

The effect of rehabilitating exercises by using a therapeutic medium on some motor abilities of hemiplegia patients

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Abstract

Cerebral palsy "is one of the diseases that afflict children, and it is a term given to the condition of a child who is exposed to a normal brain injury by accident due to its inability to grow or damage to the cells of the areas responsible for movement and knowledge of strength and balance during the stage of normal development." (116: 1999: 10) Cerebral palsy causes disruption in movement and posture due to damage to brain cells in areas that control and coordinate muscle tone, reflexes, strength, and movement. The degree and location of brain damage varies greatly between people with paralysis, as well as the severity of disability and symptoms, as they fall into severe to very simple, and cerebral palsy is one of the diseases that cause a child to be unable to move normally due to damage to brain cells and this affects his growth, despite this. These children have legitimate rights to live independently if services, means and rehabilitation programs are available to them that develop their mobility abilities and prepare the necessary capabilities for their growth and take care of them during their various stages of development. The simple cerebral does not rise to what exists in other developed countries, and that the exercises given to the injured need to be reorganized in terms of time and effort, and this situation indicates a problem that must be developed solutions from here came the importance of preparing rehabilitative exercises using a therapeutic medium to improve some movement abilities of children with hemiplegia Helping them to move and control their body parts in a balanced and healthy way.

Keywords: rehabilitating, therapeutic, hemiplegia.

research objectives

Preparing rehabilitation exercises using a therapeutic medium for patients with hemiplegia.

To know the effect of rehabilitating exercises using a therapeutic medium on some of the movement capabilities of patients with hemiplegia.

Force search

There are statistically significant differences between the pre and post tests of the experimental and control groups in the studied variables.

There are statistically significant differences between the experimental and control groups in the post-tests in the studied variables.

Research areas

The human domain: a sample of patients with hemiplegia, ages 7-10 years.

The temporal domain: from 3/8/2019 to 10/25/2019.

Spatial domain: The Happiness Institute for Physical Handicaps / Ministry of Labor and Social Affairs, Baghdad.

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Research Methodology

The researcher used the experimental method in a tight control method for the two groups (experimental and control), since “it is the nature of the problem that interferes with the approach that can be used.” (25: 2000: 12)

Research community and sample

- The research community identified those with simple cerebral palsy at the Happiness Institute for Physical Handicap in Baghdad, whose number is (28 disabled) students aged 7-10 years, and the researcher deliberately selected a sample of (12 students) as choosing a sample in the community is a model that represents an aspect or a part of society. (255) 2009: 8

- The researcher divided the sample randomly into two equal groups with (6) injured for each group, as the control group applied the center’s curriculum and applied the exercises prepared by the researcher on the experimental group, and the researcher verified the homogeneity and parity of the individuals of the research sample as shown in Tables (1) and (2)).

Table (1)

Shows the homogeneity of the research sample in variables (height - weight - age - severity of injury)

Variables	Unit of measurement	Arithmetic medium	Broker	Standard deviation	Twisting coefficient
Length	Cm	141	140	3,217	0,932
Weight	The government's support	36,8	36	2,859	0,839
Age	Year	9,4	9,3	1,426	0,210
Severity of injury	All members of the sample have mild cerebral palsy.				

Devices and tools used in the search

The therapeutic medium consists of the following devices

- world Wide Web .
- Parallel device.
- stairs.
- The built-in electric treadmill with the balance device.

Force sensor.

- medical balance.
- Hand grip device.

Tools

- tape measure.
- stopwatch.
- A numbered ruler.

- A large ball for balance.

Means of gathering information

- Personal interviews.

The questionnaire.

- Test and measurement.

Field research procedures

Determine search variables

The researcher conducted personal interviews with a number of doctors and specialists and prepared a questionnaire that included a group of children's motor abilities. The questionnaire was presented to a group of experts and specialists. After collecting the data, the results took 100% of the experts' agreement on the following movement abilities (muscle strength - flexibility - balance) .

Determine the research tests

After determining the mobility abilities by experts and specialists, the researcher presented a set of tests using a questionnaire to the experts and specialists, and after collecting the data, the results took the results of choosing the tests that obtained an agreement rate of 85% or more, as shown below.

First: Test the strength of the fist right - left (120: 1987: 11)

Second: testing the muscle strength of the abdominal muscles, right-left, using a strength sensor device. (71: 2014: 4)

Third: The test for bending the torso forward from a long sitting position (to measure the flexibility of the back and thigh) (2015: 66: 5)

Fourth: Walking in a straight line (to measure balance) (64: 2015: 2).

Exploratory experience

The researcher conducted his exploratory experiment on 1/4/2019 on a sample of children with cerebral palsy, as their number reached 3 children from outside the main research sample and the purpose of the experiment was to ensure the work of the devices and to identify the negatives and positives facing the researcher during the main experiment as well as the suitability of exercises for the research sample and to ensure the efficiency of the assisting work team in applying exercises and tests to the sample, adjusting the time for performing the exercises, and verifying the scientific basis for the tests.

- The scientific basis for the tests

First: Certification of tests:

For the purpose of verifying the validity of the tests used in the research, the researcher adopted the method of validating the content by presenting the tests to a group of experts and specialists, and verified the validity through the percentage of expert agreement.

Second: Stability tests:

To verify the stability of the tests, the researcher used the method of testing and retesting on the sample of the pilot experiment and extracting the simple correlation coefficient between the results of the two tests, and the results proved that all values of the reliability coefficient were high.

Third: Objectivity of the tests: - To verify the objectivity of the tests, the researcher relied on the results of two analysts during the re-test and extracted the simple correlation coefficient between the results of the two tests. The results resulted in all the tests being of high objectivity.

Pre-tests

The researcher assisted the assistant work team to conduct the pre-tests in the physiotherapy room on the research sample (experimental - and control) on Monday 15/4/2019 at nine o'clock in the morning according to the following sequence (strength tests - flexibility - balance) and the data of the pre-tests were approved In ensuring that the two research groups are equivalent in the searched variables, as shown in Table (2).

Tests	Unit of measurement	Experimental Group		The command group		Valued* Calculated	sig	Indication
		Q	P	Q	P			
Muscle strength right hand grip	The government's support	9,2	0,63	9,4	0,76	0,453	0,327	Insignificant
Muscle strength, left hand grip.	The government's support	7,8	0,72	8,6	0,81	0,027	0,458	Insignificant
Muscle strength, right abdominal muscles	Newton	9,4	1,57	7,9	1,42	0,137	0,182	Insignificant
Muscle strength, abdominal muscles left	Newton	6,9	1,44	9,2	1,65	0,408	0,165	Insignificant
Bend the torso forward.	Cm	18,2	1,51	6,17	1,94	0,545	0,267	Insignificant
Walk On a straight line.	Number of times	6,3	0,42	8,3	,490	0,694	0,183	Insignificant

* Significant if sig <0,05

The therapeutic environment

The therapeutic medium consists of the following parts:

- 1- The spider web, which is a three-sided network with a roof, and the fourth open rib made of iron, 2.5 meters high and 2.5 meters wide, divided into small squares, this net works to reduce the child's weight during exercise.
- 2- Parallel device, which is a device consisting of two horizontal columns on poles connected to the ground, intended to improve the walking step of the injured.
- 3- The motor, built-in walking device, with the balance device, the child can run on it at different speeds, and the child is connected to a carriage made for children tied to a pole that is pulled over the treadmill and the handicapped child is connected to it so that he can perform the running on the device safely.

Rehabilitation exercises

The researcher presented the rehabilitating exercises to a group of experts to demonstrate their validity for the sample members and after verifying their validity.

- The exercise began on Monday (May 20, 2019) at nine o'clock in the morning and at the Physiotherapy Unit at the Happiness Institute for the Disabled.
- Rehabilitation exercises were implemented for a period of (12) weeks, implemented on days (Sunday - Tuesday - Thursday), and the duration of the rehabilitative exercise was applied every day (45 minutes).
- (5-10) minutes of warm-up before re-training exercises performed by the assisting work team.

- (30-35) minutes of various exercises that included exercises (feeling - strength - flexibility - balance - walking) and were conducted inside the therapeutic activities room.

The first, second, and third week included emotion exercises.

The week (fourth - fifth - sixth) included strength exercises.

The week (seventh - eighth - ninth) included flexibility exercises.

The week (tenth - eleventh - twelfth) included balance exercises.

- The researcher followed the principle of progression by implementing the qualifying exercises.

Dimensional tests

The researcher conducted the post-tests of the research sample (experimental and control) in the physiotherapy room at the Institute of Happiness at nine o'clock in the morning, corresponding to Wednesday, August 14, 2019, in a sequence similar to the sequence of pre-tests (strength - flexibility - balance).

- statistical means

The researcher used the statistical bag (spss) to process the data.

Present, analyze and discuss the research results

Presenting, analyzing and discussing the results of the pre and post tests of the experimental group in the studied variables.

Table (3)

It shows the arithmetic mean, standard deviations, and the value of t calculated between the pre and post tests of the experimental group in the searched variables

Variables	Tribal testing		After testing		Q.F.	P.P.	Valued* calculated	sig	Statistical evidence
	Q	P	Q	P					
Muscle strength right hand grip	2,9	63,0	13,4	0,92	4,2	1,48	6,953	0,001	Significant
Muscle strength, left hand grip	7,8	0,72	9,8	0,54	1,1	0,68	3,971	0,001	Significant
Muscle strength, right abdominal muscles	4,9	1,57	6,11	0,47	2,2	0,79	6,832	0,000	Significant
Muscle strength, abdominal muscles left	6,9	1,44	9,11	0,32	2,3	0,96	5,882	0,000	Significant
Bend the torso forward	2,18	1,51	6,51	26,1	2,6	0,74	8,609	0,001	Significant

Walk On a straight line	6,3	0,42	5,7	65,0	3,9	1,53	6,250	0,000	Significant
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* Significant if sig <0,05

Table (3) shows the values of t calculated to indicate the differences between the pretest and the post test for the experimental group, as the results showed that all the values of the significance level sig came less than 0.05 and this indicates the presence of significant differences between the pre test and the post test and in favor of the post test of the studied variables and the researcher isolates that improvement in Muscular strength, flexibility and balance of the injured to the rehabilitative exercises prepared by the researcher, and this is what Edington pointed out. "Structured training results in an increase in the individual's performance capacity as a result of performing physical exercises for several weeks and months, by printing the body's organs to the optimal performance of those exercises (810: 1976: 13).

The researcher also believes that the typical exercises that she followed work to stretch the muscles to the maximum extent possible, and thus the fibers are aligned in parallel and get rid of adhesions, and that performing these exercises regularly has the ability to restore most of the bone tissue to its normal length over time. Gives the injured flexibility exercises for the purpose of improving muscle length and joint flexibility, because this helps the flow of movement "(1998: 200: 1).

The researcher also attributes the improvement in the balance of the injured children to the rehabilitative exercises for each device within the therapeutic environment, as these exercises helped to increase the patient's ability to rely and improve the angles of the body joints during walking, as Maher Hussain points out that "one of the scientific foundations in the physiotherapy session for injured children is With cerebral palsy to reach the stage of balance, the motor is the use of a comfortable position for the child in addition to voluntary and automatic control of the muscle joints and the correction of the posture ending in stability in the exercise "(130: 2006: 9).

Table (4)

It shows the arithmetic mean, standard deviations, and the value of t calculated between the pre and post tests for the control group in the searched variables

Variables	Tribal testing		After testing		Q.F.	P.P.	Valued* calculated	sig	Statistical evidence
	Q	P	Q	P					
Muscle strength right hand grip	4,9	76,0	9,7	0,85	0,30	0,81	0,909	0,111	Insignificant
Muscle strength, left hand grip	6,8	0,81	8,8	0,61	0,20	0,92	0,533	0231	Insignificant
Muscle strength, right abdominal muscles	7,9	1,42	,99	0,36	0,20	0,86	0,569	0,217	Insignificant
Muscle strength, abdominal muscles left	2,9	1,65	8,9	0,45	0,60	0,98	1,500	0,184	Insignificant
Bend the torso forward	6,17	1,94	4,71	34,1	0,20	1,42	1,063	0,193	Insignificant

Walk On a straight line	8,3	0,49	2,4	77,0	0,40	0,65	1,509	0,211	Insignificant
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Table (4) shows the values of t calculated to indicate the differences between the pre-test and the post-test for the control group, as the results showed that all the values of the sig significance level were higher than 0.05, and this indicates that there are no significant differences between the pre-test and the post-test of the studied variables and the researcher attributes that to non Adopting the scientific foundations in terms of repetitions, time and rest between the exercises used in the rehabilitation center despite the effort made by the workers at the center and their constant eagerness to improve the capabilities of the children reviewing the center.

Table (5)

Show the arithmetic mean, standard deviations, and the value of t calculated between the experimental and control groups in the post-tests of the searched variables.

Tests	Experimental Group		The command group		Calculate d T* value	sig	Statistical evidence
	Q	P	Q	P			
Muscle strength right hand grip	,413	0,92	9,7	0,85	6,607	0,000	Significant
Muscle strength, left hand grip.	8,9	0,54	8,8	0,61	2,747	0,001	Significant
Muscle strength, right abdominal muscles	6,11	0,47	9,9	0,36	6,439	0,000	Significant
Muscle strength, abdominal muscles left	9,11	0,32	9,8	0,45	8,536	0,000	Significant
Bend the torso forward	6,15	0,46	4,17	0,68	4,918	0,001	Significant
Walk On a straight line	5,7	0,65	2,4	,770	7,333	0,000	Significant

* Significant if sig <0,05

Table (5) shows the values of t calculated for the significance of the differences between the experimental and control groups in the post tests of the investigated variables, as the results showed that all the values of the significance level sig came less than 0.05, and this indicates the presence of significant differences between the experimental and control groups in the post-tests and for the benefit of the experimental group and the researcher attributed that to Exercises applied to the experimental group, which helped children to perform motor skills through improving their motor abilities, and this was confirmed by (Imad Ahmed), "Rehabilitation in a holistic sense means developing and developing the capabilities of the affected person to be independent and helps the person overcome the negative effects left by disability" (12: 2016: 7).

The improvement in strength variables helped the patient to increase the ability to control more than before the movement of the legs and to strengthen the muscles working on the joints of the legs in addition to the role that the force played in the performance of movement and thus it is a result of the development of walking balance and Yeshi (Adel Hassan 1995) "Movement exercises for children with disabilities An important means for their correct growth, because through it, muscles are strengthened, balance is maintained, ligaments and joints are more flexible, and the functional efficiency of the body's organs is improved, which is reflected in the state of health (1995: 30: 6).

And that the exercises prepared by the researcher had an effective and positive role in improving some of the motor capabilities of the experimental group, as they significantly affected the strength, flexibility and balance of children with hemiplegia. Great on physical fitness restoration such as restoring strength, dexterity, compatibility, endurance, speed, flexibility, and restoring competence and general fitness "(21: 2000: 3).

Conclusions

- 1- Rehabilitation exercises within the therapeutic environment have an effective effect on improving muscle strength tests among the members of the experimental group.
- 2- Rehabilitation exercises within the therapeutic environment have a positive effect on improving back and thigh flexibility among the experimental group.
- 3- Rehabilitative exercises within the therapeutic environment have a positive effect on improving the ability to walk in a balanced manner among the members of the experimental group.

Recommendations

- 1- Preparing standardized movement programs for children with hemiplegia to improve their motor abilities.
- 2- Training the technical personnel working in the physiotherapy centers on the rehabilitative programs prepared by specialized researchers.

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