

## **The Effect of a Rehabilitation Program and Chiropractic Exercises to Improve the Functional Efficiency of the Spine to Relieve Low Back Pain**

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### **Introduction and research problem:**

Natural therapeutic means are one of the important and safe means that the world's attention has begun to turn to at a wide pace, as it secures the use of everything that is natural in all life affairs, and avoids the side effects that accompany the use of unnatural things, as modern means and techniques are widely used in rehabilitation. Among the groups of society, prepared according to scientific foundations, including massage, which is one of the important means of rehabilitation on which it depends; Because it is characterized by the lack of needs and the ease of performing it, in addition to its medical effects on the speed of recovery, and due to the different methods of massage depending on the desired goal or the part of the body that is being performed on it and the different nature of the muscular work performed, it is necessary to marry between the muscular work performed and the method of massage that is performed, where the kinetic range is considered one of the problems. The important thing that limits the efficiency of the individual and prevents him from continuing to perform. (1:23(٢:٤١٩)

The use of chiropractic in rehabilitation contributes to achieving the best achievement in treating the injury from its roots, as chiropractic saves about three quarters of the time required for the rehabilitation process, and it achieves two goals: relieving pain and increasing the range of motion. , Matekel) (2010) that Chiropractic is the science of manual manipulation and is based on treating vertebral vertebrae that have changed their natural positions and movement as a result of stress, injuries or other causes; Which benefits all parts of the body that have been damaged due to the malposition of the vertebrae of the spine. (13:159)

We note that lower back problems are among the health problems that many suffer from at the present time. There are two types of causes behind the occurrence of pain in the lower back. The first type is related to lifestyle, such as standing or sitting in the wrong way, lack of exercise and excessive life pressures, and the second type is caused by injuries and diseases. Its direct effect on lower back problems such as anemia, tuberculosis and osteomalacia for children and adults (١٦٢ :٣) .

In order to treat such injuries, especially lower back problems, we find that "Giles and Muller" (2011) indicated that there are many methods used, which play an important role in achieving the goals of rehabilitation, namely, the use of massage and chiropractic, which plays an important role in the speed of healing and achieving recovery (18:4); According to this view, the study of Robert H. Shmerling, M.D. (2004) and the study of the American Chiropractic Association (2008) indicated that effective methods with a quick, clear and safe effect such as the use of healing and chiropractic massage sessions should be used to achieve a higher and faster rate. In the rate of recovery, which prevents the negative effects and psychological damage resulting from the long treatment and rehabilitation period (8) (٢٢ :١٩)

Among the indicators of this is the study of "Hondras, Long, and Rowell" (2010) and the study of "Wilkey et al (2008)" that chiropractic treatment and manual therapy for the spine are effective in treating many cases of injuries. It plays an important role in getting rid of pain, and the association of this type of treatment with other therapeutic methods such as massage, movement therapy, nutrition and prevention achieves effective results in the treatment process (13: 175) (15) (16.(٤٧٠ :٢١)

Through this, the research problem lies in knowing whether chiropractic and massage have an effective effect in increasing the range of motion of the spine and reducing the pain resulting from lower back problems. functional spine and reduce the degree of pain.

Hence, the importance of the research lies in subjecting some non-traditional therapeutic methods to study and experimentation in a precise and respected scientific framework, and its results and numbers are appreciated by integrating the use of chiropractic and manual massage and their employment in the rehabilitation of lower back pain effectively and safely.

**Research goal:**

The objective is designing a rehabilitation program using manual and chiropractic massage to improve the functional efficiency of the spine to relieve low back pain; this is done by identifying the following sub-objectives:

- 1- degree of pain
- 2- The range of motion of the spine in all directions.

**Research hypotheses:**

- 1) There are statistically significant differences between the mean pre and post measurements of the experimental group in the variables under investigation (pain degree, spinal kinematic range) in the direction of the post measurement.

**Research terminology:****1- Chiropractic:**

It literally means the science of practicing manual movement, orthotics, or manual correction of the vertebrae of the spine. It is a science that is mainly concerned with studying the mechanical relationships between the various bones of the body, especially the spine and the pelvis. It is also concerned with the relationship between these bones and between nerves, muscles and blood vessels. (١١٦٢ :١٤)

**Previous studies:**

1. A study by Bahjat Al-Saeed Bahij Al-Nadi (2014 AD) (4) entitled: "The effect of a rehabilitation program with chiropractic and massage with air cups on cases of lumbar disc herniation without surgery." The strength of the back and abdominal muscles improved, and the researcher used the experimental method and the researcher applied the research to a deliberate sample of (20) patients with first-degree lumbar herniated disc, and their ages ranged between (45-55) years. The proposed rehabilitation program under study when rehabilitating lumbar herniated disc patients without surgery has a better and faster effect in reducing the level of pain, improving the range of motion of the spine, flexibility of the lumbar region, and strength of the abdominal and back muscles.
2. Abd al-Rahman Mansour Abd al-Jaber (2014) (5) conducted a study entitled "The Effect of a Rehabilitation Program Using Chiropractic on the Speed of Healing of Muscle Tears," where the research aimed to identify: Among the players with second-degree ruptures at Petrojet Sports Club, the experimental method was used, and the

- results of the study were that the rehabilitation program and chiropractic sessions played a role in improving the healing of muscular ruptures in favor of telemetry.
3. The study "Rubinstein SM & Van Middelkoop M" (2011) (20) entitled: "Manipulation of the vertebrae as a treatment for chronic low back pain" Chronic back, and the research sample included a group of individuals who suffer from chronic low back pain, the researcher used the experimental method, and the results of the research were: This study proved that manual manipulation of the vertebrae is one of the most important methods of treating spine diseases.
  4. The study of Robert H. Shmerling, M.D. (2012) (19) entitled "Chiropractic and treatment of lower back pain." This study aimed to identify the role of chiropractic sessions in rehabilitation programs in eliminating lower back pain for a group of hockey players. In the state of Boston in the United States of America, the research sample was about 20 players from five clubs, and the researcher used the experimental method for two groups.

**Research procedures:****Research Methodology:**

The researchers used the experimental method, using the experimental design for one group using the (pre- and post-test) measurement, in order to suit the nature of the research.

**Research community:**

The research community was represented in the women attending the sports medicine unit in Fayoum Governorate.

**Research sample:**

The research sample was chosen in a deliberate way from women with low back pain who attended the sports medicine unit in Fayoum, and the sample included:

- 1) The exploratory sample and it included (5) women between the ages of (35: 45) years from the research community and from outside the main sample.
- 2) The basic sample, which included (15) women, their ages ranged between (35: 45) years, where the researcher applied the program under study to them.

### The mean distribution of the research sample:

The skew coefficient was calculated to show the mean distribution of the research sample in the anthropometric variables (age, height, weight) as shown in Table.( $\xi$ )

**Table (1)**  
Arithmetic mean, standard deviation, and skew coefficient of anthropometric variables

(n = 15)

Variables	Average arithmetic	Mean	Standard deviation	Skewness
Age	39.067	39.0	2.028	.17
Length	109.180	109.44	4.94	.001-
weight	72.236	71.68	0.129	.16

It is evident from Table ( 1 ) that the values of the skewness coefficient of the anthropometric variables under consideration were limited to ( $\pm 3$ ), which indicates the moderation of the data distribution.

### Data collection methods:

#### Tools and equipments used:

**A- Data registration form:** It is a data registration form for each case and includes data (age - height - weight - flexibility of the spine - degree of pain).

#### B- Equipments used:

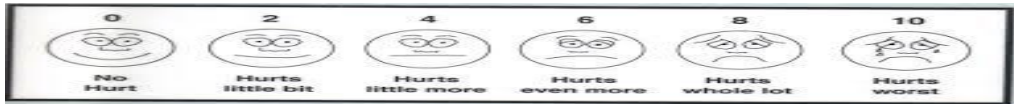
1. A rheostat for measuring length in centimeters.
2. Visual Analogue Scale ( VAS ) to measure the degree of pain.
3. A genomic device to measure range of motion and trunk flexibility.
4. Medical scale to measure weight in kilograms.
5. Measuring tape lengths scaled in centimeters.
6. Stopwatch

### The measurements used in the research

#### Pain meter:

#### Optical analogue meter description:

It is a scale in the form of a ruler on one side, which corresponds to the patient. There is no gradation on it except for a straight line of length (10 cm) marked on the far left (no pain) and a mark on the far right (maximum pain) and in the middle (medium pain), and the opposite side The doctor is listed in centimeters from (zero) to (no pain), and up to (10) corresponding to (maximum pain).



**Shape (1)**  
**Pain scale**

### Method of measuring the degree of pain:

The patient is asked about the degree of pain he feels to put a mark on the face he is facing, and the specialist compares the other face listed from zero to ten degrees to indicate the degree of pain . or not.

### Measuring the flexibility of the spine (right - left - forward - back):

The researchers measured the flexibility of the spine (right - left - front - back) as follows:

Instruments: genomics device.

Performance Specifications:

1. The patient stands in moderation with the feet slightly apart, and the genome is placed on the thigh joint from the front or back, then bends aside (right - left) as far as possible while keeping the knees straight and the arm aligned with the lower extremity, and taking measurements.
2. The patient stands in moderation with the feet slightly apart, and the genometer is placed on the thigh joint from one side, then bends (forward - backward) as far as possible while keeping the knees straight and the arm aligned with the lower end, and taking measurements.

**Table (2)**

Variables	Variables	Average arithmetic	Mean	Standard deviation
Low back pain degree	٨.١٦٧	٨	٠.٨٣٤	٠.٣٣-
Flexibility of the spine to the right	٣٩.٥٣٣	٣٨	٣.٧٤٨	١
Flexibility of the spine to the left	٣٩.٢	٣٨.٠	٤.٣٩٠	٠.٦٩٧
Flexibility of the spine forward	٤٣.٤	٤٣	٢.٦٧٣	٠.٢٩٣
Flexibility of the spine backward	١٥.٨٣٣	١٦	٢.٦٧٩	٠.٠٠٥-

It is evident from Table (2) that the values of the skewness coefficient of the variables under consideration were limited to ( $\pm 3$ ), which indicates the moderation of the data distribution.

- **Steps to prepare the proposed kinetic physical rehabilitation program:**

- A- The main objectives of the proposed program:**

- Return of the normal functions of the spine, represented by:**

- 1) Reducing pain as much as possible.
- 2) Improvement of the range of motion of the spine.
- 3) Improved muscle strength of the back and abdomen.
- 4) Trying to get as close as possible to the natural state of practicing normal daily life.

- B- The foundations of building a physical kinetic rehabilitation program:**

- 1) The opinion of the attending physician (specialist).
- 2) Defining the main and sub-goals.
- 3) Determine the appropriate time for the program and achieve its objectives.
- 4) Choosing the appropriate exercises and identifying the specialists entrusted with implementation.
- 5) Determine the tools and devices that can be used in the program.
- 6) Choosing and setting timings for testing and evaluation to ensure the correctness and accuracy of program implementation and achievement of results.
- 7) The flexibility of the program and its feasibility for practical application.
- 8) Taking into account the patient's ability to treat.

- C- The basis for choosing the exercises included in the program:**

- 1) Taking into account that the proposed exercises are in line with the general objective of the program.
- 2) The exercises should go with the available possibilities.
- 3) Taking into account the gradation in the selected exercises, from easy to difficult and from simple to complex.
- 4) Taking into account the suspense and enthusiasm factor through diversity in exercises and avoiding boredom.
- 5) The gradation in the load in terms of intensity and size through the number of repetitions and the duration of the training unit.
- 6) Taking into account individual differences in the implementation of the program according to the condition, preparations and capabilities of each injured person.
- 7) The flexibility of the program and its feasibility for practical application.

- 8) Specificity, where attention is paid to the muscles working on the spine and abdomen, as well as exercises that focus on the lower back.
- 9) Movement exercises, flexibility and stretching exercises are done within the limits of pain.

#### **D- Preparing stage for the experiment:**

##### **The design of the proposed qualification program:**

The researcher conducted a survey of the reference framework for research through references and previous studies, whether at the local level or from foreign sources, in order to obtain the latest studies that were carried out in the field of treating lower back pain from therapeutic exercises, as well as the latest rehabilitation methods that dealt with lower back pain to reach the construction of the physical program Rehabilitation movement, which is compatible with the nature of the age group (35-45) years.

##### **Expert opinion poll:**

The researchers prepared an electronic questionnaire using Google Forms and distributed it electronically to the experts in the period from 6/2021AD to 7/2021AD, by sending the link to the electronic questionnaire using e-mail (E-Mail) and the (WhatsApp) application. The experts' opinion was surveyed Annex (1) on the number of massage and chiropractic sessions that will be used with the sample under consideration for the rehabilitation of lower back pain.

##### **Based on the opinion of experts, the researchers identified the following:**

- 1) The period of the program is (6 weeks) at an average of (3) qualification units, amounting to (18) units as a whole.
- 2) The number of manual massage sessions is two sessions per week, (12) sessions, the duration of the session is (30) minutes.
- 3) The number of chiropractic sessions is one session per week, at the rate of (6) sessions, the duration of the session is (20:30) minutes, Annex (2).
- 4) Rehabilitation sessions begin using a set of warm-up exercises through walking for a period of (5) minutes; And stretching exercises for the muscles of the arms, legs and neck in a time of (5:10) minutes.
- 5) The session time ranges from (30 s: 45 s) according to the individual differences among the sample members.



**The survey:**

In light of the research problem, goal and assumptions, the researchers conducted an exploratory study on a sample of five women with lower back pain who were selected from the original research community, outside the limits of the basic sample, from 7/7/2021AD until 10/7/2021AD.

**Objectives of the survey:**

- 1) Identifying the difficulties that the researcher may face when applying the basic experiment.
- 2) Verifying the validity of the devices and tools used.
- 3) Identifying the appropriate arrangement for conducting tests and measurements
- 4) Identifying the obstacles to the measurement process.
- 5) Determining the appropriate conditions for measuring the research variables.
- 6) Carrying out the exact measurements used.

**The results of the survey revealed the following:**

- 1- The validity of the equipment and tools used was checked.
- 2- Appropriateness of the tests used to measure the research variables.
- 3- The method implemented in the measurement and data recording was emphasized.
- 4- The appropriate conditions for measuring the research variables were identified.

**Research application:****Pre-measurement:**

The researchers carried out the tribal measurement on the research sample on Thursday, 7/29, 2021 AD, and those measurements were represented in the research variables (height - weight - degree of pain - flexibility of the spine) using the data and measurements registration form.

**Basic experiment:**

The researchers carried out the basic experiment from 1/8/2021AD to 9/9/2021AD, where manual massage sessions were carried out on (Sunday - Thursday) and chiropractic sessions on (Tuesday) of each week.

**Post-measurement:**

The researcher carried out the post-measurement on the research sample on Sunday 12/9/2021 AD, after completing the application of the basic study, and those measurements were represented in the research

variables (pain degree - flexibility of the spine) using the patient's data and measurements registration form.

### Statistical processing:

Data were collected and processed by Microsoft Excel; The data was also processed statistically through the use of the ready-made statistical packages program (SPSS) version (26) in order to extract the results through the following equations:

1. Arithmetic mean.
2. Mean.
3. Standard deviation.
4. Skewness.
5. T-test to indicate differences.

The researchers satisfied a significant percentage (0.05) in all stages of the research.

## Presentation and discussion of results

### Results presentation:

Table (3)

The mean pre- and post-measurement and t-values of the sample under investigation

n = 15

S	Variables	Variables	Average arithmetic	Mean	Standard deviation	T Value
١	Low back pain degree	٨.٣	١.١	٧.٢	٠.٦٣٢	٣٦
٢	Flexibility of the spine to the right	٣٩.٩	٦١.٣	٢١.٤	٢.٦٣٣	٢٥.٧٠١
٣	Flexibility of the spine to the left	٣٩.٥	٦٠.٥	٢١	٢.٩٤٤	٢٢.٥٥٨
٤	Flexibility of the spine forward	٤٣.١	٦٠.٥	١٧.٤	٥.٣٥٨	١٠.٢٦٩
٥	Flexibility of the spine backward	١٥.١	٢٤.١	٩	٢.٢٦١	١٢.٥٨٩

Tabular T-value at 14 degree of freedom and 0.05 = 1.753

### It is evident from Table (3) that:

It is clear from Table (3) that there are statistically significant differences between the mean of the pre-measurement and the mean of the post-measurement of the experimental group in question in the variables under investigation (pain degree, kinetic range of the spine) in the direction of the post-measurement, as the calculated "T" values were greater From the tabular t-values indicating the effectiveness of manual and chiropractic massage in treating low back pain in the research sample.

The researchers attribute the results of the general improvement that occurred to the Previous measurement , which may be due to the decrease in the level of muscle tension in the lower back as a result of muscle work as a result of the use of manual massage and chiropractic, which may explain the high level of flexibility of the muscles working on the spine, as Majed Megali et al. (2007) Table (3) indicates that flexibility is related to muscle temperature, and that raising the temperature of the muscles using any of the appropriate means (exercises - heat compresses - massage) causes relaxation in tense muscles, as well as Marshall and others (Marshall, et al.) (2008) Table ( 17) that massage may increase the level of metabolism in the muscles, which increases their activity and flexibility, and also believes that the ability of the individual to carry out the requirements of his daily life is strongly correlated with the degree of flexibility and the degree of pain, and this may explain the differences between the pre-measurement and the post-measurement, which contributes In increasing the individual's ability to carry out daily chores, and the results of this study are in agreement with the study of Majid Megali et al. (2007) (6), where he confirmed that appropriate natural means (exercises - heat compresses - massage) raise the level of the ability to perform daily activities. To carry out daily chores and reduce the level of pain and disability.

As for the improvement in the level of the range of motion, the researchers believe that this improvement in the range of motion led to the removal of muscle tension and an increase in the level of muscle and ligament relaxation well, thus improving their length, allowing the joints to be used at a greater angle to help the muscles produce a greater range of motion due to the use of massage and chiropractic Which is one of the effective positive treatment methods, and its therapeutic effect lasts for long periods, the lengthening obtained by the research sample was positive, and this may explain the improvement in the level of motor range.

The results of the current research on the effectiveness of the proposed rehabilitation program in improving the range of motion of the spine, and the muscle strength of the affected area (the lumbar region) agree with what was mentioned by Bronfort et al. (2010) (10) that many studies have been conducted in Treatments used by chiropractors and commonly used manual therapies have been shown to be effective in treating low back pain, and these results are consistent with what was indicated by the studies of Bernard et al (2002) (9), and Dave Schmitz (2003) (12) in terms of the fact that massage and chiropractic contribute to

improving motor fitness and range of motion and restoring postural balance. The results of the study of Mustafa Ibrahim Ahmed (2004) (7: 98) agree that the balanced development of flexibility Muscle elongation in rehabilitation programs has an important effect in increasing the mobility of joints, and may also be effective in treating many problems such as lumbar disc herniation, neck pain, as well as injuries to the locomotor system, whether they are muscles or bones.

In terms of improving the degree of pain sensation, the researchers attribute this to the manual and chiropractic massage and the effectiveness of combining them in contributing to raising the pressure on the vertebrae and returning the natural space between the vertebrae, thus releasing the nerve and removing pain. This is in agreement with the findings of Cross KM, Kuenze C, Grind staff TL, Hertel J (2011) study that the effect of using chiropractic improves pain, range of motion, and functional status of people with lumbar pain(11) .

## **Conclusions and Recommendations**

### **Research conclusions:**

In light of the research objective, hypotheses, procedures and results, and through statistical analysis, the following conclusions were reached:

- 1) The use of manual and chiropractic massage led to an improvement in the condition of the patients in the sample under study and a decrease in their sense of pain resulting from moving the spine.
- 2) The use of Chiropractic led to an increase in the flexibility of the spine of the sample under investigation.
- 3) Combining chiropractic with manual massage had a quick effect in reducing pain among the members of the research sample.
- 4) Chiropractic coupling with manual massage had a positive effect in increasing the flexibility of the spine.

### **Research recommendations:**

In light of the research objective, hypotheses, procedures and results, and through statistical analysis, the researcher can recommend the following:

- 1- Using chiropractic and manual massage to overcome lower back pain for cases similar to the research sample.
- 2- Considering Chiropractic and massage an effective way to reduce lower back pain.
- 3- Reliance on manual and chiropractic massage to restore the flexibility of the spine for patients with lower back pain.
- 4- Directing researchers to do research similar to this research on other samples of different age groups.

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