

The effect of rehabilitative exercises according to some kinematic variables in relieving lower back pain for women aged 25-35 old

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Abstract

The purpose of this paper is to preparing exercises according to some biomechanical variables for women with low back pain and identifying the effect of exercise according to some biomechanical variables and relieving lower back pain for women. The researchers used the one-group experimental design. the sample was chosen by the intentional method to provide the necessary conditions for conducting the study, and they represent the research community and its sample. The researchers also excluded (2) of the injured women because they did not adhere to the rehabilitation sessions, and for the purpose of ensuring the homogeneity of the sample members, the researchers used the arithmetic mean, standard deviation, and the torsion coefficient of the results of the field survey in measurements (age, mass, and length). He ages of the research sample ranged between (25-35) years of those who had the injury within a period of time from (one month to six months) (from the date of the injury to them) at the Medical Rehabilitation. Through displaying, analyzing and discussing the results of pre and post-tests, the two researchers concluded: The application of rehabilitation exercises to the affected sample was not left negatively, but they obtained positive effects and rapid improvement and interest in spreading health awareness of following healthy habits while sitting, sleeping, traveling for long distances, or walking or

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ascend or go down. Through the conclusions reached by the two researchers, they recommended sing rehabilitation exercises programs to develop muscle strength and flexibility of the spine, muscle lengthening exercises, preventing pain in the lower back and avoiding pain

Keywords: Lower back pain, Biomechanical, Rehabilitation exercises, sports

The research

Introduction

Therapy with rehabilitative exercises is considered one of the most effective methods of physical therapy if it is used in an organized and accurate manner, based on measuring biomechanical variables and in agreement with the dysfunction in the affected muscles, given that physical therapy depends on the histocompatibility of most body sytorsos and depends on the concepts of movement and its biomechanical laws in preparing curricula or Rehabilitation therapeutic programs to restore and renew kinetic functions and reach a pre-injury state or reduce feeling and pain. Therefore, the importance of using rehabilitative exercises has emerged widely among all segments of society to increase the positive effect of rehabilitative treatment and shorten time, or in order to invest the duplication of this effect in more than one way in order to achieve the maximum level of rehabilitation for the injured to lead their normal life.

Most women at the age of (25-35) years suffer from lower back pain due to several causes, and this pain is not usually associated with herniated discs, as the causes are weakness in the muscles that lead to the occurrence of pain, and since the muscles extend along the body according to the anatomical sites, as the spine will begin to Work with greater effort, which causes shortening and tightening, and they may find themselves when tilting the pelvis forward at a great risk of developing acute or chronic low back pain, and poor coordination of contractions for this muscle group leads to a state of instability of balance or the availability of a high possibility of injury, and even may It leads to severe or chronic lower back pain, and this pain must be of importance in its study in sports rehabilitation in order to provide support and assistance to therapists in rehabilitation centers in terms of accelerating

the process of recovery by strengthening the harmonics and contractions of the synergy of muscular work for the purpose of providing the element of protection for the most important pillars of the body and through clear The importance of the study through finding rehabilitative exercises or reducing the injury of women with lower back pain, which is one of the common injuries among a large segment of women in society.

Long-term inactivity can lead to muscle imbalance, causing pain in various areas. This can be due to factors like sitting, watching TV, using electronic devices, or wrong standing. Strengthening muscles requires the principle of exchange and diversification of movements, targeting most muscles of the body. Therapists often use isolating muscle groups to target and strengthen affected areas. However, general strength is needed to strengthen the synergy of limbs and torso muscles to avoid imbalance. Academic research has shown slow recovery from lower back pain among women, highlighting the need for programs and exercises addressing mechanical variables to alleviate or cure the pain. The Research objective Preparing exercises according to some biomechanical variables for women with low back pain and Identifying the effect of exercise according to some biomechanical variables and relieving lower back pain for women.

MATERIAL & METHODS

Research Methodology:

The researchers used the one-group experimental design (Obeidat and et al. 1992), and The researchers applied rehabilitative exercises on the experimental research sample, which numbered (7) patients with lower back pain. The sample was chosen by the intentional method to provide the necessary conditions for conducting the study, and they represent the research community and its sample. The researchers also excluded (2) of the injured women because they did not adhere to the rehabilitation sessions, and for the purpose of ensuring the homogeneity of the sample members, the researchers used the arithmetic mean, standard deviation, and the torsion coefficient of the results of the field survey in measurements (age, mass, and length). The ages of the research sample ranged between (25-35) years of those who had the injury within a period of time from (one month to six months) (from the date of the injury to them) at the Medical Rehabilitation Center in Al-Rafidain College), and the degree of injury was determined, which is from The average case, and thus the sample constitutes (100%) of the selected research

community, as shown in Table No. (1)

Table (1) shows the homogeneity of the research sample

Variables	Measuring unit	Arithmetic mean	Standard deviation	Median	Skewness 3±
Age	Year	30.32	2.72	30	0.611
Body Mass Index (BMI)*	Kg	62.123	2.233	62	0.80
Length	Cm	163.643	4.231	163	0.419
Degree of injury	Medium				

Tools and references used in the research: (Arabic and foreign sources and references, magazines and periodicals, a computer (laptop) type (HP) number (A), phosphorescent markers, a video camera (Com handy/Sony), at a speed of (25) p/ Second, (2) kits, with (2) camera tripods, (Kenova) program (for kinetic analysis, Goniometer device) (Italian) made to measure the range of motion (1) medical scale (Ketecto) of Japanese manufacture, electronic stopwatch (1) Chinese-made Sport Timer, (1) rubber ropes of different lengths (Chinese-made Power Resistance), a length measuring tape.

Field research procedures:

1- Tests used in the research:

First: pain degree test (Al-Najjar. 1996):

- Purpose of the test: Determine the degree of pain
- Description of the performance: From the position of lying on the back of the injured person on the medical bed and raising the legs to the top in it, the patient is asked about the degree of pain from (10 degrees as a maximum) and the degree of (zero as a minimum). The degree of pain is determined after completing the examination of the injured person and asking him questions to answer them. According to a form prepared for this purpose.
- Unit of measurement: The degree of pain estimated by the injured person.

Second: Testing the flexibility of the torso muscles from the forward bending position: (Williams BE, Yakel JD. 2007):

- Test name: bending the torso forward from standing.
- Purpose of the test: To measure the elongation of the back muscles.
- Tools: An iron rule with a height of fifty centimeters, a solid ruler with a scale of (0-100) centimeters, and fixed perpendicular to the base so that the

number (fifty) is parallel to the surface of this ruler and the number (one hundred) is parallel to its lower edge of the base. A paper registration form.

- Procedures and conditions: The injured person stands on the base of the iron with his feet joined and fixes the fingers on the edge of the seat with his knees straight, then the injured bends the torso forward and downward to push the pointer with the tip of his fingers to the furthest distance, provided that it is fixed at the last distance it reaches for two seconds, taking into account that the torso is bent slowly, and not bent knees.

- Recording: The injured has two attempts, the best of which is scored. Unit of measurement: centimeters.

Third: Testing the flexibility of the torso muscles from the position of bending the torso backwards: (Williams BE, Yakel JD. 2007):

- Test name: torso flexion backwards from standing.

- Purpose of the test: to measure the flexibility of the posterior torso muscles.

- Tools: a leather belt, a tape measure, a paper registration form.

- Procedures and Conditions: From a standing position in front of a wall with the pelvis fixed by the belt

- The experimenter has to bend the torso backwards to the maximum extent possible, taking into account not moving the feet and steadfastness for two seconds at the last distance the tester reaches.

- Recording: The distance from the wall to the chin is measured. Each tester has two attempts to calculate the best.

- Unit of measurement: centimeters.

2- Measurement of biomechanical variables (angles):

First: The angle of bending the torso by bending forward: It is the angle confined between the line of the torso from the front and the line of the thigh.

Second: The angle of bending the torso back: It is the angle confined between the torso line and the thigh line from the back.

Third: The angle of the man's breakthrough on the right side: It is the angle between the torso line and the thigh line (from the point of the hip to the knee joint point).

The values of these angles are calculated from the beginning of the movement to the end, through the conditions that were identified and measuring the angles by the approved analysis program (Kinovea V O.8.25).

Pre-tests: The researchers conducted the pre-tests on the research sample of the date of the day, corresponding to (12/12/2022) at ten in the morning, and

the test was conducted on (7) women with lower back pain. As for the main experience: rehabilitation exercises took on a period of (6) weeks for the period from Monday (18/12/2022) to Sunday (2/2/2023), and the qualifying exercises of the experimental group (24) rehabilitation units of (3) included (3). Units per week and in general (5) rehabilitation exercises per day, exercises applied through the use of rehabilitation means and without them, and the number of exercises reached (30) exercises and the duration of each rehabilitation unit in its entirety ranges between (30-40 minutes) for the rehabilitation units, where The researchers gradually increased the repetitions (2-10) times, and a time of stability ranged in each exercise (30 sec-5 min), where the two researchers took into account the gradual in the time of stability.

Post-test: After completing the application of the qualifying program, which lasted (6) weeks, the two researchers conducted their dimensional tests on the study sample on Tuesday (4/2/2023) and the researchers approved the sequence and the same procedures that she conducted in pre-tests. As for the statistical means:

Statistical methods: The search data was processed through the Statistical Package for the Social Sciences (SPSS) (Shaker, Tuama, and Radhi 2022) (Shalan, Aboode, and Radhi 2022)

RESULTS AND DISCUSSION

Table (2) shows the values of mathematical circles, standard deviations, and the value of the calculated (T) and (Sig) the statistical significance of the results of the pre -test and post-tests for the painting index. The first subtitle opens with an introduction that presents the specific problem under study and describes the research strategy. The first subtitle opens with an introduction that presents the specific problem under study and describes the research strategy. The first subtitle opens with an introduction that presents the specific problem under study and describes the research strategy.

Tests	M	SD	arithmetic mean of difference	Standard deviation of differences	T	Sig
Pre	26.6	2.3	7.66	3.88	5.54	0.003
Post	19	1.67				

Below the level of significance (0.05) and the degree of freedom 6-1 = 5

Table (3) shows the values of mathematical circles, standard deviations, and
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the value of the calculated (T) and (Sig) and the statistical significance of the results of the pre -test and after some biometric variables.

Variables	Pre-test		Post-test		arith metic mean of differe nce	standa rd deviati on of differe nces	T	Sig	Type Sig
	M	SD	M	SD					
Bend a torso in front	59	3.61	56	3.563	3.833	0.408	23	0.000	Sig
Bend a torso in back	162	5.47	155	5.680	6.167	1.602	9.4	0.000	Sig
The leg is likely to the right side	95	6.85	101	6.833	5.333	1.633	8	0.000	Sig
The leg is likely to the left side	107	2.16	111	5.115	4.500	4.183	2.6	0.046	Non sig
A likely time for the right	1.245	0.05	1.230	0.047	0.015	0.012	3	0.030	Non sig
A likely time for the left	1.203	0.10	1.178	0.097	0.025	0.012	5	0.004	Sig

Below the level of significance (0.05) and the degree of freedom 6-1 = 5

The researchers find from Table (2) that the moral difference here goes towards the post -test and in favor of the less value, that is, in the sense of approaching the value from the minimum (10) of the recorded pain index through the pain scale, which indicates that the least degree of pain is (10) and the highest degree of feeling With pain, it is (50), which at the time is the pain that is hindered to practice or carry any kinetic activity .

The two researchers find here that this result expresses a noticeable improvement in the case of the sample, especially since the axis of the work is all flowing into the sample of feeling the pain of the lower back in particular and the muscles in general and returning individuals to their previous normal state of practicing their normal lives. This is consistent with (Rania Moayad and Mona Talib), as they indicate that the codified movement treatment is one of the basic means in the field of integrated treatment of injuries, and sports therapy is a special importance in the field of rehabilitation, especially in its final stages when carrying out work treatment in preparation for the preparation for the practice of his specialized activity (Al-Hijazi, & Dr. Abeer Dakhil. 2021).

And that the exercise of physical exercises and for various ages with the aim of public health and gaining physical fitness must be based on scientific foundations, not arbitrary and random, and causes a low level of physical fitness in many and for various groups of society, and this in turn exacerbates physical problems and thus the occurrence of injury ,(Ibraheem, & Dr. Muna Talib Al-badry. 2022)

One of the most likely injuries is the lower back pain due to the weakness of the muscles associated with the spine and its inability to endure, and the flexibility of the muscles has an effective role in avoiding the injury, and it is worth noting that dealing in a deliberate manner with the muscular groups located in the lower back muscles and giving them great importance and continuous follow -up by forming exercises And its diversification, in addition to targeting the exercises of these muscle groups, made it easy to go towards the return of the muscles to the nature of their functional work properly.the study (Anaam& bushra2023) the process of rehabilitation the muscle groups independently and during A comprehensive training unit can give an opportunity for muscular coordination in the internal work to reach a mechanical overlap in the origin of the functional and motor performance of the muscles in their total from and make the patient feel a state of remarkable improvement in the health aspect . ROMY etl has indicated. Until "the pain areas of muscle suffering, their treatment is different from the nerve pain or bones, as the muscle tissue is more effective and rehabilitation."(Romy Lauche, et al . 2014.) And his study showed that the means used by him gave results in a relatively short period of time and clearly that the use of rehabilitation exercises with the help of auxiliary tools and without them had a great impact in developing the physical capabilities of the research sample that in turn improved their level of performance, as the use of rubber ropes It leads to mobilizing a large number of muscle fibers and recruits a larger number of kinetic units (Salman & Dr. Zainab Ali Abdul-ameer. 2021).

While the SU Haling study, which indicates the (use of therapeutic exercises in the clinical practice of patients with lower back pain, came in the lower back pain. The basic installation exercises can restore the important function of the central torso muscles and increase the effectiveness and process in the sensory integration of the stability of the spine of Individuals with LBP). The aim of this study was to compare the effects of two different exercises, the basic installation exercises (CSE) and strengthening exercises (STE), on deep sense, balance, muscle thickness and the results associated with pain in

patients who suffer from the bottom of the unspecified back pain) (Hlaing, S. S., et al. 2021).

As the lack of exercise of flexibility and strength in the injured people may expose them to the risk of a strong injury, with the difficulty of performing daily life activities, and it may cause a deficiency in the injured person (Al-ghazali, & Al-badry. (2021).

And see that "exercises were an important way to deliver blood to this muscle, especially the muscles associated with the type of kinetic duty and that the sequence of muscles can explain to us an objective way to distribute the exercises in a manner that is appropriate for the type of duty assigned to them"(Tahir, & Dakhil. 2023).

One of the biggest causes of disability in people suffering from LBP. It has been proven that the functional imbalance in the muscles, such as medium brigades, increases the loading of the spine and reduces the stability of the spine. Differences in the function of medium brigades have been identified in those who suffer from LBP compared to those who do not have, although these cases were identified in individual studies. The primary goal remains to determine whether adults who have a satisfactory history of the same suffering of the lower back pain in whether they show differences in the scales of medium brigade when compared to adults who do not have lower back pain.

Some studies have provided results worthy of attention regarding the causes of the lower back pain and its results and how to determine its causes. From these studies, the SEAN SADLER study that showed (that there are specific muscles that may be referred to as a cause of lower back pain than others and among these muscles is the album The middle, which can, by following and diagnosing its functional performance, can determine the cause and the result. The medium brigade in people with lower back pain to show low strength and more stimulus compared to the medium upper muscle for those who do not have symptoms of lower back pain, show the level of activity, fatigue , Activation time, time until the peak of activation, cross section, and muscle thickness is unclear results) (Sadler, S., et al. 2019).

Hence, the two researchers start to adopt its own concept, which relates to the type of her study, which can have varying proportions in shaping the type of pain that causes lower back pains, and therefore the final outcome is we find complementary in the growth and appearance of lower back pain in the sample and that the process of rehabilitating muscle groups independently

and during the unit Comprehensive training can give an opportunity for muscle consistency in internal work to reach a mechanical overlap in the original functional and kinetic performance of the muscles in their overall way and make the patient feel a state of noticeable improvement in the healthy side. The current study was referred to as excellence, as it gave a period of time of training not a little, as the opportunities to reach recovery can be up to 8-10 weeks (Çelenay, Ş., & Özer Kaya, D. 2017) \ (Radhi, and Obaid. 2020).

The two researchers find that it is worth noting that you stand at the physiological or functional causes of pain so that we can later be able to develop suitable solutions for this condition or in accordance with movement. Despite the numerous tests, in a series of research there are no specific explanations for patients in patients. Spinal cord muscles spasms were not found in particular, or signs of muscle tension, another nervous overlap (central or periphery), inside the pelvic or bone problems (shock, disc a bump). The origin of pain caused by the cotton muscle was just a clinical note in The first two cases on it can be asserted that the lower back pain cannot be determined by a muscle group and not others, so we find that the legitimacy of our study is logical in the inclusion of a number of muscular groups of the qualifying program, which goes in the direction of developing effective solutions to address the pain that the sample personnel suffer from.

From Table (2and3), the values of the calculations and normative deviations of the tribal and post-tests also show us the appearance of the value of T for the two tests between the two tests and the level of the error of accepting the zero hypothesis in the presence of differences between the two tests.

Here, the two researchers find that the biometric variables under study that our study adopted were objective and within the axis of the researchers as much as possible, which went to the choice of variables related to the movement of the body within the cross axis of the body, which constitute a separate factor with the lower back, and the results came different according to the type of variable. As the two researchers found that the variable of the torso to the front and the size is the number of degrees of this variable between the longitudinal axis of the torso it met in the hip area with the longitudinal axis of the two men and the measurement of the degrees from the inside achieved this variable moral differences of the value of T (23) and at a level of error reached (0,000) and this result Moral at the level of error (0.05) and

the researchers attribute that the differences recorded here were in the direction of the least value are the most useful because the indication here indicates that the members of the research sample can increase the amount of the torso bending down and in the sense of the most important thing that the intensity of the adaptive pain has become in some extent reviews. Akram Salama notes that "the sources of internal pain in the body's tissue are considered an obstacle and specific to the kinetic duty, but rather a reason for the kinetic range of the joints near the injury "(Salama. 2009).

In Table (3) The two researchers find that the kinetic range of the hip joint and in the front direction has increased its kinetic extent due to the focus on muscle strengthening exercises and a clear restoration of the surrounding tissues, especially since the kinetic range is one of the most important health indicators in the improvement of the part of the body concerned. Among them is one of the most important movement range of the joint under the influence of treatment or rehabilitation, as it represents the pillar of the biological responses of the work environment (Al –Naqib. 2018).

The researchers find that this test, which is the variable of the torso of the imam, is directly linked to the back of the back back, which works to extend the hip joint and the erection of stature as well in adopting the results of changing readings for this variable.

From the same schedule, it shows us variable values, which is the torso to the back below the work of an arc, as the results of the differences between the pre and post tests appeared to us with a value of T (9.4) and at a level of error (0,000) and this result is considered moral at the error level (0.05) and the researchers find that this result is It was in favor of the lower value (for the post -test) if we returned to review the mathematical circles, and the reason is that the measurement of the grades was from the inside between the longitudinal axis of the torso with the longitudinal axis of the two men, intersection of the hip point. This is a clear indication of increasing the kinetic range of the hip joint in the back direction and this range is shared by multiple bone parts such as hips and vertebrae joints that enter into a contribution to achieving this range, and many researchers describe it as (the apparent indication of the mechanical performance of the parts of the body). (Al -Attar and Amin. 1980)

The two researchers believe that the bracket of the back is of great importance in explaining the mechanical performance of the back, as the anatomical nature of the vertebrae in the direction of the back movement is characterized

by (the large limited and limited extent naturally) (Allawi and Abdel –Fattah. 2000).

Here it is worth noting that the improvement in increasing the separation towards the back in the sense of decreasing the measured angle from the inside is an expression of the improvement of the tissues surrounding the joints in general and raising the rubber susceptibility to the muscles as well as the tissue flexibility of the tendons that responded positively towards prolonged. From the same schedule, we find that the right -wing man is like the outstretched side of the side, too, which came with different digital values between them, as the differences between the tribal and post tests achieved a moral value of the amount of T amounting to (8) and at a level of error of (0,000), which is a value of moral significance at the level Error (0.05) The researchers find that the preference was for the post -testing of the increase in the angular difference achieved by the man's relief outside, which was shown by the digital value of the angular difference that is measured from the inside between the two longitudinal axes of the interrupted men in the hip joint. The two researchers find that this moral significance between the two tests is a positive indication of the growing state of improvement and a clear absence of the level of pain accompanying the research sample, and here it is worth noting that "the ability to withdraw the man outside abduction is a movement that requires a kinetic duty of relatively small muscular groups such as the long, sleeper and brutal muscle." (Hislop HJ, Montgomery J. 2007) (Lateef, & Alwan. 2022). And that these muscles are from the muscles under study, research and training, as they are distributed on the lower back muscles, and that the training vocabulary that accompanied the program was a reality objectively and purposefully for the purpose of achieving functional, mechanical and kinetic goals.

It is worth noting that the movement of dimensions to the side requires making a special kinetic effort in order for the player to maintain its balance on the one hand and the optimal performance of the test on the other hand, and here it becomes clear to us that the muscles and nerves were in a positive mechanical response with the type The muscles of the sides are in one. As for the other variable, which is to extend the man to the left side with the stability of the right -wing man, it also came with a clear moral value with the ability of the value of T amounting to (2.6) with an error level (0.046), which is moral at the level of error (0.05). A clear commitment to the vocabulary of the therapeutic and evaluation exercise of the research sample, especially that

most of the sample, if not all of them, were not able in advance to implement these movements with a clear comfort and caused them a clear burden through the assignment of their implementation and the continuous complaint accompanying tribal tests, and all these notes were absent in the post-test.

This is what the researchers met until "the individual's possession of a high level of kinetic abilities helps to exercise many satisfactory activities successfully."(Hadi, Abdul-kareem. 2022)

Which gives us a clear confirmation that the absence of a feeling of pain can give a strong motivation to work by implementing the kinetic duty. indicates that" exercises that target the basic work muscles and assistance occurs physiological adaptation in the muscles of the body according to the use of the maximum range of movement mechanism based on the application of sports training principles in acquiring kinetic capabilities in a distinctive way ,, (Al-temimi, Al-badry. 2023)

Thus, the muscles are adapted to work with a broader and better range, which reduces pain and gradually leads to its demise. The modern means and tools that the two researchers used in measurement and the diagnosis of pain effectively contributed to reducing the effort to qualify the injury and a feeling of recovery within a record period of some kind where (the use of exercises with auxiliary tools had an impact on developing physical capabilities, which in turn led to improved athlete movement). (Salman & Abdul-ameer. 2021) (Ibraheem. 2022).

CONCLUSION

Through displaying, analyzing and discussing the results of pre and post tests, the two researchers concluded: The application of rehabilitation exercises to the affected sample was not left negatively, but they obtained positive effects and rapid improvement and interest in spreading health awareness of following healthy habits while sitting, sleeping, traveling for long distances, or walking or ascend or go down.

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تأثير التمرينات التأهيلية وفق بعض المتغيرات الكينماتيكية في تخفيف آلام أسفل الظهر

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الملخص

الغرض من هذه البحث هو إعداد التمارين وفقا لبعض المتغيرات البايوميكانيكية للنساء المصابات بالآلام أسفل الظهر وتحديد تأثير التمارين وفقا لبعض المتغيرات الميكانيكية الحيوية وتخفيف آلام أسفل الظهر للنساء. استخدم الباحثان التصميم التجريبي ذو اسلوب المجموعة الواحدة. تم اختيار العينة بالطريقة العمدية لتوفير الشروط اللازمة لإجراء الدراسة ، وهي تمثل مجتمع البحث وعينته. كما استبعد الباحثون (2) من النساء المصابات بسبب عدم التزامهن بجلسات إعادة التأهيل ، ولغرض ضمان تجانس أعضاء العينة ، استخدم الباحثان المتوسط الحسابي والانحراف المعياري ومعامل الالتواء لنتائج المسح الميداني في القياسات (العمر والكتلة والطول). وتراوحت أعمار عينة البحث بين (25-35) سنة من الذين أصيبوا خلال فترة زمنية من (1 شهر إلى ستة أشهر) (من تاريخ الإصابة لهم) في التأهيل الطبي. وخلص الباحثان من خلال عرض وتحليل ومناقشة نتائج الاختبارات السابقة واللاحقة إلى أن تطبيق تمارين إعادة التأهيل على العينة المصابة لم يترك سلبيا ، بل حصل على آثار إيجابية وتحسن سريع واهتمام بنشر الوعي الصحي باتباع العادات الصحية أثناء الجلوس أو النوم أو السفر لمسافات طويلة أو المشي أو الصعود أو النزول. من خلال الاستنتاجات التي توصل إليها الباحثان ، أوصوا الغناء برامج تمارين إعادة التأهيل لتطوير قوة العضلات ومرونة العمود الفقري ، وتمارين إطالة العضلات ، ومنع الألم في أسفل الظهر وتجنب الألم

الكلمات المفتاحية : آلام أسفل الظهر ، البايوميكانيك ، تمارين إعادة التأهيل ، الرياضة