

DOI: <https://doi.org/10.54702/5e7fgd32>**The effect of rehabilitation exercises using the inverted table in improving the muscular strength of the back and abdominal muscles for women with herniated disc aged (30-45) years**Zahraa Khalil Ibrahim <sup>(1)</sup> ✉, Suhad Hasib Abdul Hamid <sup>(2)</sup> ✉

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**Received: 04/02/2024, Accepted: 19/02/2024, Published: 30/04/2024**This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/), © Modern Sport**Abstract**

The purpose of this paper is to prepare rehabilitative exercises using the inverted table device for women with a herniated disc, and to identify the effect of these exercises in improving the muscular strength of the back and abdominal muscles in order to get rid of the injury. The importance of rehabilitative exercises using the inverted table lies in improving the muscular strength of women with a herniated disc by restoring functions. Vitality and improving the health of the spine: A herniated disc occurs in most women because they perform incorrect movements, including sudden waist twisting movements, and carry heavy weights, as well as being exposed to traumas such as falls, pregnancy, natural birth of the fetus, and obesity, which causes a herniated disc. The two researchers found while touring the rehabilitation centers that the injured are subjected to methods Repeated and traditional rehabilitation. Therefore, the researchers prepared rehabilitative exercises to treat women with a herniated disc. The experimental approach was also adopted by designing one group with a pre- and post-test on (8) female patients visiting the Autism Center. The chosen method was intentionally appropriate to the nature of the problem in terms of goals and hypotheses. The two researchers prepared rehabilitative exercises that were presented. The experts and specialists in the field of sports medicine then conducted the pre-test and the rehabilitation period lasted for a month and a half at the rate of (24) rehabilitation units. After completing the experimentation, the post-test was conducted and the data was processed according to what the research required using the (SPSS) system. The two researchers assumed that there were statistically significant differences between the results. Pre- and post-tests of the research group in the rehabilitation of women with a herniated disc, so that the conclusions and recommendations for applying rehabilitative exercises using the inverted disc are appropriate for those suffering from a herniated disc. In addition, applying rehabilitative exercises using the inverted table helps in improving the muscle strength of the back and abdominal muscles in women with a herniated disc. It is better not to use the inverted table. For women suffering from eye diseases, high blood pressure, and fractures, it is better for hospitals to pay attention to developing the expertise of therapists working in how to use exercises using an inversion table, in addition to the results reached by the study.

**Keywords****rehabilitation exercises, inversion table, herniated disc.****Introduction:**

(Jumaa Waad) (Rehabilitation exercises are extremely important to rehabilitate and return the affected organ to its normal state without any surgical intervention or chemical drugs. It regulates any body movement that leads to a therapeutic goal, relying in its work on anatomy and physiology in order to return the body to its

natural state or It is closer to nature as it is part of the rehabilitation program, as it causes increased neuromuscular compatibility, gaining flexibility in the joints, lengthening and strengthening the muscles, and for the purpose of achieving the goals of sports therapeutic exercises, the correct anatomical positions must be taken when performing the prescribed exercises, which are

specific sports movements for different local conditions, their purpose is preventive and therapeutic, in order to restore the body. To a normal state or its rehabilitation, in other words, it is: using the basic principles of sensory and motor work that work to influence the ability to respond to muscles and nerves by choosing specific movements and appropriate positions for the body. Many diseases and injuries in the modern era have become treated by practicing organized and appropriate physical exercises. The back, which affects the individual's activity and daily life) (1). (Samia) pointed out that "rehabilitation exercises not only help to strengthen the muscles of the back and abdomen, but also help to strengthen the muscles of the thighs and hips, those parts that help support the back and absorb some of the stress caused by movement" (2). Here, the two researchers believe that rehabilitative exercises are the safest and safest means through which the patient can regain his activity and normal condition in cases that do not require resorting to surgical interventions and medications that often leave undesirable negative effects. As for inversion therapy to relieve symptoms resulting from degeneration of the intervertebral discs or Back herniation (herniated disc), spinal stenosis, or other spinal problems. Suffering from these conditions makes gravitational pressure weigh on the nerve roots, leading to pain in the back, buttocks, legs, and feet. Inversion therapy involves turning your body upside down to increase the space between the vertebrae and reduce pressure on them and on the nerve roots. The treatment can be tried by placing your body upside down at a small angle and then working on increasing the inclination until you reach a stronger position. (Walid) pointed out that (a herniated disc results from many causes, most of which are lifting heavy weights in an incorrect manner, pregnancy, natural birth of the fetus, falling from a high place, and obesity. If we look at the composition of the human body and this part of the body that God Almighty created, we see that its composition is a sign. Among the signs of beauty and perfection, we see that God created the spine and made it composed of vertebrae separated by cartilage for ease of movement and to act as shock absorbers. He gave each cartilage protection in the way the cartilage itself is built, as

it can withstand pressure, tension, and twisting to a great degree. Then protected it with muscles, so made every two vertebrae and cartilage muscles. Specific to them, if these muscles do their job and contract, this contraction will lift the pressure on the cartilage and the symptoms include pain, weakness, and numbness in the spine or extremities) (3) Women bear a great responsibility in our Arab society, especially Iraq, as this led to them neglecting their health, and this leads to many health accumulations that appear on the mirror, including muscle weakness that causes a herniated disc. The importance of the research lies in preparing rehabilitation exercises using the inverted table device, which is used for the first time in the field of scientific research. For women with a herniated disc, the fact that these exercises have a positive effect in restoring functional ability with ease of implementation, with the aim of improving the strength of the lower back and abdominal muscles in the research sample. The importance of research appears using the latest physical therapy devices, which is the inverted table, which contributes to the strength and flexibility of the spine and reducing the pressure of gravity. After the procedure the researchers conducted research and investigation, visited most of the rehabilitation centers, reviewed many Arab and foreign sources, and the Internet, and discussed with doctors and specialists in the rehabilitation of a herniated disc. The two researchers noted the traditional treatment methods for a herniated disc injury, to confirm the need for patients to undergo rehabilitative exercises using the inversion table, which helps in strengthening the back and abdominal muscles and reducing pressure. On the spine, the two researchers worked in the rehabilitation center targeting the muscles surrounding the lumbar vertebrae to provide support and scientific support for sports rehabilitation in accordance with dealing with specialized doctors in an academic manner far from personal diligence or speculation. The objectives of the research are to prepare rehabilitative exercises using an inverted table device for women with a herniated disc and to identify the effect of exercises. Rehabilitation using the inverted table to improve the muscle strength of women with a herniated disc. There are statistically significant differences between the

results of the pre- and post-tests in the muscle strength of women with a herniated disc aged (30-45) years. The areas of research were the human field: the affected women visiting the Autism Center, who numbered (8) Casualties, time field: for the period from (1/11/2023) to (15/12/2023), spatial field Autism Center in Babylon Governorate.

### **Method and procedures:**

#### **Research Methodology:**

The determinants of the problem of the current study forced the two researchers to adopt the experimental research approach in dealing with the methodological steps and to adhere to its limitations in field procedures and experimentation, as the experimental approach is defined as a controlled change of certain circumstances according to specific conditions with an independent variable and testing or measuring its effects in these circumstances, in order to achieve the objectives. The two

researchers adopted the experimental method of one experimental group system with two pre- and post-tests

#### **Research population and sample:**

The research population is meant to be the total group of individuals who share some common characteristics for the purpose of adopting the findings of sports rehabilitation studies that take academic steps as a path. In order to reach these scientific facts, the research population and its sample must be described accurately because it is one of the most important steps before following the sequential methodological steps. The current research problem imposed the limits of this population of women with simple herniated discs aged (30-45) who numbered (8) visitors to the Autism Center. With the help of doctors and specialists, the sample was selected according to the required conditions. The trial period was a month and a half with 24 rehabilitation units, 4 rehabilitation units per week.

**Table .1** shows the homogeneity of the sample in some variables

Variables	Measuring unit	Number	Mean	Std. Deviations	Skewness
Bmi	Kg/meter	8	15,03	0,54	0,0114
Chronological age	Year	8	23,70	4,23	0,227
Age of injury	Month	8	14,00	0,915	0,161

#### **Methods, tools and devices used in research:**

- Arab and foreign sources, the International Information Network (the Internet), personal interviews with doctors and specialists, table number (1).
- Inverted table number (1)

#### **Tests used:**

##### **Test name: Dorsal extension (full extension of the back muscles)**

- The aim of the test is to measure the minimum strength of the back muscles
- Method of performance: lying on the stomach on a rug, with the hands extended back over the back and the legs extended. The experimenter raises them with the knees not touching the ground and remains in the position for 10 seconds.

- Recording - The tester records a point for every second he holds still, the maximum being 10 seconds.

##### **Test name: Lying from the position of extending and raising the legs**

- The aim of the test is to measure the minimum strength of the abdominal muscles
- Method of performance: By lying on the back with the legs extended and clasping the hands behind the back under the neck, the tester raises the legs from the surface of the ground by 10 cm and remains in this position for 10 seconds.
- Recording: A point is recorded for every second that the tester is stationary, the maximum being 10 seconds.

**Exploratory experiment:**

The two researchers conducted the exploratory experiment on three infected women, through which they learned about the validity of the tests and learned about the most important obstacles that the researcher will face in the main experiment and worked to confront them. Due to the accuracy of the results, they were excluded from the main experiment.

**Pre-tests:**

The pre-tests for the research sample took place at ten in the morning at the Autism Center, where the conditions for the tests and the method of conducting them were fixed.

**Main experience:**

The two researchers conducted the main experiment, which included rehabilitation

exercises using the inversion table, with the help of the assistant team at the center, with (4) rehabilitation units (Saturday - Monday - Wednesday - Friday) for a month and a half.

**Post-tests:**

After completing the qualifying exercises, the post-test was conducted, and the researchers took care to conduct the tests in the same place, under the same conditions as the pre-tests, and in the presence of the assistant team.

**Statistical methods:**

The search data was processed through the Statistical Package for the Social Sciences (SPSS).

**Results and discussion:**

**Table .2** shows us the means and standard deviations in the pre- and post-tests

Tests	Pre-test		Post-test		T value Calculated	Level sig	Type sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Back muscle strength	2,88	0,89	5,04	0,16	13,28	0,00	Sig
Abdominal muscle strength	3,36	0,18	5,05	5,44	5,44	0,00	Sig

**Discussion:**

From the results of the pre- and post-tests, it was found that women with a herniated disc improved their level of muscular strength in the post-tests compared to what it was in the pre-tests. The researchers attribute the appearance of these results to the positive effect of the rehabilitative exercises using the inverted table, which helped in the stages of its application to achieve the required improvement through its suitability. For this category of injuries and helping, they develop the muscular strength of the back and abdominal muscles, thus eliminating the injury. (Younis) study indicated (the exercises must be carefully selected and based on scientific foundations in order to target specific muscles or different areas of the body that have dysfunction or atrophy). (4), in order to reach the highest levels of physical healing ability; because these rehabilitative exercises have local and general effects on the

body, and these physical responses appear in all of the muscles, bones, nerves, and circulatory system, and whoever prepares these exercises must be fully aware of their physiology. The body, its anatomy, kinematics, muscle functions, and the natural growth of the human body. During the rehabilitation units and when performing the rehabilitation exercises to strengthen the back and abdominal muscles, other benefits appeared similar to what (Arif) study touched upon (the benefits of rehabilitation: restoring the flexibility of the joints, muscles, and tendons. restoring the elasticity of the connective tissues). The fibers of the tendons and muscles to the maximum possible energy. Increasing the strength of muscle and tendon connections. Improving both motor and sensory coordination (5).

The study by (Inaam Jaafar Sadiq) indicated (the goal of carefully selected exercises for the muscle groups working on the lower back is not only to

reach the highest levels of physical ability, but it is also a future rehabilitation and giving a clear idea to the injured person about how to treat himself with some simple exercises and movements, as well as restoring the daily activity of the injured people because these The slide contains workers and employees who made wrong movements or lifted large loads, which led to their vertebrae slipping. (6). as the researchers concluded that the rehabilitation exercises prepared by the researchers had a positive effect in improving muscle strength and reducing the degree of pain in people. Members of the research sample (7). It is also necessary to avoid exaggeration with the level of illumination and colors of the Fit Light technology and its multiplicity in the rehabilitation environment (8). As it is mentioned in the similar studies (9), (10)

### **Conclusions and Recommendations:**

- Applying rehabilitation exercises using the inversion table improved the strength of the back and abdominal muscles in women with a herniated disc.
- Using the inversion table device as an auxiliary factor alongside exercises accelerated recovery and improved muscle performance largely.
- Exercises using the device contributed to increasing the mobility of the injured women
- Applying rehabilitation exercises to injured women did not leave a negative effect; on the contrary, they obtained positive effects and rapid improvement, with a feeling of immediate comfort while performing the exercises.

### **Recommendations:**

According to the conclusions reached by the two researchers

- Paying attention to the injury when it occurs and giving sufficient time for it to heal
- Spreading awareness and educating injured women by preparing booklets for rehabilitative exercises using the inversion table, their benefits, and the instructions that must be followed.
- Benefiting from the observations made by the two researchers when applying the experiment to treat lower back pain relief for women

- Conduct similar research on sports samples
- It is better not to use the inversion table for women who suffer from eye diseases, high blood pressure, or fractures.
- It would be better for hospitals to pay attention to developing the expertise of working therapists in how to use exercises using the inversion table, i.e. the results reached by the study.

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### Appendix (1)

#### Rehabilitation unit model

Rehabilitation place / Autism Center

The aim of the exercises is to strengthen the back and abdominal muscles

No.	Exercise	Exercise performance time and stability	Repetition	Rest between repetitions	Sets	Rest between sets
1	Lie down and pull the knees with both hands as far as possible and hold still	7second	10	15second	2	3minute
2	Lying on the side and raise the pelvis up by pulling the back muscles to the side by leaning on the elbow and the thigh of the leg, repeating on each side five times and remaining stable.	5second	5	7second	2	2minute
3	Lying down, raise the leg with the knee bent at a 90 angle and return to the initial position and repeat with the other leg	10second	5	20second	3	3minute
4	Lying on your back, bend your knee and bring it to your chest, and hold still. Repeat the exercise on the other side	10second	5	15second		2minute
5	Sit, then lean your torso forward and hold your feet	10second	5	15second	2	2minute

## Appendix (2) Inversion table device



تأثير تمارين تاهيلية باستخدام الطاولة المعكوسة في تحسين القوة العضلية لعضلات الظهر والبطن للمصابات بالانزلاق الغضروفي للنساء بأعمار (30\_45) سنة

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مستخلص البحث

هدف البحث إعداد تمارين تاهيلية باستخدام جهاز الطاولة المعكوسة للمصابات بالانزلاق الغضروفي، والتعرف على تأثير هذه التمارين في تحسين القوة العضلية لعضلات الظهر والبطن من أجل التخلص من الإصابة، وتكمن أهمية التمارين التاهيلية باستخدام الطاولة المعكوسة في تحسين القوة العضلية للنساء المصابات بالانزلاق الغضروفي من خلال استعادة الوظائف الحيوية وتحسين صحة العمود الفقري أن إصابة الانزلاق الغضروفي تحدث عند اغلب النساء لكونهم يؤدون حركات خاطئة منها حركات لف الخصر المفاجئة ويحملون أوزان ثقيلة كذلك التعرض لصدمات مثل السقوط والحمل والولادة الطبيعية للجنين والسمنة مما يتسبب بالانزلاق الغضروفي ووجد الباحثين أثناء التجول في مراكز التأهيل أن المصابين يخضعون لطرق تأهيل متكررة وتقليدية لذلك اعد الباحثون التمارين التاهيلية لعلاج المصابات بالانزلاق الغضروفي كذلك اعتمد المنهج التجريبي بتصميم المجموعة الواحدة ذات الاختبار القبلي والبعدي على المصابات المراجعات لمركز اوتزم وعددهن (8) تم الاختيار بالطريقة العمدية لتكون ملائمة لطبيعة المشكلة من حيث الأهداف والفروض واعد الباحثين تمارين تاهيلية تم عرضها على الخبراء والمختصين في مجال الطب الرياضي بعدها اجري الاختبار القبلي واستمرت مدة التأهيل لمدة شهر ونصف بواقع (24) وحدة تاهيلية وبعد الانتهاء من التجريب اجري الاختبار البعدي وتمت معالجة البيانات وفق مايتطلبه البحث بنظام (spss) وافترضت الباحثتان بأنه توجد فروق ذات دلالة إحصائية بين نتائج الاختبارات القبلي والبعدي لمجموعة البحث في تأهيل المصابات بالانزلاق الغضروفي، لتكون الاستنتاجات والتوصيات بتطبيق التمارين التاهيلية باستخدام الطاولة المعكوسة يلائم المصابات بالانزلاق الغضروفي كذلك يساعد تطبيق التمارين التاهيلية باستخدام الطاولة المعكوسة في تحسين القوة العضلية لعضلات الظهر والبطن لدى النساء المصابات بالانزلاق الغضروفي ومن الأفضل عدم استخدام الطاولة المعكوسة للنساء المصابات بأمراض العيون وضغط الدم المرتفع وحالات الكسور ومن الأفضل أن تهتم المستشفيات بتطوير خبرات المعالجين العاملين في كيفية استخدام التمارين باستخدام الطاولة المعكوسة إي إلى ما توصلت إليه الدراسة من نتائج

تمارين تاهيلية ، الطاولة المعكوسة ، الانزلاق الغضروفي

الكلمات المفتاحية