation has a role in stimulating nerves, and in sum, the strength and speed of the mechanical action of the affected muscles or resulting from this stimulation requires vital energy to continue, and therefore stopping the stimulation leads to a halt in the chemical processes related to releasing the energy of these muscles." (Guyton, 2010) [9] Besides Studies have provided an explanation The concept of muscular endurance "according to Brooks and Dick 's opinion, it is the ability of muscles to resist fatigue for a long period of time, and this means, from their point of view, the individual's ability to continue making a successive effort while throwing resistance on muscle groups," (Walid, 2016) [20] " The load that is given to the player causes agitation and change in the vital organs and systems of the body from a functional and chemical point of view, and this appears in the form of improvement in the adequacy of various organs and systems; In addition to the distinction of performance by economy by effort as a result of his continued performance of the pregnancy despite the beginning of his feeling of fatigue and then his adaptation to this load. " (Emad, 2007) [8] as "The worker Joint Chief _ in a Most Offers optical and direct in a Athletic training, in that it is a nerve Offers optical as Especially, so that The majority of devices Display optical exposure Picture The light is in varied and interesting colors To alert and arouse." (Abdul-Azim, 2002) "The work aimed at creating appropriate conditions and preparing the mind that results from extreme sports performance is difficult, as the athlete becomes motivated or acquired for several reasons, some of which can be determined by the observer." (Marwan and Asad, 2005) [11] and thus it When the levels of fatigue are low, the individual will maintain the level of performance and at this level he does not suffer from any fatigue and that the individual is stimulated and active to motivate to increase the level of performance, but when the level of fatigue is moderate, this individual can n innovate _ Methods of trying to solve a problem and maintain the level of performance, or when the level of fatigue is high, the level of performance begins to decrease Wafaa, 2005 [18]."

Applications

1. Organizing the stimuli of different weightlifting techniques (Fit Light) has a positive effect on increasing the peak of electrical activity (EMG), and reducing the area of the working muscles of the young lifters who train with it, accompanied by his training m**.**
2. It is necessary to develop the capabilities of weight trainers and increase their experience in how to prepare and design the (Fit Light) technique. Because of its positive role in increasing the efficiency of electrical activity (EMG) in young lifters**.**
3. It is necessary to take into account not to exaggerate the type, level and color of lighting when applying the exercises using the (Fit Light) technique. in weight training**.**

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