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The Effect of the Adapted Physical Activity Program on some Health-Related Components of Physical Fitness for Patients with Hemiplegic Paralysis Resulted from Stroke.

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Abstract

The study aims to identify the effect of a program of adapted sports activities on some health-related physical fitness elements for patients with hemiplegic paralysis as a resulted of the blood stroke. For this purpose, we used the experimental method to design this research in two groups; one experimental and the other a control group with pre- and post-treatment on a sample of 10 patients with stroke paraplegia. Their age ranges between (45 years - 60 years), the duration of the program was (24) weeks.After collecting the results and treating them statistically, it was concluded that the modified sports activities program has a positive effect on restoring the movement competence of patients with paraplegia and shortening the period of time for recovery. The researcher recommended the use of specialists in the field of adapted physical activity to participate in the design of rehabilitation programs.

I. Introduction

Developed countries are interested in taking care of the disabled with different types of physical, psychological, sensory and mental disabilities whether that disability is a result of pathological, hereditary or congenital aspect, so it has established therapeutic clinics, social and rehabilitation institutions for them to take care of them and work to compensate some of their lost. The stroke is considered one of the most dangerous of these disabilities that can affect humans as the World Health Organization indicates That stroke is the first cause of paralysis and disability in adults and the second cause of death after heart disease and cancer, as about 20 million people per year suffer from it, of whom more than 5 million die. According to UNICEF, this is due to the existing complexity in the rapid social life that was associated with the movement of continuous industrialization, the pressures that the person is exposed to in his contemporary life, and the increase in the average life of the individual (Saleh, 1997, 145).

Neurons do not regenerate and they cannot be compensated for what is damaged. Therefore, the most that can be done for a patient with paraplegia resulting from stroke is to save the remaining cells and benefit from them by using them for optimal use with the help of physical therapy and rehabilitation, which is a message of social value and its goal is to prevent patients from withdrawing from the midst of life. Some studies, including the study of Ali Abdullah Ali Othman (2010) have concluded the importance of rehabilitation programs in maintaining the health and fitness of the handicapped individual, as health-related physical fitness has become more associated with paraplegic's patients because the majority of this group is more vulnerable to many of diseases because they live a lifestyle based on sitting and lack of movement (Othman, 2010, 14).

Furthermore, the study of Riyadh Abd al-Rahim (2001) indicates that the risks of immobility for patients with paraplegia are many, including obesity, muscle pain, joint stiffness, decreased lung volume, heart muscle inefficiency, circulatory failure and muscle weakness, so it becomes an urgent necessity for the patient with paraplegia, regardless of the degree of his disability, is under the influence of a treatment program to reduce or

completely eliminate all these risks. The exercises chosen do not need to be painful or invasive, but they must be organized so that they can reap their benefits and achieve the goal of them which is to rehabilitate the various body systems.Such as the muscular system by training healthy muscles above the level of injury as well as the rehabilitation of the nervous system to develop new sensory and nervous skills (Adel et al, 2018, , 204).

Moreover, thestudy of Howayda Al-Sheikh and Dawlah Al-Saeed Muhammad Ahmad (2016) showed that the rehabilitation programs play a distinct role in the lives of individuals with paraplegia. On the cerebral stroke because it seeks to raise the level of their physical, motor, functional, psychological, social, and mental abilities (Howaida, 2016,212). It has become recognized that the practice of exercise has a positive effect on the development of functional, motor, and physical competence for all parts of the body, and some studies,including the study of Benjamin Camon(2015),have found that specialists in adapted physical activity can assist a physiotherapist in designing rehabilitation programs and monitoring their implementation with the injured, especially in the last stages of treatment in order to achieve quality and to shorten the period, depending on the scientific foundations of rationing the intensity and volume of exercises, knowing the patient's maximum capacity, and what he can bear in terms of performance.

More importantly, the study of Helmy Ibrahim and Layla Farhat (1988) found that the standardized and continuous program can improve the condition of a patient with paralysis caused by stroke during the first 6 months and up to a year. That is to say, the muscles grow and strengthen by movement whether using weights or with body weight, where the thickness of the muscle fibers increases, and thus the section increases the physiology of the muscle increases muscle strength accordingly (Farhat, 1988, 124).Thus, it has become necessary to involve specialists in adapted physical and sports activity to help the physiotherapist in planning rehabilitation programs, caring for patients with hemiplegia resulting from stroke and to study the best ways and means that qualify them, restore them to their normal life in all areas and be with a role in life and not a burden on

society. For this reason, the researcher tries to contribute to the development of this field by knowing The Effect of the Adapted Physical Activity Program on some Health-Related Components of Physical Fitness for Patients with Hemiplegic Paralysis Resulted from Stroke. In light of the above, the question may be asked is: does the Adapted Physical Activity Program effect on some Health-Related Components of Physical Fitness for Patients with Hemiplegic Paralysis Resulted from Stroke**?**

II. Method and Materials:

2.1. Participants

The research community represents in general patients with paraplegia resulting from stroke among the men who frequent the functional rehabilitation clinic in Tiaret.The research sample was a purposive sampling. i.e., chosen in an intentional manner by the specialist doctor according to conditions including the type of stroke (obstructive) to ensure the accuracy of the data and the suitability of the proposed rehabilitation program, it consisted of (10) patients distributed as follows: 5 represents the control group and the other 5 represents the experimental one that has paraplegia on the right side. Their ages range from 50 to 60 years.

2.2. Design and Procedure:

. *Curriculum:* In proportion to the research problem and its objectives, we used the experimental method for its suitability to the nature of the study by designing two groups, one experimental and the other control with pre- and post-test.

. *Defining the variables and how to measure them.*

. *Research tools:* The research tools included the health-related physical fitness test for Winnick and Short (1999winnch & short): it measures the body composition (sum of skin folds for the two regions of the triceps, the sub-scapula is measured, and the muscle strength test (grip strength) and respiratory periodic endurance (6-minute walking test) (Kammoun, 2015, 48). In order to ensure the reliability of the health-related physical fitness test, the researcher conducted an exploratory experiment as a piloting phase on two extra individuals from same sample of the study population but not from the previously selected 10 patients. The results showed the difficulty in applying the periodic respiratory endurance test(6-minute walking test) due

to the inability of the survey sample members to complete the required walking distance and the researcher due to the absence of these individuals exercising walking for a long time. Therefore, the researcher placed chairs along the distance, as it was used in many recent studies such as the study of Al-Mishaan and others (2000) and Kamon (2015) at the same ages of individuals (Kammoun, 2015, 78).

Psychometric properties of the measuring instrument:

The researcher presented a health-related fitness component test form to (7) expert doctors in various fields including;Medical rehabilitation, measurement, evaluation, sports training, adapted physical education, physical, and occupational therapy in order to express an opinion, to ensure the suitability of the tests, and the conditions of their performance for the characteristics and abilities of the members of the study sample and its suitability for the study sample. The stability factor was calculated by applying it and re-applying it with a time difference of one week from the date of the first application to find the correlation coefficient between the first and second applications. He also extracted the indications for the stability of fitness tests related to health using the Krumbach Alpha coefficient.

(Table 1 shows the values for this point.)

Tests		The coefficient of stability between the two test applications	The coefficient of stability by the model of Krumbach Alpha
Body Composition	The thickness of the skin fold in the triceps humeral head muscle	0,94	0,86
	the thickness of the skin fold in the area under the scapula	0,95	0,85
	The total thickness of the skin folds	0,86	0,97
Grip strength		0,83	0,88
Respiratory periodic endurance (6 minutes' walk test)		0, 93	0,84

The modified sports activities program: The researcher used the scientific references specialized in medical rehabilitation and the opinions of experts in the field of medical rehabilitation and modified physical education through an expert opinion survey form about the axes and periods of the program, taking into account the different views of physiotherapists in

determining the period and duration of the session and the difference. The number of units and the number of hours among specialists. The period of application of the qualifying program was 6 months at a rate of two units per week, and the time of the daily rehabilitation unit in the program was (50-75) minutes, and the content of the program included a set of exercises for developing muscle strength for muscle groups, developing basic movements, level of balance, and walking.

Qualifying program content

months	objectives of the program
first month	the development of the reinforcement of muscular strength for the muscles of the hand and fingers - The development reinforcement of muscular strength for the muscles for the ability to bend the elbow - The development of reinforcement of muscular strength for the muscles for the ability to extend the elbow - The development of reinforcement of muscular strength for the muscles that work on the shoulder joint to lift the arm angle 90- Flexibility, agility, balance
The second month	the development of reinforcement of muscular strength for the muscles that are working to extend and bend your knees - The development of reinforcement of muscular strength for the muscles that operate on the strength of the muscles of the foot- Strengthen and rehabilitate muscles article (extender) for the thigh- rehabilitation of the muscle of the thigh front and rear - the development of muscle reinforcement of muscular strength for the muscles that are working to capture the relaxed knee - flexibility, agility, balance
third month	reinforcement of muscular strength for the muscles, which is working to raise aloft the arm aside more than 90 development - The development of the muscle strength working to keep the arm for equitable line of the body side of the situation - the reinforcement of the muscular strength that works to put side by side the arm to the line that is in the middle of the body - flexibility, agility, balance
fourth month	cardio- respiratory fitness (stationary bike)- The development of reinforcement of muscular strength for the muscles that are working on the development of muscle strength lifting the muscle groups that are working to prolong the muscle trunk side attractions reinforcement of muscular strength for the muscles that are working on the flexibility of the joints between the vertebrae work sensory nerve receptors core muscle developmentCatch retraction and rotation of the arm to the outsidethe ability to rotate the arm backward - flexibility, agility, balance
the fifth month	cardio- respiratory fitness (stationary bike) use hard muscle work (ISO metric)Development of force to muscle groups and extensor muscle Holding the cervical regionThe development of muscular strength of the muscle groups Holding and extensor shoulder strap Development receptors neural network belt shoulder Strengthening of the extensor muscles and holding the area back- Flexibility, agility, balance
VI month	cardio- respiratory fitness (stationary bike) - Activate sensory nerve receptors own muscles - the development of muscular strength of the muscle groups working to strengthen anti trunk legs muscles and muscle groups working area of the lower abdomen - The development of muscle strength flexors and trunk extensor- Lengthening the muscle side trunkThe flexibility of the joints between the vertebrae -- Flexibility, agility, balance

2.3. Statistical Analysis:

: The statistical treatment plan included the following: arithmetic averages standard deviation - tests for the significance of differences between the

averages - Pearson correlation coefficient - T Student function tests (Al-Hafiz, 1993,109).

III. Results:

Table No. (2): shows the results of the pre- and post-tests for the control sample in the health-related physical fitness tests.

The health-related physical fitness tests.		before		After		Calculated T value	The level of significance
		mean	standard deviation	mean	standard deviation		
Body Composition	the thickness of the skin fold in the triceps humeral head muscle	16,55	2,75	16,41	3,69	1,34	No sign
	the thickness of the skin fold in the area under the scapula	20,18	3,13	20,15	3,45	0,12	No sign
	The total thickness of the skin folds	36,73	5,62	36,56	6,18	0,52	No sign
Grip strength		29,28	2,51	30,41	2,90	2,44	No sign
Respiratory periodic endurance (6 minutes walk)		120,33	17,17	123,83	17,05	2,14	No sign

The value of tabular "T" at 0.05 = 2.57

Source: Through the results of table (2) for the control group, the value of "T" station calculated in the health-related physical fitness tests for the body composition variable (the thickness of the skin fold in the triceps humeralhead muscle, the thickness of the skin fold in the area under the scapula) was 0,52 and strength of the grip 2,44 and the respiratory cyclic endurance (walk 6 d) 2,14 are less than the tabular "T" 2.57, it indicates that there are no statistically significant differences between the mean of the pre and post scores.

Table No. (3): shows the results of the pre- and post-tests for the experimental sample in the health-related fitness tests.

The health-related physical fitness tests.		before		After		Calculated T value	The level of significance
		mean	standard deviation	mean	standard deviation		
Body Composition	The thickness of the skin fold in the triceps humeral head muscle	17,18	3,69	17	3,79	1,44	No sign
	The thickness of the skin fold in The area under the scapula	19,05	3,77	18,58	4,01	2	No sign
	The total thickness of the skin folds	36,23	7,20	35,58	7,52	2,04	
Grip strength		30,41	2,14	34,66	2,14	10,54	Sign
Respiratory periodic endurance (6 minutes walk)		123,83	19,50	169,3	27,87	5,79	Sign

The value of Tabular "T" at 0.05 = 2.57

Source: Through the results of table (4) of the experimental group, the value of "T", calculated in the health-related physical fitness tests: grip strength 10,54, and respiratory periodic endurance (walking / 6d) 5.79 is greater than the tabular "T" of 2.57 which indicates the existence of statistically significant differences between the mean scores of the experimental group members between the pre and post measurement in favor of the post measurement while the value of "T" Stedant calculated in the body composition variable (the thickness of the skin fold in the triceps humeral head muscle, the thickness of the skin fold in the area under the scapula (2.04) is less than the tabular "T" 2.57, indicating that there are no statistically significant differences between the mean scores of the experimental group members between the pre and post measurement.

Table No. (4) shows the comparison of the post-test results for the research sample in the health-related fitness tests;

The health-related physical fitness tests.		Control		experimental		Calculated T value	The level of significance
		mean	standard deviation	mean	standard deviation		
Body Composition	The thickness of the skin fold in the triceps humeral head muscle	16،41	2،75	17	3،79	0،29	No sign
	The thickness of the skin fold in The area under the scapula	20،15	3،13	18،58	4،01	0،72	No sign
	The total thickness of the skin folds	36،56	6،18	35،58	7،52	0،24	
Grip strength		29،91	2،51	34،66	2،14	3،49	Sign
Respiratory periodic endurance (6 minutes walk)		124	17،17	169،3	27،87	3،39	Sign

The value of Tabular "T" at 0.05 =2.22

Source: According to the results of Table (4), the value of "T" calculated in the tests of physical fitness related to health: grip strength 10.54 and periodic respiratory endurance (walking / 6 D) 5.79 is greater than the tabular "T" 2.22, which indicates the existence of statistically significant differences between the mean scores of the members of the experimental and control groups in the post-measurement in favor of the experimental group that received the qualifying program used in the study compared with the control group, while the value of "T" calculated in the variable of the composition of my body (thickness of the skin fold in the muscle of humeral triceps heads, skin fold thickness in the sub-scapula area (2,04) is less than the tabular "T" 2,22, indicating that there are no statistically significant differences between the mean scores of the experimental and control groups in the post-measurement of an anatomical variant.

IV. Discussion:

Through Table No. (4) which shows the existence of statistically significant differences in the mean scores of the experimental group between the pre and posttests in favor of the post measurement of health-related physical fitness elements (respiratory periodic endurance, muscle strength) and that there are no statistically significant differences in the body composition variable (The thickness of the skin fold in the triceps humeral heads muscle, the thickness of the skin fold in the area under the scapula). The researcher attributes the existence of the positive effect of the rehabilitation program to the scientific and standardized method adopted by him in developing the units of this program, which focused primarily on developing health-related physical fitness elements as well as to the duration of the program and the time of the unit and to the full commitment of the sample members to the instructions pertaining to the program and their willingness to practicewith all seriousness and eagerness and their great desire to know the improvement they have.

As a matter of fact, the current results are consistent with the findings of Usama Riyad (1999) and Abdullah Ali Othman 2010 that treating a patient with paralysis resulting from a stroke requires exercises to strengthen the injured muscles that lose the patient's ability to move or prevent atrophy muscles; (Othman, 2010, page 14).Hilmi Ibrahim and Laila Farhat (1988) indicate that a standardized and continuous program can improve the condition of a patient with paralysis resulting from stroke during the first 6 months and up to a year. That is to say, the muscles grow and strengthen by movement, whether using weights or with body weight. The thickness of the muscle fibers increases and thus the physiological profile of the muscle increases, so the muscle strength increases accordingly (Othman, 2010, p.14).

This study agrees with the study of Aida Hammoudi (2012), which concluded that the practice of modified sports activities contributes significantly to improve some elements of health-related physical fitness for physically handicapped children. The researcher believes that the improvement in respiratory cyclic endurance (Walking distance) for members of the experimental sample not positive for the proposed

rehabilitation program by using large muscles in the body such as the muscles of the limbs, back and abdomen, and this study agrees with the study of Mustafa Hamed Abdel Aziz Dabis 1996 that there is a close relationship between the practice of rehabilitative exercises and the patient's physical fitness in increasing the efficiency of the nervous system in motor controland thus helps to increase the patient's ability to perform exercises that help improve balance and increase the range of motion of the affected organ(Dabes, 1996, 15).

In Addition, Kamal Abdul Rahman and Muhammad Subhi Hassanein (1997) state that muscles are the source of movement in humans because they are the source of the force that causes movement, and the performance of most activities depends on them, and that individualswho have muscular strength can score a high degree. From general physical ability. (Kaddour Bay 2016).

It is also evident from the presentation of the results that there is a marked improvement, but not statistically significant for the body composition variable (thickness of the skin fold in the triceps humeral heads muscle, thickness of the skin fold in the area under the scapula) and that is due to the time period of the program which was not sufficient to cause a statistically significant change, and it is known according to Al-Hazaa and others (2001) that the process of reducing fats in the body is subject to a large extent to the equation of energy balance in the body, i.e. the balance of energy consumed (through food) with energy spent. (Al-Hazaa, 2001, page 52).

Through all this, we found that there are statistically significant differences between the pre and post-test for some elements of physical fitness related to health and in favour of the post-test of the experimental group, through Table No. (4) which shows the existence of statistically significant differences in the two post-tests between the experimental and control groups are in favor of the experimental group of health-related physical fitness elements (respiratory cyclic endurance, muscular strength) and that there are no statistically significant differences in the body

composition variable (skin fold thickness in the triceps humeral heads muscle, skin fold thickness in the sub-scapula area.

These results are also in agreement with the study of Howayda Al-Sheikh and the State of Al-Saeed Muhammad Ahmad 2016, “Hatzlroacheron” (1996), and the study of Benjamin Kamon (2015). The standardized and continuous program can improve the patient’s condition to the stage of standing and walking. The website for people with special needs (zoeeelehtiagat.com) confirmed that physical therapy accompanying exercise has a great role in treating paraplegia and that has consequences for the effect of exercise and treatment on the location of the central nervous system injury therefore the types of exercises differ in order to prevent muscle shortness, lack of range of motion, the occurrence of strokes from the extremities, or the occurrence of atrophy in the muscles with the passage of days (Howayda 2016, page 212).

Roweb and others (2012) indicates that one of the scientific foundations to reach the stage of balance and walking is the use of a comfortable position for patients in addition to voluntary and automatic control of muscle contractions and posture correction that ends with stability in exercise. The physically disabled person depends entirely on the strength of his arms in his movements and movements, whether through crutches or wheelchairs, which led to the focus of attention on muscle strength, and making muscle strength exercises the most important in the content of the proposed program because muscle strength has a major role in most movement performance, as some tools were used in the program, such as sandbags - medical balls - light weights, and through all this,, we found that there are statistically significant differences between the experimental and control groups in the post-measurement of some health-related physical fitness elements in favor of the experimental group.

V. Conclusion:

The primary goal of rehabilitation is to develop and develop the capabilities of the affected person to overcome the negative effects left by disability and disability from the effects of movement, psychological or social. Dealing with paraplegics resulting from stroke requires a multidisciplinary approach through a team that includes specialists in medical rehabilitation, massage, activity Physical and sports adapted and psychologists to deal with the needs of this group, as early intervention is of great importance to the degree of improvement, and we have also reached

the degree of the contribution of adapted physical and sports activity to the rehabilitation of this group physically. And follow-up on its implementation with the injured, especially in the last stages of treatment, because they are aware of the side

Especially in the last stages of treatment due to their awareness of the psychological aspect. The researcher recommends that the rehabilitation centers should seek the help of specialists in the field of adapted physical activity to participate in the design of rehabilitation programs. In the end, we hope that our study will be followed by other studies that include the psychological aspect of stroke patients with paraplegia, so that they can perform the basic functions to practice their normal life.

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