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## The effect of rehabilitative exercises using the (Fit Light) technology on improving comprehensive balance abilities of temporarily hemiplegia females aged (45-55) years

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### Abstract

The research aims to prepare rehabilitative exercises using the Fit Light technology for women suffering from temporary hemiplegia, aged (45-55) years old. It also aims to understand the effect of these exercises on improving their comprehensive balance abilities for rehabilitation purposes. The researchers hypothesized that there are statistically significant differences between the pre-test and post-test results for both the experimental and control groups in rehabilitating women with temporary hemiplegia (comprehensive balance abilities). They also proposed that there are statistically significant differences between the post-test results of the experimental and control groups in rehabilitating women with temporary hemiplegia (comprehensive balance capabilities). The experimental approach was adopted with the design of both experimental and control groups on a sample of patients who frequent the Medical City hospital, with a total of (11) patients chosen deliberately using comprehensive enumeration. They represent about (84.615%) of their original population. The experiment continued on them for a month and a half, with (30) rehabilitation units. After the completion of the experiment, the results were processed using the SPSS statistical software. The conclusions and recommendations are that the application of rehabilitation exercises using the Fit Light technology is suitable for women suffering from temporary hemiplegia, aged between 45 and 55 years old. Additionally, these exercises help improve comprehensive balance abilities of women with temporary hemiplegia in the same age group. It is essential to pay attention to integrating engaging and motivating methods along with the implementation of rehabilitation exercises, and training those in charge of rehabilitation on how to positively utilize these methods in rehabilitating women with temporary hemiplegia aged (45-55) years old. It is also necessary to avoid exaggeration with the level of illumination and colors of the Fit Light technology and its multiplicity in the rehabilitation environment. There needs to be a compatibility in its operation with the application of each rehabilitation exercise and its goal

### Keywords

Rehabilitation exercises, Fit Light technology, comprehensive balance abilities

### Introduction:

The part of the brain most affected by temporary hemiplegia from a stroke is the region where several nerve fibers converge, such as the group of nerves that carry nerve signals to the muscles of the body. After the patient regains consciousness, they may suffer from partial paralysis, as damage to the right side of the brain causes paralysis of the left section of the body

because the nerve fibers that carry motor nerve signals from the brain to the muscles cross to the other side in the lower part of the brain. Similarly, damage to the left side of the brain causes paralysis of the right section of the body, with these injuries leading to greater disability." [\(12\)](#)

"Indeed, hemiplegia arises from an injury to the pyramidal region at any point in its dedicated pathway, from the source in the cerebral cortex to below the fifth cervical vertebra of the spinal cord. This causes a disruption in body movement, or in the shape of body, or both, as a result of one or more affected in the central nervous system (the brain)." (2)

"Stroke is considered one of the most medically and socially concerning conditions. The main causes of this condition are brain Cerebral hemorrhage and stroke. The increase in the number of patients with hemiplegia is attributed to the increased life pressures and the rise in the average age of individuals." (9)

"Since muscles determine the external shape of the body, it is natural that any weakness affecting the muscles or certain muscle groups associated with any part of the body will eventually lead to an imbalance in body posture. The muscles connected to the spinal column have a significant impact on increasing or decreasing the spinal curves. Therefore, if these muscles weaken, the balance is disrupted, and the shape of the natural curves changes according to this weakness, subsequently leading to postural deviations." (15)

"Balance is known as the strength of a muscle or a group of muscles and its relative relationship with another muscle or group of muscles. The muscular balance is often considered as the relative limits of muscular strength." (14)

"Indeed, there are two types of balance (static and dynamic). Static balance is defined as maintaining postural balance while the body is in a stationary position; whereas dynamic balance is the ability to maintain postural balance while moving different parts of the body." (6)

In rehabilitation, the neuromuscular work involves utilizing various sports sciences and rehabilitation tools to direct movements in rehabilitation exercises that simulates reality in terms of their type or nature. Additionally, modern technology, such as the Fit Light technology, with its multi-colored and graded

lights, which provide an exciting and engaging atmosphere in the rehabilitation environment.

This technology is employed to facilitate the initiation or completion of exercises according to specific needs and directions. Another aspect of its influence is in enhancing brain signals (EEG) by implementing these exercises in an environment of excitement that requires attention, sensory direction, and stimulation."

"When the muscle fibers that receive commands from the brain are stimulated, each individual muscle fiber adheres to the 'all-or-none' principle, meaning that a muscle fiber either contracts fully or not at all. The generation of movement effort occurs only when the nerve impulse is capable of modifying the motor endplate's excitability, causing the threshold level of excitation at the motor endplate to decrease. Thus, if any stimulus affects the motor cell, it will either affect it entirely or not affect it at all." (13)

Thus, it is possible to invest non-harmful light within the visual threshold in rehabilitating exercises using the Fit Light technology. This can stimulate the brain through affecting the visual sense to obtain the desired response, or control and direct this response to serve the sports rehabilitation of patients suffering from temporary hemiplegia. It aims to restore their overall balance, which gives them the ability to perform their usual tasks as they were in their normal state before the injury. The theoretical significance of this research lies in its ability to provide a reference framework for those in charge of rehabilitating temporary hemiplegia injuries, in terms of the novelty and specialization of rehabilitation exercises. From a practical aspect, the importance of this research is that it may assist the affected individuals themselves in improving their comprehensive balance abilities, after safely and gradually testing them, enabling them to return to their normal lives. The research problem involves temporary hemiplegia in women, which is a common condition affecting individuals between

45 and 55 years old. It is considered one of the side effects experienced by those who have suffered from brain health disorders such as stroke. These neurological disorders often result in muscle weakness or impairment, prompting increased attention in the medical and healthcare fields towards addressing them through various physical rehabilitation programs. The aim is to accelerate the restoration of muscle function to its pre-injury state, particularly focusing on the functionality of the controlling nerves rather than muscle tissue damage. The research problem lies in the fact that women with temporary hemiplegia, aged between 45 and 55 years, face challenges related to the duration of rehabilitation programs or psychological apprehensions towards receiving electrical stimulation and other methods used in rehabilitation centers. After the researchers conducted the research, investigation, and visiting the majority of rehabilitation and physical therapy centers in Baghdad, and reviewing several Arabic and foreign references, as well as utilizing the international information network, and engaging in discussions with doctors and specialists in sports rehabilitation. They noticed the need to integrate between brain stimulation and muscle activation methods, in order to achieve the principle of comprehensiveness in sports rehabilitation. This integration aims to have an immediate impact on both the brain and muscles using simplified and accessible techniques that are free from complexity, while also providing an element of desire and excitement for the patients to continue their rehabilitation without interruption until its completion. The researchers' attempt is to contribute to scientific efforts that focus on this type of injury, and to utilize the science of sports to serve one of the most important segments of society, women, and to provide support to healthcare professionals in rehabilitation centers through the use of rehabilitation exercises with modern techniques, under the supervision of specialized physicians, to prevent the worsening

of these injuries in case of neglect. Therefore, this research aims to prepare rehabilitation exercises using the (Fit Light technology) for women aged (45-55) suffering from temporary hemiplegia. It also seeks to understand the impact of rehabilitation exercises using the (Fit Light technology) on improving comprehensive balance abilities in the rehabilitation of individuals with temporary hemiplegia within this age range. The researchers hypothesized that there are statistically significant differences between the pre-test and post-test results of both the experimental and control groups in terms of the rehabilitation of individuals with temporary hemiplegia (comprehensive balance abilities). They also anticipated statistically significant differences in the post-test results between the experimental and control groups in terms of the rehabilitation of individuals with temporary hemiplegia (comprehensive balance abilities)

#### **Method and Procedures:**

The experimental approach was used, which is defined as "a pattern of research in which the researcher controls one or more variables to intentionally and systematically bring about changes in specified conditions, and analyzes the results of these changes" (4). This was done using a controlled experimental design that included two groups, experimental and control, with pre- and post-testing. The observed phenomenon in the current research problem compelled the researchers to conduct a survey to find women aged (45-55) who are temporary hemiplegia resulting from a stroke. These women visit rehabilitation centers in various hospitals within the Medical City Department in Baghdad (Baghdad Teaching Hospital, Al-Shaheed Ghazi Al Hariri Hospital, and the Private Nursing Home Hospital) as the boundaries of this population. As it is difficult to collect them in the same period of time. Due to the difference in the age of their stroke that leads to this type paralysis. Thus, the research population was procedurally defined as female

patients who experienced stroke within the time frame of (1-3) days prior to the specified dates, from 10/11/2022, to 15/11/2022. As the number of visitor patients within these hospitals was (13), and they were relatively similar in terms of the level and age of their infected. With the assistance of specialist doctors, their selection for the research sample was purposefully determined using a comprehensive approach, after the specialists confirmed their diagnosis and met the required criteria for the specificity of the current research, based on Magnetic Resonance Imaging (MRI) examination. Due to the non-compliance of (2) patients in revisiting the hospital, the total sample for the research became (11) patients, representing (84.615%) of their original population. Furthermore, in order to maintain the internal validity of the experimental design, the researchers needed to control all the extraneous variables affecting it by using statistical treatments to ensure their homogeneity, and by following academic methodological procedures in sports rehabilitation. Before beginning the experiment, the researchers obtained written consents from each participant to volunteer for the application of rehabilitation exercises using Fit Light technology, with a commitment to continue rehabilitation until full recovery. According to the determinants of the aforementioned experimental design, the sample was divided into two groups, as closely matched as possible in anthropometric measurements. The first group comprised (6) patients, and the second had (5) patients. Then, one of the groups was randomly chosen to be the experimental group, consisting of (5) patients, while the first group of (6) patients represented the control group. By employing this procedural approach, the researchers avoided biases in selection, distribution, and division within the determinants of this experimental design.

#### **The measurements and procedures:**

The researchers adopted the Berg Balance Scale, which is a laboratory-based test primarily

designed for assessing balance in older adults. It was developed by Catherine Berg and her colleagues in (1989) in the field of physical therapy. It assesses performance adequacy through a number of functional tasks that comprise (14) everyday movements representing comprehensive measurement of balance movements. The total score ranges from 0 to 56, as follows: (20).

1. Sitting to standing.
2. Standing without assistance.
3. Sitting without support.
4. Standing to sitting.
5. Transfers.
6. Standing with eyes closed.
7. Standing and stepping.
8. Reaching forward with outstretched arms.
9. Picking up an object from the ground.
10. Turning to look behind.
11. Turning 360 degrees.
12. Placing alternate foot on the ground.
13. Standing with one foot in front of the other.
14. Standing on one foot.

#### **The researchers also adopted the following methods and tools in their study:**

1. Arabic and foreign sources.
2. International information network (the internet).
3. Individual face-to-face interviews with doctors and specialists.
4. Observation and experimentation.
5. Berg Balance Scale for the rehabilitation of temporary hemiplegic patients.
6. Various paper forms for data collection and transcription.

#### **The following devices were also used in the research experiment:**

1. Fit Light technology, custom-made by the researcher specifically for the patients, quantity (1).
2. A light color-changing control device made by the researcher, quantity (1).
3. A Rest meter for measuring weight (kg) and overall body height (cm), quantity (1).

4. MO brand electronic stopwatch, made in China, quantity (1).

**The tools used in the research experiment were as follows:**

1. Parallel walking: Quantity (1).
2. Foam roller: Quantity (10).
3. Square-shaped sponge pieces of various sizes: Quantity (10).
4. Elastic cloth strips (bandages) of different sizes: Quantity (5).
5. Balance discs: Quantity (10).
6. Power Resistance rubber ropes with varying levels (1-3): Quantity (10).
7. Air-filled half balls with plastic base and wires: Quantity (5).
8. Air-filled half balls with plastic base without wires: Quantity (5).
9. Medical bed: Quantity (1).
10. Wooden chair and wooden plank: Quantity (5).

The experiment in this research started with the application of pre-test for the Berg Balance Scale. The researchers prepared rehabilitation exercises using the Fit Light technology, which included the appropriateness between the light with isometric and dynamic muscle contraction under light resistances, in various positions such as lying on the back, lying on the stomach, standing, sitting on a chair, and on a half rehabilitation bed. The exercises started with a duration of (5-10) seconds, with appropriate rest intervals between each exercise. The single therapy session included four exercises,

incorporating the principle of diversity and the exchange of working the muscles of the body in each of the aforementioned positions, that is, the experiment lasted for a month and a half, with rehabilitation therapy sessions for these exercises conducted five days a week as planned for the three stages. depending on the improvements the patients would achieve in muscle work for overall balance. The total number of rehabilitation units was (30) units over a consecutive six-week period. During the application of these exercises, interim tests were conducted for the dependent variables; with the goal of understanding the effectiveness of these rehabilitative exercises and evaluating them. The application of these rehabilitation exercises began at the Rehabilitation Center in the Private Nursing Home Hospital on Sunday (11/20/2022), and ended on Thursday (12/29/2022). Additionally, there were accompanying medical recommendations for the rehabilitation exercises. After completing the experiment, the post-tests were conducted on Monday (2/1/2023). The researchers collected the scores of the pre-tests and post-tests and analyzed the results using the Statistical Package for the Social Sciences (SPSS) software. They calculated measures such as the percentages, arithmetic mean, standard deviation, and t-test for independent samples, as well as the t-test paired samples.

**Results:**

**Table (1)  
shows the pre-test results between the two research groups.**

The test and unit of measurement	The group and its number		Arithmetic Mean	Standard Deviation	Levene's value	(Sig)	(t)	(Sig)	The significance of the difference
Berg Balance Scale (score)	Experimental	5	5.6	3.435	0.711	0.421	0.659	0.527	Not-Significant
	Control	6	6.83	2.787					

Not-significant when (Sig) < (0.05) at a significance level of (0.05) and degrees of freedom (n-2) = (10).

**Table (2)**  
shows the results of the pre-test and post-test measurements for the two experimental groups

The test and unit of measurement	The group	Comparison	Arithmetic Mean	Standard Deviation	The average difference	SDD	(t)	(Sig)	The significance of the difference
Berg Balance Scale (score)	Experimental (5)	pre-test	5.6	3.435	48	5	21.466	0.000	Significant
		post-test	53.6	1.673					
	Control (6)	pre-test	6.83	2.787	36.667	4.719	19.034	0.000	Significant
		post-test	43.5	3.391					

Not significant: (Sig)  $\geq$  (0.05) at a significance level of (0.05) and degrees of freedom (n) - (1).

**Table (3)**

shows the results of the post-test measurements between the experimental and control groups.

The test and unit of measurement	The group	The number	Arithmetic Mean	Standard Deviation	(t)	(Sig)	The significance of the difference
Berg Balance Scale (score)	Experimental	5	53.6	1.673	6.037	0.000	Significant
	Control	6	43.5	3.391			

Significance of Difference (Sig)  $\geq$  (0.05) at a significance level of (0.05) and degrees of freedom (n1 + n2 - 2) = (10)

**Discussion:**

Through reviewing the pre-test and post-test results in Table (2), it is evident that women with temporary hemiplegia resulting from stroke in both the experimental and control groups showed improvement in their comprehensive balance abilities in the post-test compared to the pre-test. Referring to the results in Table (3), it can be seen that women in the experimental group outperformed women in the control group in terms of improvement in comprehensive balance abilities. The researchers attribute these results to the positive impact of rehabilitative exercises using the Fit Light technology, which assisted in their application stages to achieve the required improvement. These exercises were well-suited for this group of patients and aided in strengthening muscle tone, enhance body posture and movement to regain the desired normal condition. The Fit Light technology helped in providing elements of excitement and stimulation in the rehabilitative environment. More

importantly, it stimulated the brain to release the necessary commands through its effective alignment with light colors and durations, while ensuring the continuation of the rehabilitation exercises. The number of repetitions distinguished by being in accordance with the abilities and suitability of each individual patient, taking into consideration their unique rehabilitation needs. This approach helped increase neuromuscular control and regain function through influencing sensors that transmit information about the body's position to the vestibular system, and then to the nervous system to complete control by restoring neural commands for the desired function.

As for the control group, factors such as practice, repetition, and commitment to rehabilitation programs in the hospital helped improve their condition during the same period that their counterparts in the experimental group received. They did not achieve the same level of improvement.

"The development of muscle condition requires a significant level of capacity during the duration, repetitions, and intensity of exercise. The more accurately we master this, the more it contributes to the physiological capacity development." (11)  
Furthermore, "the benefits of exercise can be summed up in the improvement of both strength and muscle balance, where muscle balance on both sides of the body is the actual foundation for a good physique. Additionally, the exercise can adjust the shape of the body from the current position it is in to the ideal position that it should be." (19)

"Indeed, without our sensory receptors, we would be completely unable to coordinate our body movements. These receptors provide us with information about our muscles, our movement locations, and our joints. The receptors at the nerve endings in the muscles, muscle tendons, joints, and the information received from them give us the foundation and sense to make coordinated movements, and they collaborate with the vestibular sense (the sense of orientation or body balance)." (17)

As "neuromuscular performance is one of the complex abilities that require good levels of other fitness components, such as balance, agility, and strength, all sports activities and exercises rely on varying degrees of movement coordination and synchronization in a constantly changing environment. Despite the complexity and intertwined nature of the processes associated with neuromuscular coordination, the human brain is capable of easily integrating information coming via the sensory organs, muscles, and joints, providing a wide range of adaptive behaviors. In the field of sports, there is a need to understand the underlying behavioral and neural mechanisms and perceive them in order to enhance and improve performance." (16)

Also, "the neuromuscular performance is of great importance because its development is one of the main objectives of physical education. The significance of movement coordination is not limited to sports activities but extends to an

individual's daily life. All aspects of daily life require a certain level of coordination among different body parts. Muscular-neural performance refers to an individual's ability to integrate multiple movements using various body parts simultaneously, with smoothness and high precision." (3)

"The vestibular system is the organ that detects sensations of balance. It consists of a set of bony tubes and chambers located in the petrous part of the temporal bone, called the bony labyrinth, within which lies a set of membranous tubes and chambers called the membranous labyrinth, which is the functional part of this system. There is a gelatinous spot in this system containing a number of small calcium carbonate crystals called otoconia or 'balance dust'. Thousands of hair cells are located in this spot, and the bases and tips of these cells intertwine with the sensory endings of the vestibular nerve. Other factors influencing balance include deep sensory receptors in the neck, and visual information." (5)

"Additionally, the progression and variety of exercises, starting from simple to difficult, and repetitions are important to create muscle dynamics during the implementation of the rehabilitation program." (7)

"Dynamic balance is an important element as it is part of the movement components that need to be considered." (24)

"Variation in exercises and the use of assistive tools during balance training are important." (18)

"Movement therapy holds particular significance in the field of rehabilitation, especially in its final stages, in preparation for the patient's recovery." (10)

"The great necessity lies in the use of therapeutic and rehabilitation means alongside rehabilitation exercises." (23)

"Physical therapy (rehabilitation) helps in speeding up the recovery process by providing the appropriate environment and conditions." (22)

"The use of appropriate rehabilitation or treatment requires evaluating the condition of the affected part functionally and anatomically, with

determining the degree of injury, before starting any rehabilitation program. This is so the suitable rehabilitation program can be developed and the desired result achieved. Rehabilitation exercises play an important role as they are a significant means to return the affected part to its normal state." (1)

"There are several objectives for rehabilitation, including restoring, developing, and enhancing physical fitness components in a manner consistent with the nature of the activity being performed, as well as taking advantage of the negative phase of the movement." (8)

### **Conclusions:**

1. The application of rehabilitation exercises using the (Fit Light) technique is suitable for women with temporary hemiplegia between (45-55) years.
2. The application of exercises using the (Fit Light) technology helps improve comprehensive balance abilities in women with temporary hemiplegia aged between (45-55) years.

### **Recommendations:**

- 1- It is necessary to focus on integrating engaging and motivating methods along with the application of rehabilitation exercises, and training those in charge of rehabilitation professionals on how to positively invest these for the rehabilitation of women with temporary hemiplegia aged between (45-55) years.
- 2- It is necessary to avoid exaggeration with the level of illumination and colors of the Fit Light technology and its multiplicity in the rehabilitation environment, and to ensure its alignment with each rehabilitation exercise and its goal.

### **Author's declaration:**

**Conflicts of interest:** None

We confirm that all tables and figures in this article are ours and written by the researchers themselves.

**Ethical-Clearance:** this manuscript approved by local ethical committee of physical education

and sport sciences college for women on (April /2023)

### **Author's contributions:**

All contributions of this study were done by the researchers (Z.Q. and S.H.) who give the main idea and make all procedures and conclusions with number of experts, Zahraa Qassim collect the Statistics, Huda Shamil in revision, Inaam Ghalib in translating, Ahmed Rajab in proofreading

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### Appendix

First Level, Week: Second, Rehabilitation Unit Session: Ninth Day and Date: Wednesday 30/11/2022 Rehabilitation location: Physical Therapy Department at Private Nursing Home Hospital					Rehabilitation Unit Duration: (15) minutes Rehabilitation Unit Objective: Strengthening the muscles of the legs entirely				
Seq.	Exercise	Figure illustrating the exercise	Exercise objective	Exercise duration	Number of repetitions	Rest between repetitions	Sets	Rest between sets	The use of Fit light technology
1	From a prolonged sitting position on the bed, gently pull the feet backwards from the instep of the foot using a light elastic band, slowly and according to the patient's ability.		Strengthening the leg muscles.	5 sec	10	5 sec	1	2 min	When the green light illuminates on the panel in front of the patient, and at a rhythmically set frequency, the action of pulling the feet back is repeated until completion.
2	In the same previous exercise position, gently pull the feet backwards from the sole with a strap, slowly and according to the patient's ability.		Strengthening the leg muscles.	5 sec	10	5 sec	1	2 min	When the red light illuminates on the panel in front of the patient, and at a rhythmically set frequency, the action of pulling the feet back is repeated until completion.
3	In the same previous exercise position, gently pull the feet backwards from the sole using a level (1) resistance band, slowly and according to the patient's ability.		Strengthening the leg muscles.	5 sec	10	5 sec	1	2 min	When the blue light illuminates on the panel in front of the patient, and at a rhythmically set frequency, the action of pulling the feet back is repeated until completion.
4	In the same previous exercise position, gently pull the feet backwards from the sole using a level (2) resistance band, slowly and according to the patient's ability.		Strengthening the leg muscles.	10 sec	5	10 sec	1	2 min	When the yellow light illuminates on the panel in front of the patient, and at a rhythmically set frequency, the action of pulling the feet back is repeated until completion.

Second Level, Week: Third, Rehabilitation Unit Session: Twelfth Day and Date: Wednesday 5/12/2022 Rehabilitation Location: Physical Therapy Department at Private Nursing Home Hospital					Rehabilitation Unit Duration: (15) minutes Rehabilitation Unit Objective: Improving Static Balance.				
Seq	Exercise	Figure illustrating the exercise	Exercise objective	Exercise duration	Number of repetitions	Rest between repetitions	Sets	Rest between sets	The use of Fit light technology
1	From a standing position, with the foot of the unaffected side on a balance disc, supporting the body with the hand on a chair and maintains stability according to the patient's ability.		Improving Static Balance	5 Sec	10	5 Sec	2	1 min	When the red light illuminates on the panel in front of the patient, the exercise begins by supporting the body with a hand on a chair until it is completed.
2	From a standing position, she holds onto a chair with her hand and lifts the leg on the affected side, flexing the knee joint at a (60) degree angle backward, and maintains stability on the unaffected leg.		Improving Static Balance	5 Sec	10	5 Sec	2	1 min	When the green light illuminates on the panel in front of the patient, the exercise begins with flexion of the knee joint until it is completed.
3	From a standing position, she holds onto a chair with her hand and lifts the leg on the affected side, flexing the knee joint at a (70) degree angle backward, and maintains stability on the unaffected leg.		Improving Static Balance	5 Sec	5	10 Sec	1	2 min	When the blue light illuminates on the panel in front of the patient, the exercise begins with flexion of the knee joint until it is completed.
4	From a standing position, she holds onto a chair with her hand and lifts the leg on the affected side, flexing the knee joint at a (80) degree angle backward, and maintains stability on the unaffected leg.		Improving Static Balance	5 Sec	5	10 Sec	1	2 min	When the yellow light illuminates on the panel in front of the patient, the exercise begins with flexion of the knee joint until it is completed.

## تأثير تمارين تاهيلية بإستعمال تقنية (Fit Light) في تحسين قدرات التوازن الشاملة للمصابات بالشلل النصفي المؤقت بأعمار (45-55) عام

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ملخص البحث

هدف البحث إعداد تمارين التاهيلية بإستعمال تقنية (Fit Light) للمصابات بالشلل النصفي المؤقت بأعمار (45-55) عام، والتعرف على تأثير هذه التمارين في تحسين قدرات التوازن الشاملة لتأهيلهن من الاصابة، وأفترضت الباحثتان بأنه توجد فروق ذات دلالة احصائية بين نتائج الاختبارات القبلية والبعدي لمجموعتي البحث التجريبية والضابطة في تأهيل المصابات بالشلل النصفي المؤقت (قدرات التوازن الشاملة)، وتوجد فروق ذات دلالة احصائية بين نتائج الاختبارات البعدية لمجموعتي البحث التجريبية والضابطة في تأهيل المصابات بالشلل النصفي المؤقت (قدرات التوازن الشاملة)، وأعتمد المنهج التجريبي بتصميم المجموعتين التجريبية والضابطة على عينة من المصابات اللواتي يرتادن مستشفيات مدينة الطب البالغ عددهن (11) مصابة اختيرن عمدياً بأسلوب الحصر الشامل ليمثلن ما نسبته (84.615%) من مجتمعهن الأصل، واستمر التجريب عليهن لمدة شهر ونصف بواقع (30) وحدة تاهيلية، وبعد الانتهاء من التجريب تمت معالجة النتائج بنظام ((SPSS لتكون الاستنتاجات والتوصيات بأنه أن تطبيق تمارين التاهيلية بإستعمال تقنية (Fit Light) يلائم مصابات بالشلل النصفي المؤقت بأعمار (45-55) عام، ويساعد تطبيق التمارين بإستعمال تقنية (Fit Light) في تحسين قدرات التوازن الشاملة لدى النساء المصابات بالشلل النصفي المؤقت بأعمار (45-55) عام، ومن الضروري الأهتمام بدمج الوسائل المشوقة والمحفزة مع تطبيق التمارين التاهيلية، وتدريب القائمين على التأهيل على كيفية استثمار إيجابياتها في تأهيل النساء المصابات بالشلل النصفي المؤقت بأعمار (45-55) عام، ومن الضروري عدم المبالغة بمستوى أضاءة وألوان تقنية (Fit Light) وتعددتها في البيئة التاهيلية وضرورة الموائمة بعملها مع تطبيق كل تمرين تاهيلي وهدفه

تمارين تاهيلية، تقنية (Fit Light)، قدرات التوازن الشاملة

الكلمات المفتاحية