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Effect of lengthening exercises in relieving lower back pain in men aged 40-50 years

تأثير تمرينات الإطالة في تخفيف ألآم أسفل الظهر لدى الرجال من 40 - 50 عاماً.

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Abstract: The objective of the study is to identify " effect of lengthening exercises on relieving lower back pain (motor range of torso, muscle strength abdomen and back, score of pain) in men aged 40-50 years", to achieve this, the researchers used the pilot curriculum to fit it and the nature of the study, Using the pre- and post-tests of a single experimental group, with its own (6) men, They were chosen in a deliberate manner, adhering to lengthening exercises and for (6) weeks, 5 qualifying sessions per week. The results of the research have found statistically significant differences between pre- and post- tests and for the benefit of post- tests in study variables, researchers recommended that lengthening exercises should continue to relieve lower back pain.

Keywords: Lengthening exercises– Lower back pain – Motor range.

الملخص : هدفت الدراسة التعرف إلى "تأثير تمرينات الاطالة في تخفيف ألآم أسفل الظهر (المدى الحركي للجذع، قوة عضلات البطن والظهر، درجة الألم) لدى الرجال من 40 - 50 عاماً"، ولتحقيق ذلك استخدم الباحث المنهج التجريبي لملاءمته وطبيعة الدراسة، باستخدام القياس القبلي والبعدي للمجموعة التجريبية الواحدة، على عينه قوامها (6) رجال، تم اختيارهم بالطريقة العمدية، حيث التزموا بتمارين الإطالة لمدة (6) أسابيع، بواقع (5) جلسات تأهيلية في الأسبوع الواحد، وقد توصلت نتائج الدراسة إلى وجود فروق ذات دلالة إحصائية بين القياسين القبلي والبعدي ولصالح القياس البعدي في متغيرات الدراسة، وأوصى الباحث بضرورة الاستمرار في تمرينات الاطالة لتخفيف الآم أسفل الظهر.

- **الكلمات المفتاحية:** - تمرينات الإطالة – ألام أسفل الظهر – المدى الحركي.

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Introduction & Problem of the Study

As a result of the scientific Progress That Our world is witnessing in the Twenty-first century in varions Fields of science and life, physical education has become closely linked to many sciences, especially sports medicine, physical therapy, and motor rehabilitation, which Play an important roule in studying, treating, and Prevention injuries.

Since life includes many physical and psychological pressures resulting from the responsibilities and burdens of daily life, it represents a great burden on the muscles, bones and other parts of the body, which can directly affect the shape of the body and lead to lower back pain (**cash, 2009**).

The problem of lower back pain is one of the common problems nowadays, as it constitutes the largest cause of disability under the age of forty

(**Rydeard et al, 2006**).

Between 70-80% of adults are infected at least once in their lives, and its prevalence increases at the age of fifty (**Arumugam, 2012**).

Low back pain is considered the most common musculoskeletal condition that affects an individual's quality of life, especially the wrong approach over long periods of time work is being done to establish treatment programs to be good in an attempt to reduce the negative impact on low back pain and help affected cases recover and maintain a quality of life, Be better (**Henry et al, 2005**).

The problem of lower back pain is considered one of the most common problems among diseases of the musculoskeletal system, in Europe, for example, according to the World Health Organization, 60% of disability resulting from work is due to problems of the musculoskeletal system, and the prevalence of lower back pain ranges from 60-25% of this percentage

(**Shiri et al, 2012**).

In Australia, the problem of lower back pain is one of the most common diseases that occur to the musculoskeletal system and the seventh most common disease affecting Australian society (**Machado et al, 2005**).

Stretching exercises are considered one of the most important axes that aim to remove defects in the affected part and pay attention to manifestations of weakness in some muscles, ligaments and joints (**عثمان، 2014**).

Stretching exercises are considered the mainstay in treating many injuries, including lower back pain, as many sources indicate that lower back pain is the most common injury, and the incidence of lower back pain increases in people who maintain incorrect positions for a long time (**خليل، 2008**).

Stretching exercises are also an effective therapeutic method in treating lower back pain in particular, and evidence of the advancement of the level of medical and sports services (**لخضر وأمين، 2013**).

Riyad and Abdulrahim (2001) emphasized the importance of stretching exercises in alleviating pain as well as strengthening the muscles working on the injury area.

Al-Sharafi (2024) points out that stretching exercises based on codified scientific foundations are an effective therapeutic method in treating many cases that suffer from chronic injuries in the body.

Through the researcher's contact with society, he noticed that there are many wrong habits and positions among many men, such as the habits of sitting for long periods while watching television and mobile phones, as well as during office work, in addition to the lack of organized and sufficient motor activity, and this in turn, according to the researcher's belief, has led to many contemporary diseases, including: Foremost among them is lower back pain, lack of muscle flexibility, and weakness, especially the lower back, this health problem has spread widely recently Especially in the elderly.

The financial costs of treating such cases are rather high when compared to the individual's income, in addition to the large amount of time required for them to go to expensive rehabilitation centers, and from here the problem arose in developing rehabilitation exercises, especially stretching them, because of their positive effect, in relieving pain and strengthening the muscles working in the back and abdomen area, which plays an important role in the recovery process without costs.

This is what prompted the researcher to conduct this study by proposing a set of stretching exercises in a scientific research method based on scientific foundations and based on references, scientific studies, and the opinion of specialized experts, which highlights the role of specialists from colleges of physical education in this field.

Importance of the Study

The scientific importance of the study lies in:

1- Introducing men to the importance of exercise and adopting proper body positions.

2- Educating the community about the role of the College of Physical Education in preparing and rehabilitating many injuries and diseases, including lower back pain.

The applied importance of the study is:

1- Conducting exercises that are accessible to society in its various segments, based on codified scientific foundations.

2- Focus stretching exercises on relieving lower back pain.

3- Developing rehabilitation methods by building future rehabilitation programs that work to find radical solutions to many problems.

Aim of the Study

The study aimed to identify the effect of stretching exercises in relieving lower back pain, (motor range of the torso (anterior flexion, posterior curvature, right side tilt, left side tilt), muscular strength of (abdomen and back), score of pain), in men aged 40-50 years.

Hypothesis of the Study

There are statistically significant differences between the pre- and post-tests, for the post-tests is in favor of the study sample using lengthening exercises to relieve lower back pain, (motor range of the torso (anterior flexion, posterior curvature, right side tilt, left side tilt), muscular strength of (abdomen and back), score of pain), in men aged 40-50 years.

Fields of the Study

Humanitarian Field

Men with low back pain from 40 - 50 years.

Place Field

Sana'a University campus.

Time Field

From 12/07/2024 until 01/15/2025.

Terms of Study

Rehabilitation Exercises

It is a set of organized physical movements that are applied in the air, water, or using devices for scientific and medical reasons with the aim of restoring lost normal functions (**سامي وعبد الهادي،2010**).

Lower Back Pain

These are the pains that occur as a result of tension or muscle contraction when this is exposed to excessive effort to a state in which the muscles are unable to

bear this situation and react with contraction and contraction, which in turn puts pressure on the sensory nerves that conduct the pain (**John,2002**).

Stretching Exercises

They are exercises that lengthen the muscle well and quickly, and are considered one of the most important exercises that must be practiced during the muscle building period to protect the body from injuries, tears, and muscle tension (**السيد،2002**).

Method

The researcher used the experimental method using pre-post measurement for the single experimental group, due to its suitability to the nature of the study.

Sample

The study sample consisted of (6) men suffering from lower back pain, who were selected intentionally, and their ages ranged between 50-40 years.

Conditions for selecting the sample:

The study sample of men with low back pain was selected according to the following conditions:

1- He must be suffering from lower back pain.
2- The affected individual should not practice any other therapeutic methods while performing exercises.
3- Availability of the desire to participate in the study experience.
4- Exclude men who have body deformities due to injury such as (osteoporosis – varicose veins – tumors...).

Homogeneity of the study sample

Homogeneity was found among the 6 members of the study sample at the beginning of the exercise application in measurements of height, age, weight, torso motor range (anterior flexion, posterior curvature, right side tilt, left side tilt), muscle strength of (abdomen, back), degree of injury, duration Injury

Table 1: Arithmetic mean, standard deviation, median and Skewness coefficient of homogeneity of the individuals of the study sample N=6

N	variable	unit	Mean	standard deviation	Median	Skewness
1	Long	cm	154.83	1.95	154.50	0.84
2	Age	year	36	3.66	36	-0.94
3	weight	kg	58.67	8.59	56.50	1.71
4	Motor range of the trunk (Bend forward)	cm	4.17	2.40	3.50	0.23
5	Motor range of the trunk (Bend back)	cm	55.33	3.20	55	1.19
6	Motor range of the trunk (right side)	cm	42.83	10.21	43	-0.11
7	Motor range of the trunk (left side)	cm	34	5.80	36	-0.84
8	core strength	kg	6.16	2.87	6.41	-0.61
9	Back muscle strength	kg	5.62	1.84	5.08	0.85
10	degree of infection	score	4.17	1.17	4	0.67
11	Duration of infection	year	5.33	1.03	5	0.67

It is clear from Table (1) the homogeneity of the sample members in the study variables, as the values Skewness coefficient were between (+3, -3), meaning that there is homogeneity among the study sample in the variables under study, which indicates that the scores were moderately distributed in the variables.

Instruments and devices used in the study

Table (2): Tools and devices used by the researcher

NO	device name	manufacture	Purpose of use	method of use	photo
1	Dynamo meter	Chinese	Measure the strength of the abdominal and back muscles	The device is tied with a band on the waist, then the injured person alternately pushes the pelvis forward and backward and records a number on the device screen	
2	ruler	Chinese	Measuring motor range	The ruler is fixed from below on the ground next to the foot, and the process of bending down is done on a table to touch the lowest possible point next to the ruler and read the cursor	
3	Medicine Ball	Chinese	Strengthening the lower back muscles	It is placed on the knees, then the injured person presses it with the knees and thighs	
4	rest meter	Chinese	measure length	The one end of the meter is fixed on the top of the head and the other end is fixed on the bottom of the foot, and the measurement is taken	
5	Medical balance M30	Chinese	weigh-in	The affected person stands on the scale and the reading are taken in kilograms	

Pilot Study

The prospective study serves as the essential basis for building the entire research, it is an initial experimental study conducted by the researcher on a small sample with the aim of testing his research methods

(التكريتي والعبيدي، 1999).

Exercises were applied to the study sample of (6) men with low back pain on 30/11/2024 for the purpose of:

1- Ensure the validity and efficiency of the tools and devices used in the study.
2- Knowing the efficiency and readiness of the assistant team.
3- Suitability of lengthening exercises for the study sample.
4- Knowing the appropriate time to implement the proposed exercise units.

Rehabilitation exercises (lengthening)

lengthening exercise design

The researcher designed the exercises based on reference studies and scientific research, where the exercises were presented to experts who specialize in physical therapy and motor rehabilitation, and after making adjustments according to the opinions of the experts, the proposed exercises were put in their final, applicable form, as the exercises in their final form contained 6 weeks of 5 sessions, the duration of each session is 40 – 60 minutes, and the intensity was calculated based on the law of intensity based on repetitions.

Target intensity = maximum number of repetitions × target intensity/100

Program Point

Table (3): Basic determinants of the proposed exercises, dates of the exploratory study, and pre- and post-tests.

O Z	Number of group members	group description	Pilot study date	Primary date	Final date	Basic determinants of the program					
						Beginning of the exercise application	Duration of Exercises	number of sessions	Session time	stages	Number of sessions in each stage
1	6	lengthening exercises	2024/11/30م	2024/12/02م	2025/01/18م	2024/12/07م	6 weeks	5 sessions per week for an average of 30 sessions	60 -40 minute	3 stages	10 sessions

Program Point

Table (4): Stages of applying lengthening exercises

Exercise name	stage	Number of sessions per week	Total number of units	Quantifying session time	Target Intensity %	Unit parts and time			Stage goal
						parts	Exercise size	Total size	
lengthenin g exercises	first	5	10	40 minute	60%	warm-up exercises	5 minute	40 minute	1- Activating the circulatory

Exercise name	stage	Number of sessions per week	Total number of units	Qualifying session time	Target Intensity %	Unit parts and time			Stage goal
						parts	Exercise size	Total size	
						Qualifying exercises	30 minute		system 2- Preparing muscles for physical exertion
						Calming Exercises	5 minute		
	second	5	10	50 minute	70%	warm-up exercises	5 minute	50 minute	3- Improve range of motion 4- pain relief
						Qualifying exercises	42 minute		
						Calming Exercises	3 minute		
	third	5	10	60 minute	80%	warm-up exercises	5 minute	60 minute	5- Increase motor range 6- Strengthen targeted muscles
						Qualifying exercises	51 minute		
						Calming Exercises	4 minute		

Study Variables

Independent Variable

lengthening exercises

Dependent Variable

Motor range of the torso (anterior flexion, posterior curvature, right side tilt, left side tilt), muscle strength of (abdomen, back), score of pain.

Statistical Processing

1- Mean.
2- Standard deviation.
3- Median.
4- Skewness.
5- improvement rate.
6- T- test.

Present and discuss the results

Based on the objective and purpose of the study, the researcher presented the results in the form of tables and figures that were arrived at after statistical processing.

Presentation of the results of the study hypothesis

For the purpose of verifying the results of the study hypothesis, which states that "there are statistically significant differences between the pre- and post-measurements and in favor of the post-measurement in the study sample using lengthening exercises to relieve lower back pain in men aged 40-50 years." The researcher used the arithmetic mean, standard deviation, and level of improvement, and he also used the T-test due to its suitability to the study and the moderation of the data, in order to identify the significance of the differences between the pre- and post-tests in the study sample, and Table (5) and Figures (1) and (2) illustrate this.

Table (5): The significance of the differences between the averages of the pre- and post-tests using lengthening exercises in the variables of the motor range of the torso (anterior flexion, posterior curvature, right side tilt, left), muscle strength of the muscles (abdomen, back), and score of pain. N=6

variable		Unit	tests	Mean	Standard deviation	improvement % t	(T) test	significance level	Verbal connotation
motor range of the torso	anterior flexion	score	Pre-tests	11.67	2.66	-179.86	9.30	.000	function
			Post-tests	4.17	2.40				
	posterior curvature	score	Pre-tests	55.33	3.20	-12	5.20	.003	function
			Post-tests	49.33	1.21				
	right side tilt	score	Pre-tests	42.83	10.21	-42	3.56	0.016	function
			Post-tests	30.17	7.33				
	left side tilt	score	Pre-tests	34.00	5.79	-22	10.26	.000	function
			Post-tests	27.83	4.45				
muscle strength	core strength	score	Pre-tests	6.16	2.87	48	-7.33	.001	function
			Post-tests	11.96	1.85				
	Back muscle strength	score	Pre-tests	5.62	1.84	50	-3.24	.023	function
			Post-tests	11.29	3.96				
Pain	pain score	score	Pre-tests	4.17	1.17	-402	6.74	.001	function
			Post-tests	0.83	0.75				

Significance level (0.05)

Figure (1): The difference between the averages of the pre- and post-tests using lengthening exercises for the variables of the motor range of the torso (anterior flexion, posterior curvature, right side tilt, left), muscle strength of the muscles (abdomen, back), and score of pain.

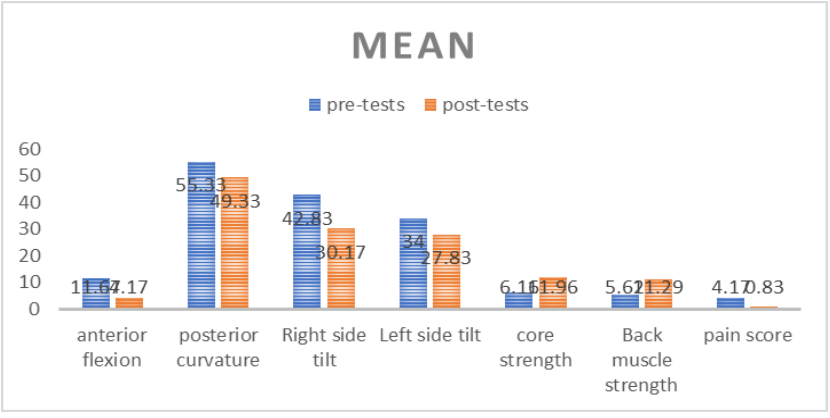
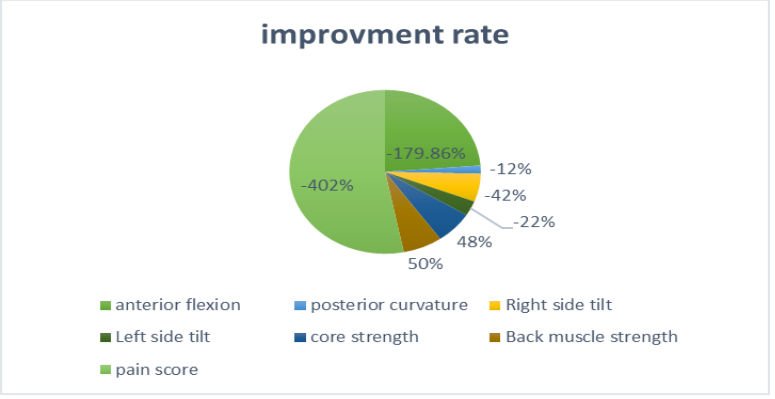


Figure (2): The percentage of improvement using lengthening exercises for the variables of torso motor range (anterior flexion, posterior curvature, right side tilt, left), muscle strength of the muscles (abdomen, back), and score of pain.



It is clear from Table (5) and Figure (1) that there are statistically significant differences between the pre- and post-tests in favor of the post-tests in the variables of the motor range of the torso (anterior flexion, posterior curvature, inclination of the right side tilt, to the left side), the muscular strength of the

muscles (abdomen, back), and the score of pain, where the value (T) calculated for bending the torso forward ranged from 9.30 While the calculated value of (T) for bending the trunk backwards was 5.20 and the trunk tilt for the right side was 3.56, the calculated value of (T) for the trunk tilt for the left side was 10.26, which is less than the significance level (0.05) and is all statistically significant.

The calculated value of (T) for the muscular strength of the abdominal muscles was -7.33 and the muscular strength of the back muscles was 3.24, all of which are below the significance level (0.05), meaning that they are statistically significant.

Also, the calculated value of (T) for the score of pain was 6.75, which is lower than the significance level (0.05), meaning that it is statistically significant. The highest improvement rate was for the degree of pain variable, at -402%, and the lowest improvement rate was for the trunk flexion variable, at -12%. Figure (2) shows this.

discussing results

Discussion the results of the study hypothesis, which stated that "There are statistically signifiant differences between the pre- and post-tests, and in favor of the post-tests in the study sample using lengthening exercices to relieve lower back pain in men aged 40-50 years.

Table (5) shows that there are statistically significant differences between the pre- and post-tests and in favor of the post-tests in the variables of the motor range of the torso (anterior flexion, posterior curvature, right-side tilt, left), muscle strength of the muscles (abdomen, back), and score of pain.

The researcher attributes these differences to the exercises used, in which the progression of exercises was taken into account and in a manner that was appropriate to the medical condition of the sample members, and in what the exercises contained of standardized stretching exercises. This is what **Colt, 2003,**

emphasized, that rehabilitation exercises in general and stretching in particular are the basic pillar in removing lower back pain resulting from muscle weakness, as these exercises work to strengthen it and increase the flexibility of the joints working on it also works to develop and enhance muscle strength, joint flexibility, and the degree of neuromuscular coordination until the affected individual regains his normal state of body balance and performs the duties of his daily life.

Many researchers, such as **Micheel (2003), William (2005), Thomas & Narvain (2006)** agree that the success of the rehabilitation process lies in the correct construction of exercises aimed at restoring motor range and muscle function and reducing the exacerbation of pain.

Slater (2006) and Richard & Wilson (2007) agree that lengthening exercises are an important way to speed up the injured person's return to normal or closer to normal.

Hubley (2002, Hubley) points out the effective effect of stretching exercises in reducing lower back pain.

James et al (2009) state that stretching exercises protect the joint and its surrounding ligaments and restore the full range of motion of the joint.

Tawfiq (2005) confirms that stretching exercises have effects on various body systems (increasing joint movement – increasing muscle and ligament elasticity – strengthening weak muscles – balance and functional training).

Jafar (2011) stressed the need to pay attention to massage as it contributes to preparing the affected muscles, as massage raises the temperature of the area affected by pain in addition to getting rid of muscle waste.

This is consistent with the words of **Cook and Siddiq (2013)** that standardized exercises are one of the basic means of treating the problem of lower back pain,

and they also represent special importance in the field of rehabilitation, especially in its initial stages, as they work to remove lower pain.

The researcher was able to reach those suffering from lower back pain under study through lengthening exercises to advanced levels in the range of motion of the trunk, as well as reducing the level of pain that the sample members had, within a short period of applying the exercises, which indicated the importance of applying these exercises in the daily lives of those suffering from such pain, which works to improve their standard of living during daily and office work.

conclusions and recommendations

conclusion

In light of the results of the study that was presented, the researcher concluded the following:

1- Lengthening exercises increased the range of motion of the torso (anterior flexion, posterior curvature, right side tilt, left).
2- Lengthening exercises increased the muscular strength of the muscles (abdomen and back).
3- Lengthening exercises relieved the pain in the lower back area.

Recommendations

In light of the previous conclusions, the researcher recommends the following:

1- Pay attention to lengthening exercises as an effective treatment method to relieve lower back pain.
2- Apply lengthening exercises immediately after the injury and before the condition develops and reaches the stage of a herniated disc.
3- Educating the community about the importance of the role of lengthening exercises as a means of alleviating lower back pain.
4- Introducing community members to healthy body positions when performing daily life tasks.

5- Disseminate the results of this study to the relevant authorities.

6- Conduct similar studies on a larger eye than those with lower back pain for a longer period of time.

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