The Effect of Water Rehabilitation Program on Some Biochemical Variables, Sensory Receptors, the Strength and Speed of Neural Signal for Patients with Paraplegia

[2]Dr. Abdel Rahman Mansour Abdel-Jaber

Introduction and research problem

Recently, the use of water for therapeutic purposes has spread according to scientific foundations developed through many researches and studies to achieve the goals of hydrotherapy. The physiological effects of therapeutic water exercises are related to water temperature during the training period as well as the type and intensity of exercise used. : 37 ° C and therapeutic session period of 5: 45 minutes according to the patient's condition and age.

Water training is a comprehensive multi-faceted physical training and has recently been adopted by many trainers because it is very low and benefits athletes and especially those with high value training for speed, strength and power. Because the strongest and fastest movements in water are matched by larger resistors (1 : 64) (2005) that water exercises are important in the treatment of small injuries and the speed of healing operations and achieve preventive fitness as well as reduce the pressure on the body resulting from the exercise of competitive or friendly exercise and achieve physical fitness overall fitness of the body, and the benefits of gaining strength , Increased motor range of joints, anaerobic aerobic endurance, muscle balance, agility, weight loss, improved body function (9: 64.)

Awareness of the benefits of hydrotherapy training has grown and is now one of the latest methods. Water-center exercises are used as preventive medicine and natural therapy in the face of many treatments for post-injury, general surgery or fitness, weight loss, fitness and fitness. (36:17)

The training of the water center is one of the most popular training methods currently used. Water fitness training is one of the preferred forms of training and is not needed

To the skill of swimming and that anyone who wants to practice water training can find the right place to perform water fitness exercises (9:10)

It has been known since the ancient training of the aquatic medium, which has been used in the treatment of muscle weakness and paralyzing laxity due to the reluctance to carry objects and resistance. Floating on water allows the body to move easily and easily from moving on land.

The results of the study of both diabetes charity Ibrahim and Youssef Dahab Ali, Muhammad Jaber Bureka (2001), show the benefits of hydrotherapy for high level athletes and the levels of rehabilitation and treatment by performing a few times in the water medium through the intensity of rapid training and thus gaining high fitness and performance In turn, avoid injury and help to return to normal (stage of recovery) after the performance of competitions or violent exercises or can perform water exercises on a daily basis sequentially and increase the time of the training module and raise some of the motor abilities (strength, speed, flexibility, 5)

Water therapy has played a major role in the treatment of diseases of the nervous system (such as hemorrhagic paralysis, cerebral palsy, multiple sclerosis, Parkinson's disease, inability to walk and others). There are also rehabilitation programs for bones and the elderly through hydrotherapy programs (coordination, , Stretching, stretching, exercises and hydrotherapy),

Where the patient feels completely relaxed due to the buoyancy and neutral temperature relieves the loads on the joints and softens the muscles and continues for a long time because it helps to exercise and tighten and strengthen the muscles.

[2] Lecturer at the Department of Physical Health Sciences Faculty of Physical Education Minia University.

The researcher found that through his work in the field of sports rehabilitation in the center of the most suitable for motor rehabilitation, the researcher noted the frequency of many patients with paralysis of half and difficulty in performing sports exercises movement came the idea of research in the use of means of therapeutic water within the water medium and benefit from Lack of gravity and positive resistance, which have a strong effect in maintaining the motor range and increase muscle strength positively

Search Goal:

The researcher aims to prepare a water rehabilitation program and to identify its effect on some biochemical variables and sensory receptors and the strength and speed of the neural signal for patients with semi-paralysis

Research hypotheses:

1-There are statistically significant differences between the pre and post-experimental measurements of the experimental group in the body environment in question for the benefit of telemetry.

2-There are statistically significant differences between the pre and post measurements of the experimental group in some physical variables in favor of telemetry.

3-There are statistically significant differences between the pre and post measurements of the experimental group in some biochemical variables for the benefit of telemetry.

4-There are statistically significant differences between the pre and post measurements of the experimental group in the strength and velocity of the neural signal for the benefit of telemetry.

Search procedures:

Research Methodology:

The researcher used the experimental method by experimental design of a single experimental group by applying pre measurement and telemetry to suit the nature of the research and its procedures.

research community

Research has been applied to people with paraplegia

The research sample:

The researcher selected the research sample by the intentional method of patients with semi-paralysis, where the sample of the study number (12) infected Homogeneity of the research sample:

Table (1)

Mean, median, coefficient of deviation, coefficient of torsion and flattening coefficient In the anthropometric measurements under study (n = 12)

Variables	Measuring unit	Average	SMA	Coefficient of deviation	Torsion coefficient	Flattening coefficient
Age	Year	60.42	60.00	4.40	0.286	−0.95
Weight	Kg	77.17	77.50	5.20	−0.190	−1.19
Height	Cm	166.75	168.50	6.73	0.880	−0.41
Duration of paralysis	Year	5.25	5.50	0.87	0.862	−1.45

It is clear from Table (1) that all the values of the torsion coefficients of the research sample in the anthropometric variables under study ranged from (+3, -3) indicating the homogeneity of the research sample in these variables.

Table (2)

Mean, median, coefficient of deviation, coefficient of torsion and flattening coefficient In the muscle ocean under study (n = 12)

Variables	Measuring unit	Average	SMA	Coefficient of deviation	Torsion coefficient	Flattening coefficient
Muscular frame of the arm	Cm	29.92	29.50	2.23	0.800	-1.55
Muscular frame of the forearm	Cm	21.33	21.00	0.89	1.11	-0.25
Muscular frame of the thigh	Cm	46.25	46.00	1.71	0.438	-0.73
Muscular frame of leg	Cm	34.50	34.50	1.78	0.00	-1.28

It is clear from Table (2) that all the values of the torsion coefficients for the sample of the muscular ocean research were ranged between (+3, -3) indicating the homogeneity of the research sample in these variables.

Table (3)

Mean, median, coefficient of deviation, coefficient of torsion and flattening coefficient In the physical variables under study (n = 12)

Variables	Measuring unit	Average	SMA	Coefficient of deviation	Torsion coefficient	Flattening coefficient
The motor line of the shoulder	Degree	1.00	1.00	0.74	0.00	-0.86
Motor range of the elbow	Degree	1.17	1.00	0.75	-0.679	-1.10
Axial range of the thigh	Degree	0.83	1.00	0.39	-1.30	2.64
Motor range of the knee	Degree	0.75	1.00	0.40	-1.875	0.15
Motor range of the wrist	Degree	0.79	1.00	0.40	1.575	1.13
Axial range of the ankle	Degree	0.83	1.00	0.39	-1.30	2.64
The strength of the fist	kg	3.33	3.50	0.37	1.378	-0.59
Balance	S	2.92	2.5	0.67	1.880	-0.19

It is clear from Table (3) that all the values of the torsion coefficients of the research sample in the physical variables in question ranged between (+3, -3) indicating the homogeneity of the research sample in these variables.

Table (4)

Mean, median, coefficient of deviation, coefficient of torsion and flattening coefficient In the biochemical variables under study (n = 12)

Variables	Measuring unit	Average	SMA	Coefficient of deviation	Torsion coefficient	Flattening coefficient
Systolic blood pressure	Mm / Hg	118.42	118.50	2.43	−0.987	−1.40
Diastolic blood pressure	Mm / Hg	88.08	88.50	1.93	−0.652	−0.77
Pulse rate / minute	P/m	85.50	85.50	2.61	0.00	0.40
Cholesterol MGDI	Mmol / l	111.42	111.00	1.44	0.874	−0.42
Cholesterol HDL	Mmol / l	54.83	54.50	1.70	0.582	−0.16
Triglyceride	Mmol / l	124.50	124.50	1.31	0.00	0.65

It is clear from Table (4) that all the values of the torsion coefficients of the research sample in the biochemical variables under study ranged from (+3, -3) indicating the homogeneity of the research sample in these variables.

Table (5)

Mean, median, coefficient of deviation, coefficient of torsion and flattening coefficient In the strength and speed of the neural signal under study (n = 12)

Variables	Measuring unit	Average	SMA	Coefficient of deviation	Torsion coefficient	Flattening coefficient
The strength of the nerve signal of the wrist	Degree	13.33	14.00	1.15	1.747	−0.05
The strength of the neural signal of the elbow	Degree	13.92	14.00	1.44	0.166	0.02
The strength of the nerve signal of the shoulder	Degree	16.08	16.00	0.79	0.303	−1.26
The strength of the nerve signal of the ankle	Degree	14.42	15.00	1.08	1.61	1.13
The strength of the nerve signal of the knee	Degree	11.50	11.50	0.52	0.00	−2.44
The strength of the nerve signal of the thigh	Degree	13.75	13.50	1.48	0.506	−1.27
The speed of the nerve signal of	Degree	44.50	45.00	1.73	0.867	3.60

the wrist						
The speed of the neural signal of the elbow	Degree	42.92	43.00	1.24	−0.193	−0.34
The speed of the nerve signal of the shoulder	Degree	55.00	55.50	2.00	0.750	2.66
The speed of the nerve signal of the ankle	Degree	41.83	42.00	1.11	−0.459	−0.87
The speed of the nerve signal of the knee	Degree	76.75	77.00	1.14	−0.657	−1.26
The speed of the nerve signal of the thigh	Degree	74.17	74.00	1.19	0.428	−0.20

It is clear from Table (5) that all the values of the torsion coefficients of the research sample in the strength and velocity of the neural signal in question ranged between (+3, -3) indicating the homogeneity of the research sample in these variables.

The tools and tools used to perform the research

The study included a number of measurements by which it is possible to know the degree of improvement that was made to the sample after applying the preparatory program prepared by the researcher. Several physical and physiological devices were used،

Physical devices

-The dynamometer for the disabled to measure the strength of the grip

-Geometer device to measure the range of motor joints

Medical equipment's

Systolic and diastolic blood pressure monitor

Electrophysiological chart of the muscle (EMG)

-Red light bulb

-B333 electrical alarm

Devices and tools used in the application of the program

-Water level

Used equipment's:

-Registration form for the injured person

Some light loads such as (medical balls, baskets،

Measurement tape (meters)

Tests and measurements used in research:

1-Anthropometric measurements are as follows:

Age	Height
Weight	Duration of paralysis

1. Peripheries muscles as:

Muscular Periphery of the arm	Muscular Periphery of the thigh
Musculoskeletal Periphery of the forearm	Musculoskeletal Periphery of the leg

2. Physical variables are represented in:

The motor line of the shoulder	Motor range of the elbow
Axial range of the thigh	Motor range of the knee

Motor range of the wrist	Axial range of the ankle
The strength of the fist	Balance

3. Biochemical variables are:

Systolic blood pressure	Diastolic blood pressure
Pulse rate / minute	Cholesterol MGDI
HDL cholesterol	Triglyceride

4. . Sensory receptors

The strength of the nerve signal of the wrist	he strength of the neural signal of the elbow
The strength of the nerve signal of the shoulder	The strength of the nerve signal of the ankle
The strength of the nerve signal of the knee	The strength of the nerve signal of the thigh
The speed of the nerve signal of the wrist	The speed of the neural signal of the elbow
The speed of the nerve signal of the shoulder	The speed of the nerve signal of the ankle
The speed of the nerve signal of the knee	The speed of the nerve signal of the thigh

Exploration Experience:

The researcher conducted the exploratory experiment on a sample of (3) infected and out of the basic sample on Tuesday and Wednesday (4-5/10/2016). The researcher concluded the validity and consistency of the tests used in the research and the validity of the tools and devices used in the research as well as training assistants in search.

Proposed Rehabilitation Program:

The researcher applied the proposed rehabilitation program on the sample of the research so that the duration of the rehabilitation program (3) months, equivalent to (36) rehabilitation unit (3) rehabilitation units per week

Foundations of the preparatory program:

The program was developed after reviewing a set of references and scientific researches.

The program is implemented by a specialist

Individual differences should be taken into consideration

Gradient training should be easy to hard

-Attention to exercises that serve the compatibility of musculoskeletal

Demonstration of exercises used in the program on a group of experts in exercise and physical therapy

Components of the qualifying program:

Part One

The use of red rays on the affected parts in an attempt to activate the circulation of the paralyzed parts of both the upper and lower end of the duration of radiation (10 minutes) for each party and that the specialist to do negative exercises on each end of the red light in the period allotted to him (10) Exercises to improve the functional efficiency of each party

through the movements of the specialist, whether to the extent of movement or to strengthen the muscles of the parts affected by paralysis of half

The second part

The electrical alarm, which is based on strengthening the affected parts by sending the electrical impulses to the damaged part, is used in an attempt to alert the muscle and the nervous stimulation to it. It will last for only 10 units from the beginning of the rehabilitation program. Each minute is individually and at the beginning of the alarm use the Fradeck's average intensity to alert the muscles and strengthen muscles

The third part:

Use water-centre exercises to help the paralyzed part move (20 minutes)

Method of applying the qualifying program

1-The program depends initially on the electrical alert and some negative exercises with the help of the researcher

2-Take into account not to continue the exercise when the patient feels pain or complications, consult the specialist doctor

3-It is agreed between the patient and the researcher at the beginning of the program to determine the severity of pain by determining the degree of severity, such as 10%, 20%, 30% or 40% This is done by asking about the level of pain during the performance of the researcher to practice negative

4-Exercises for the healthy parts are also performed in conjunction with working with the damaged parts at the same time until the nervous pathway is modified as the neurons work to send signals to the infected and intact parts at the same time

5-The researcher relies on the water medium to perform the exercises

View and discuss the results:

Presentation and discussion of the outcome of the first hypothesis:

Table (5) Significance of differences between pre and post measurement in the muscular oceans For the sample in question (N = 12)

Variables	Measure unit	Pre measurement		Post measurement		Differences between averages	Improvement rate	Value t
		Average	Coefficient of deviation	Average	Coefficient of deviation			
Muscular periphery of the arm	Cm	29.92	2.23	35.08	2.64	5.16	13.55%	-5.17
Musculoskeletal periphery of the forearm	Cm	21.33	0.89	27.58	1.00	6.25	22.66%	-16.23
Muscular periphery of the thigh	Cm	46.25	1.71	51.42	1.83	5.17	10.05%	-7.14
Musculoskeletal periphery of the leg	Cm	34.50	1.78	44.67	2.15	10.17	22.76%	-12.62

Table (T) = (2.14) at a statistical significance level (0.05)

Table (5) shows that the value (t) calculated between the pre and post measurements of the experimental group in the muscular ocean of the sample in question is greater than the statistical value of (2.14) at a statistical significance level (0.05), indicating statistically

significant differences between The pre and post-experimental criteria for the experimental group and for the post-measurement.

The results indicate that there are statistically significant differences between the pre measurement and the post-measurement in the muscular ocean of the sample in question. These differences are due to the fact that the rehabilitation program used by the researcher has a positive effect in the process of improving the muscle ocean of infected individuals. Abd al-Raziq Yousef Ibrahim Bayoumi (2004) 7 Ali Abdo (2009) (2), all of which refer to the role of rehabilitation programs in Improve the muscular ocean for patients with cerebral palsy.

The researcher also refers to the improvement in the use of the water medium in the rehabilitation process, which led to the exit of the injured from the atmosphere to another atmosphere planted within the force and determination to meet the challenge and the status of water positive role in the rehabilitation process

Lee (2003) asserts that rehabilitation exercises restore the affected limbs back to normal and where muscle strength, tissue referencing, neuronal signal and muscle tone are normalized and compared to the proper part. Exercise and physical activity reduce moderate incidence of stroke and paralysis Half-Life (54:17)

Thus, the first hypothesis of the research, which states that there are statistically significant differences between the preand post-experimental measurements of the experimental group in the body's surroundings, is validated in favour of telemetry.

Presentation and discussion of the outcome of the second hypothesis:

Table (6) Significance of differences between pre − and post − measurement in physical variables For the sample in question (n = 12)

Variables	Measurement unit	Pre measurement		Post measurement		Differences between averages	Improvement rate	Value t
		Average	Coefficient of deviation	Average	Coefficient of deviation			
The motor line of the shoulder	Degree	1.00	0.74	2.75	0.62	1.75	63.63%	-6.28
Motor range of the elbow	Degree	1.17	0.75	3.25	0.75	2.08	64.00%	-6.79
Axial range of the thigh	Degree	0.83	0.39	3.83	0.83	3.00	78.32%	-11.28
Motor range of the knee	Degree	0.75	0.40	2.50	0.52	1.75	70.00%	-9.23
Motor range of the wrist	Degree	0.79	0.40	2.04	0.26	1.25	61.27%	-9.16
Axial range of the ankle	Degree	0.83	0.39	3.17	0.39	2.34	73.81%	-14.68
The strength of the fist	Kg	3.33	3.50	11.25	0.65	7.92	70.40%	-91.59
Balance	S	2.92	2.5	8.95	0.14	6.03	67.37%	-11.46

Table (T) = (2.14) at a statistical significance level (0.05)

Table (6) shows that the value of (t) calculated between the pre and post-experimental measurements of the experimental group in the physical variables of the sample in question is greater than the statistical value of (2.14) at a statistical significance level (0.05), indicating statistically significant differences between The pre and post-experimental criteria for the experimental group and for the post-measurement.

The above improvement is also evident in the physical variables of the sample in question. This improvement is due to the role of the rehabilitation program in improving the physical variables under consideration and in view of the role of the water medium used by the researcher in performing physical exercises, (2004). (7) Mr Ali Abdo (2009) (1) Abdel Razek Yousef Ibrahim Bayoumi (2004) 2)

The researcher also refers to the improvement in the motor range and the physical variables of the research sample. The rehabilitation program aims to maintain the functional efficiency of the affected parts and the muscle tone and prevent spasms and muscle cramps. It also works to strengthen the working muscles on the injured side and improve the motor range of the affected joints. The muscle groups are working to not stiffen the injured joints

It is also clear that the rehabilitation exercises are one of the most important treatment methods to prevent contractions and stiffness joints and maintain the flexibility of the joints in order to maintain balance and compatibility between the injured party and the non-infected.

Lentz AA (2012) and Lichon Hancock Nicola (2016) agree that the use of electrical or electrical radiation devices to remove severe chronic pain in the joints and muscles that the patient feels and activate blood circulation. The strength of the injured party improves its function and returns the injured party to a dependent currency of the right side (18:20) (19:17)

Thus, the second hypothesis of the research, which states that there are statistically significant differences between the pre and post measurements of the experimental group in some physical variables in favour of telemetry.

3-Presentation and discussion of the outcome of the third hypothesis:

Table (7)

Significance of differences between pre - and post - measurement in biochemical variables For the sample in question (n = 12)

Variables	Measurement unit	Pre measurement		Post measurement		Differences between averages	Improvement rate	
		Average	Coefficient of deviation	Average	Coefficient of deviation			
Systolic blood pressure	Mm / Hg	118.42	2.43	115.92	1.51	2.5	2.11%	3.03
Diastolic blood pressure	Mm / Hg	88.08	1.93	91.08	1.73	5.00	5.67%	-4.01
Pulse rate / minute	P/m	85.50	2.61	81.33	1.07	4.17	4.87%	5.11
Cholesterol MGDI	Mmol / l	111.42	1.44	102.00	0.85	9.42	8.45%	19.46
Cholesterol HDL	Mmol / l	54.83	1.70	41.67	1.56	13.16	24.00%	19.81

Triglyceride	Mmol / l	124.50	1.31	111.17	1.03	13.33	10.70%	27.66

Table (T) = (2.14) at a statistical significance level (0.05)

Table (7) shows that the value of (t) calculated between the pre and post-experimental measurements of the experimental group in the biochemical variables of the sample in question is greater than the (T) statistical value of (2.14) at a statistical significance level (0.05) The pre and post-experimental criteria for the experimental group and for the post-measurement.

From the above it is clear that there are statistically significant differences between the pre and post measurement of the research sample in the biochemical variables. The researcher attributes these differences to the preparatory program used by the researcher through the water medium with cerebral palsy patients, which led to improvement of biochemical variables among the affected individuals. (2004) (7) Mr. Ali Abdo "(2009) (2) the study was conducted by Dr. Abdel-Razek Yousef Ibrahim Bayoumi،

Many others, such as Naima Aoun (2011), indicate that rehabilitation or therapeutic exercises improve and regulate the percentage of certain blood components such as haemoglobin, triglyceride and HDL cholesterol, and also emphasizes that therapeutic exercises improve the physical and functional efficiency of the body and improve Biochemical variables of cerebral palsy resulting from strokes and cerebral haemorrhage (20:14.)

Thus, the third hypothesis of the research, which states that there are statistically significant differences between the pre and post indices of the experimental group, is achieved in some biochemical variables for the benefit of telemetry.

4-Presentation and discussion of the outcome of the fourth hypothesis:

Table (8)

Indication of the differences between the pre and post measurement in the strength and speed of the neural signal For the sample in question (n = 12)

Variables	Measuring unit	Pre measurement		Post measurement		Differences between averages	Improvement rate	
		Average	Coefficient of deviation	Average	Coefficient of deviation			
The strength of the nerve signal of the wrist	Degree	13.33	1.15	24.75	0.75	11.42	46.14%	-28.68
The strength of the neural signal of the elbow	Degree	13.92	1.44	18.00	1.13	4.08	22.66%	-7.72
The strength of the nerve signal of the shoulder	Degree	16.08	0.79	25.33	2.06	9.25	36.51%	-14.52
The strength of the nerve signal of the ankle	Degree	14.42	1.08	19.00	0.74	4.58	24.10%	-12.11
The strength of the nerve signal of the knee	Degree	11.50	0.52	20.33	2.50	8.83	43.43%	-11.99
The strength of the nerve signal of the thigh	Degree	13.75	1.48	24.42	2.39	10.67	43.69%	-13.13

The speed of the nerve signal of the wrist	Degree	44.50	1.73	33.58	1.51	10.92	24.53%	16.48
The speed of the neural signal of the elbow	Degree	42.92	1.24	30.67	0.98	12.25	28.54%	26.80
The speed of the nerve signal of the shoulder	Degree	55.00	2.00	33.75	0.97	2.25	38.63%	33.15
The speed of the nerve signal of the ankle	Degree	41.83	1.11	32.08	1.08	9.75	23.30%	21.73
The speed of the nerve signal of the knee	Degree	76.75	1.14	65.75	1.48	11.00	14.33%	20.37
The speed of the nerve signal of the thigh	Degree	74.17	1.19	63.25	1.66	10.92	14.72%	18.51

Table (T) = (2.14) at a statistical significance level (0.05)

Table (8) shows that the value of (t) calculated between the pre and post measurements of the experimental group in the strength and velocity of the neural signal of the sample in question is greater than the value of (2.14) in the statistical significance level (0.05), indicating that there are significant differences Statistically between the pre and post criteria of the experimental group and for the sake of telemetry.

It is clear from the above that there are differences between the pre measurement and the telemetry in the variable (strength and speed of the neural signal) where it is clear that there are differences between the measurements in the speed of the nerve signal and the strength of the nerve signal and these differences are due to the role of the preparatory program prepared by the researcher and within the water medium, Effect of positive and effective in improving the speed and strength of the nerve signal of the injured individuals of the research sample.

This is consistent with the result of the Hancock study (2011), which confirms that therapeutic exercises work to improve and increase the strength and speed of the nerve signal and improve balance in the cerebral palsy patient, which was measured from the EMG device, which is measuring the speed of the nerve signal and the strength of nerve signal from the brain to Muscle and vice versa (21:17)

Thus, the fourth hypothesis of the research, which states that there are statistically significant, differences between the pre and post measurements of the experimental group in the strength and velocity of the neural signal for the benefit of telemetry

Conclusions

-The use of the proposed rehabilitation program led to an improvement in the level of biochemical variables for patients with paralysis.

-The use of the proposed rehabilitation program led to an improvement in the level of sensory receptors for patients with paralysis.

-The use of the proposed rehabilitation program led to an improvement in the strength and speed of the nerve signal for patients with paralysis

Recommendations

-Use of proposed water center exercises because of their importance in improving the functional variables of patients with paralysis.

-Expanding the use of the water medium because of its positive in the improvement of the variables related to the rehabilitation of semi-paralysis.

-Training courses for sports rehabilitation specialists in how to use hydrotherapy.

References

1-Abdul Aziz Al-Nimr, Nariman Al-Khatib: Weight Training, Force Programs Design, and Planning the Training Season, Al-Kuttab Publishing Center, Cairo, 1996

2-Abdul Razzaq Yusuf Bayoumi: Effect of training exercises on the physical fitness of patients with paraplegia due to stroke, 2004.

3-Ashraf Abdel Salam Mohamed: Effect of training exercises and therapeutic massage on the efficiency of the locomotors system for patients with paralysis caused by cerebral palsy, unpublished Master thesis, Faculty of Physical Education, Helwan University, 2003.

4-Bereukov :a.a:&vaseleva a.a.f:sportevnay_a massage fezkoltora e sports moskva. 1981

5-Feder Ricardo Mayor: The Disabled of Human Ten UNESCO Message No. 236, Arabic edition of UNESCO Journal Cairo, 1997

6-Hayat Ayad Rufail: Playground injuries (prevention, ambulance, physiotherapy), Dar El Maaref, Cairo, 1986.

7-Hancock Nicola J., tee : Shepstone Philip roué, phyo kyall myint Valerie poverty : clinical efficacy and prognostic indicators for lower limb pedaling exercise curly after stole study protocol for a pilot randomized controlled frail, Bio. Med center control , 2011

8-Hesse S., Welz A., Werner C., Quentin B. and wissel J : Comparison of an intermittent high-intercity VS continuous low intensity physiotherapy service over (12) months in community dwelling people with stroke : a randomized trail , clinical rehabilitation, (25); 146-156 , 2011 .

9-Hwaida Haidar Al-Sheikh: Effect of a proposed rehabilitation program for improving the movement of prostheses for the limb amputations in Khartoum State, unpublished PhD thesis, University of Khartoum, Sudan, 2015

10-Hussein Mohamed Sadiq Al-Meselhi: Effect of a proposed behavioral therapy program to improve some of the motor abilities of the physically disabled (cerebral palsy), unpublished doctoral thesis, Faculty of Physical Education, Cairo, 1996

11-Lee CD, Folsom AR, Blair SN. Physical activity and stroke risk: a meta-analysis. Stroke. 2003;34(10):2475–2481. [PubMed].

12-Lentz AA, Mattlage AE, Ashenden AL, Rippee MA, Billinger SA. J Stud Phys Ther Res. 2012;5(2):72-78.

13-Mohamed Fadl: study morphological variables and function associated with patients with paraplegia caused by cerebral thrombosis as a basis for the program of rehabilitation sports, unpublished Master thesis, Faculty of Physical Education, Tanta University, 2007

14-Mohammed Jaber Barka, Ihab Fawzi Albdaiwi (2005): Integrated system in the training of strength and muscular endurance, Knowledge elbow , Alexandria.

15-Mohamed Sobhy Hassanein: Evaluation and Measurement in Physical Education, Part I and II, Second Edition, Arab Thought House, Cairo, 1987.

16-Mohamed Massad Abdel Samad: Effect of a proposed therapeutic program for the treatment and improvement of some motor abilities of patients with paraplegic paralysis patients, unpublished master thesis, Faculty of Physical Education, Helwan University, 2002.

17-Mr. Ali Abdo: A program of behavioral rehabilitation proposed inside and outside the water to improve some of the motor functions of cases of lateral paralysis lateral unpublished Master thesis, Faculty of Physical Education, Alexandria University, 2009

19-Nahed Ahmed Abdel-Raheem: Rehabilitation Exercises for Education, 1 Cairo, 2003, Training for the Disabled in the Community: A Guide for Developing Countries in Rehabilitation, Part 1, Policy and Planning Manual, WHO Regional Office for Mediterranean Affairs, Alexandria

20-Naima Abdel-Salam Aoun: Effect of a proposed rehabilitation program on some functional and physical variables of paralysis caused by stroke, unpublished PhD thesis, University of Jordan, 2011

21-Ya-Xuan Hung, PhD, Pei-Chen Huang, OT, Kuan-Ta Chen, PhD, and Woei-Chyn Chu, PhD Monitoring Editor: Ovidiu Constantin Baltatu. 2016

22-Zeinab Abdel-Hamid Al-Alam: Sports Massage and Playground Injuries, Dar Al-Fikr Al-Arabi, Cairo, 1999