Journal of Physical Education

Volume 36 – Issue (3) – 2024 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729
https://jcope.uobaghdad.edu.iq

The effect of rehabilitation exercises in improving the range of motion and muscle strength of the muscles working on both sides of the spine for women aged (30-40) years

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DOI: https://doi.org/10.37359/JOPE.V36(3)2024.2188

Article history: Received 14/ July/2024 Accepted 20/ August/2024 Available online 28/ September/2024

Abstract

The research aims to relieve pain among women members of the research sample who suffer from low back pain, improve the muscle strength of the muscles working on both sides of the spine, and improve the range of motion of the spine. The researcher used the experimental method for one experimental group using the method of pre- and post-measurements as an experimental design due to its suitability to the nature and purpose of the research. Then The research sample was chosen intentionally from women with lower back pain, numbering (14) whose ages ranged between (30-40) years. Also, a number of (4) cases were randomly selected from the research community and outside the basic sample as an exploratory sample. The researcher used a rehabilitation program. Proposed for six weeks, the following results were reached:

The use of various methods and methods helps to achieve a greater rate of improvement and in less time and cost. In light of this, the researcher recommends:

Spreading awareness and culture among community members about paying attention to early detection of lower back pain to prevent the injury from worsening to advanced degrees.

The research aims to reduce pain among women members of the research sample who suffer from lower back pain, improve the muscle strength of the muscles working on both sides of the spine, and improve the range of motion of the spine. The researcher used the experimental method for one experimental group using the pre- and post-measurement method as an experimental design due to its suitability to the nature and purpose of the research., The research sample was chosen intentionally from (14) women with lower back pain whose ages ranged between (30-40) years. Also, a number of (4) cases were randomly

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
https://jcope.uobaghdad.edu.iq

selected from the research community and outside the basic sample as an exploratory sample. The researcher proposed a six-week rehabilitation program. The following results were reached:

- The rehabilitation program has a positive effect on the injured members of the experimental group.

-The use of various methods and methods in the rehabilitation program, such as a physical therapy program, helps to achieve a greater rate of improvement and at a lower time and cost. In light of this, the researcher recommends: - Spreading awareness and culture among community members about paying attention to early detection of cases of lower back pain to prevent the injury from escalating to advanced degrees.

Keywords: rehabilitation, internal ligament, football

Introduction:

After the spine, the main support of the human body, it is one of the areas most exposed to stress, especially in its most mobile parts, such as the lumbar region, where sudden movements, accidents, weight gain, and incorrect exercises, etc., result in what are called lower back injuries, where lower back pain occurs. Back pain is among the most common reasons for visits to health care centers. Pain is usually caused by problems in the musculoskeletal system, especially the spine. Low back pain becomes more common as people age, and it is one of the most expensive conditions in terms of health care payments and disability payments. And wasting work time. The problem of the research lies in the high percentage of people suffering from chronic lower back pain from which many suffer, and the negative effects of this pain in the aspects of their working, health and psychological lives. These pains affect their movements and the failure to carry out their work and daily activities, as well as the spread of the phenomenon of random, unstudied treatments and their impact. And its side effects on those affected. The research aims to prepare therapeutic exercises to relieve lower back pain. It was found that there were statistically significant differences between the average of the pre- and post-tests of the experimental research group in the effect of the proposed exercises on the muscular strength of the muscles working on both sides of the spine and the range of motion of the spine for the individuals in the research sample, and for the benefit of the post-test. In this field, some similar studies were conducted, including the study of (Anam Majeed Al-Najjar).) which aimed to prepare three different programs and find out which of the three programs has the advantage in rehabilitating patients with chronic lower back pain, as the sample amounted to (30) patients whose ages ranged between (25-45) years. The researcher found that there were significant differences between the pre- and post-tests for some variables. Physical and electrophysiological studies of the gynecological nerve supplying

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Volume 36 – Issue (3) – 2024 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729
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pain to the lower extremities. As for the study of Dr. Baida Razzaq Jawad (2017), the study aimed to prepare rehabilitation exercises and medical devices accompanied by a nutritional program for women suffering from a herniated disc. The researcher concluded that there was a noticeable improvement in the weight loss of the majority of the affected women, and this confirms the effectiveness of the nutritional program and also the operation of the stimulation device consisting of negative and positive electrodes. On local stimulation through the passage of intermittent and continuous current over the affected area, which in turn prepares and stimulates the exercise

The anti-gravity walking device is a technology that enables the injured to move in new ways and without pain to regain the ability to move and improve skill, motor and physical performance (Fadel & Kadem, 2021), as it allows the injured to move without restriction or pain to restore and build muscle strength, movement, balance and physical fitness. It also grants a high degree of intensive and early rehabilitation for those suffering from knee joint injuries. (Easa et al., 2022)

Rehabilitation programs have recently received great attention in increasing the number of research, as well as specialized scientific books that seek to benefit from the results of scientific studies and research. Many researchers and specialists in the field of sports medicine have addressed in their studies the issue of preparing rehabilitation programs according to the severity and severity of the injury. (Mahmood & Kadhim, 202)

Through the experience and work of researchers in sports rehabilitation, they noticed that many players suffer injuries that tear internal ligaments and take long periods of treatment, which affects the player's physical and skill level, in addition to the lack of scientific research on this injury, which has spread widely among players, which prompted the researcher to find solutions and a program. Preparing for this injury, then developing an intensive program to strengthen the muscles working in the knee joint and creating a physical program to return the player to the field as quickly as possible. (Kzar & Kadhim, 2020)

The researchers decided to study this problem by preparing a rehabilitation program to restore the functional efficiency of the muscles working on the knee joint after the rupture of the internal ligament for football players.

The researchers also want this study to be a starting point for other researchers to address other, more common injuries among football players.

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
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Method and tools:

The researcher adopted the experimental method for one experimental group using the pre- and post-test method as an experimental design due to its suitability to the nature of the research. The research population was chosen from the Julnar Fitness Hall for Women located in Baghdad Governorate, next to Al-Karkh, Al-Jawadin District, and they numbered (14) whose ages ranged between (30- 40) years, where a person was chosen intentionally to achieve the research objectives and reach the required results. Also, a number of (4) cases were randomly selected from the research community and outside the basic sample as an exploratory sample. Table (1) shows the distribution of the research sample and its percentage:

Table (1) Description of the study population

the society	Total community		The research sample			
			Exploratory sample		Basic sample	
	the number	%	the number	%	the number	%
Sufferers of lower back pain	**14**	**100,00**	**4**	**28,57**	**10**	**71,43**

Then the researcher found homogeneity among the individuals in the research sample in each of the following variables:

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
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Table (2): The arithmetic mean, the average standard deviation, and the skewness coefficient for the individuals in the research sample (basic, Exploratory variables (anthropometric - physical - motor range).

Variables	measruing unit	SMA	Mediator	standard deviation	Flatness	Skewness
the age	the year	59.93	59.50	2.67	0.79-	0.34
Height	right	168.21	168.50	3.02	0.87-	0.20-
the weight	kg	96.64	96.00	11.14	0.92-	0.25
BML	kg/m2	34.09	34.53	3.163	0.78-	0.05-
Back muscle strength	kg	16.00	16.00	1.71	0.55-	0.65
Bend the torso forward	degree	45.14	44.00	3.35	0.44-	0,89
The torso is arched backwards	degree	25.00	25.00	1.11	0.61-	0.79

It is clear from Table (2) the homogeneity of the members of the research sample (basic - exploratory) in all anthropometric, physical, and motor range variables, where the skewness coefficient ranged from (3), which indicates the homogeneity of the members of the research sample.

Devices and tools used

- Interview
- Registration and data dumping form
- Restameter device for measuring length
- A medical scale to measure weight
- Tape measure to measure flexibility
- Dynamo meter device for measuring muscle strength
- Stop Watch
- gym
- Whistle

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Exploratory experience:

The exploratory study was conducted on (12/10/2023) on a sample of (4) female participants from outside the main sample and from within the research community

Pre-test:

The pre-test was conducted on the research sample on (12/18/2023) in the Julnar FitnessHall.

Basic experience:

The researcher applied the exercises to the research sample in the period from (12/23/2023) for a period of (6) weeks at a rate of (3) units per week on the basic research sample.

Posttest:

The researcher conducted post-tests on members of the basic research sample on all research variables On the date (7/2/2024).

Statistical processing:

The researcher used statistical software packages for the social and human sciences (Spas).

Discussing the results:

- Results of the first hypothesis:

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Table (3) Significance of differences between the average of pre- and post-tests for sample members in the variables "muscular strength of the muscles working on both sides of the spine"

Variable	measruing unit	Tribal measurements		Dimensional measurements		The difference between the two averages	Calculated t value	Improvement rate %
		Q	A	Q	A			
Back muscle strength	kg	16.50	1.72	20.00	2.21	3.50	3.75	21.21

Tabulated "t" value at degree of freedom (8) and significance level (0.05) = 2.306

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
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Results of the second hypothesis:

Table (4)The significance of the differences between the average of the pre- and post-tests of the sample members in the variables of "spine range of motion"

Variable	measr uing unit	Tribal measurements		Dimensional measurements		The differenc e between the two averages	Calculat ed t value	Improve ment rate %
		Q	A	Q	A			
Bend the torso forward	degree	46.10	3.51	93.50	2.01	47.40	35.14	102.82
Torso arched backwards	degree	25.30	1.16	26.50	0.99	1.600	3.14	6.32

Tabulated "t" value at degree of freedom (8) and significance level (0.05) = 2.306

It is clear from Table No. (3) that there are statistically significant differences between the pre- and post-tests, the experimental research group, in the effect of the proposed exercises on the strength of the muscles working on both sides of the spine of the sample members under study, in favor of the post-test, and the researcher confirms the positive improvement in the results of the post-test for the muscle strength variables in the group. There was also a noticeable improvement in the amount of muscle strength of the experimental group, as well as the correct upward progression that is appropriate to the nature of the disease condition, as room was available for practicing exercises throughout the treatment period on all muscle groups, and this is consistent with the study of Sarah Diani et al., Maryam Al-Sayed (2004), Mustafa Ibrahim Ahmed (2004), where the results of their study proved that there was a noticeable improvement in the average percentages of the pre-post tests in favor of the experimental group compared to the control group in the muscle strength tests for the muscle groups concerned with the study of each of them as a result of the experimental group practicing the exercises of the rehabilitation programs under study.

As for the results of Table (4), there are statistically significant differences between the pre- and post-tests for the individuals of the sample under research in the effect of the proposed exercises on the range of motion of the spine (for the individuals of the sample under research and in favor of the post-test. Here, the researcher confirms the improvement in most of the post-tests of the range of motion variables for the group. Experimental research: This improvement is due to the different levels of exercise in their effect on the range of motion of the spine, taking into account in its implementation the degree and nature of the rehabilitation stage using a varied method, and this agrees with all of Zayou

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
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and Feng (1997AD), Abdel Halim Okasha (1999AD), and Dolan (2000AD).), Hamdi Gouda Al-Qalioubi (2004), where the results of their study proved that there are significant differences for the experimental group over the control group in tests of range of motion and joint flexibility as a result of using and practicing a rehabilitation program that leads to improvement in the range of motion of the spine and reduces muscle tension and thus reduces pain. Resulting from lower back injuries

This is consistent with the studies of Amr Ahmed Khalil (2008), Muhammad Al-Najjar (2016), Mustafa Taher (2015), Tariq Muhammad Sadiq (2014), and Naseer Jamal Muhammad (2009), which indicate that using a rehabilitation program and exercises improves motor range. For athletes and non-athletes. Through the previous presentation and scientific analysis of the statistical tables, Table No. (6), it is clear that the first hypothesis has been fulfilled, which states that there are statistically significant differences between the two pre- and post-measurements in the functional efficiency of the muscles working on the knee joint after the rupture of the internal ligament for football players, in favor of the post-measurement. On the motor range. (Abed et al., 2022)

Discussion of the results of the second hypothesis: It is clear from Table (5) that there are statistically significant differences between the pre- and post-measurements of the sample in favor of the post-measurement. The tabular t-value is at a significant level (0.05=1.895). It is clear from Table (5) that the significance of the statistical differences is at a significant level (0.0001) between the pre and post measurements for the research group in tests of variables that include the motor balance of the knee joint. The calculated T value ranged between (16.52 = 18.75) (Taha & Khalif, 2022(

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
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It is clear from Table No. (6) that the percentages of improvement between the pre- and post-measurements in the variables of knee joint balance for the sample ranged between (20.05%-25.67%). This is consistent with the studies of Muhammad Al-Najjar (2016), Hani Abdel Aleem (2012), Wael Fouad Abdel Ghani (2007), and Naseer Jamal Muhammad (2009), which indicate that the rehabilitation program and qualifying exercises improve the players 'balance, through previous presentation and scientific analysis of the tables. Statistics: It is clear that the second hypothesis, which states that there are statistically significant differences between the two measurements (pre-post) in the functional efficiency of the muscles working on the knee joint after the rupture of the internal ligament for football players, is in favor of the post-measurement on balance. (Kadhim & Mousa, 2024(

Discussion of the results of the third hypothesis: It is clear from Table No. (7) for measuring the muscular strength of the muscles working on the knee joint, where it is clear that there are statistically significant differences between the pre- and post-measurements of the sample in favor of the post-measurement. The value of the tabular t is at a significance level (0.05 = 1.895). Table (7) shows the significance of the statistical differences at a significance level of 0.0001 between the pre and post measurements for the research group in tests of variables that include electromyography measurements on the muscles working on the anterior-posterior knee joint. Macrophages - calves. The calculated T value ranged between (9.02-12.74). (Kadhim & Mahmood, 2023)

It is clear from Table No. (8) that the percentages of improvement between the pre- and post-measurements in the electromyography variables on the muscles working on the knee joint for the sample ranged between (63.33%-49.28%). Escobar et al. at et Escobar (2007) indicate that the development of muscle strength takes place. By choosing the exercises that are performed during the proposed training program to achieve better results for developing muscular strength. (: (85)(Kadhim & Mousa, 2024)

Abu Al-Al Abdel Fattah and Ahmed Nasr (2003 AD) confirm that the quality of a muscle can be identified by knowing the extent of what it can carry or the degree of endurance on it, as well as the amount of work it produces

This agrees with Gill et al., 2008 AD) that performing regular exercises for maximum strength due to the building of a greater number of muscle fibers (myofibrils) and causes hypertrophy in working muscle cells (Ibrahim et al., 2006), and the increased pressure also causes a positive result in growth. Ligaments and bones

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
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Conclusions and recommendations:

1-Conclusions:

Through the research objectives and hypotheses, and according to what was indicated by the statistical treatments and in light of the presentation Discussing the results and within the limits of the research sample, it was possible to reach the following conclusions:

(1) Rehabilitation exercises have a positive effect on injured members of the experimental group in:

- Balanced development of the strength of the muscle groups working on both sides of the spine...

- Increase the range of motion of the spine.

(2) The balanced development of muscle strength, joint flexibility, and muscle elongation has an important effect in increasing the motor efficiency of the vertebrae in the lumbar region.

(3) The variety in the use of flexibility exercises, muscle stretching and muscle strength exercises had a positive impact on improving the functional performance of the spine.

(4) Using various methods and methods helps to achieve a greater rate of improvement and at a lower time and cost.

2- Recommendations:

Based on the conclusions reached by the researcher and within the limits of the research sample, the researcher recommends the following:

(1) Be guided by rehabilitative exercises and generalize their use in treatment centers, institutions, and hospitals

(2) Spreading cultural awareness among community members towards paying attention to early detection of lower back injuries to prevent the injury from escalating to an advanced degree.

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P-ISSN: 2073-6452, E-ISSN: 2707-5729
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