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## The Effect of a Rehabilitation Curriculum for Developing the Muscles Supporting the Intervertebral Ligaments for People with Lumbar Pain for the Quads

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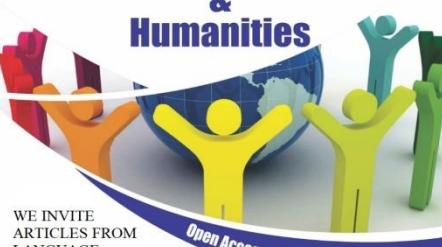
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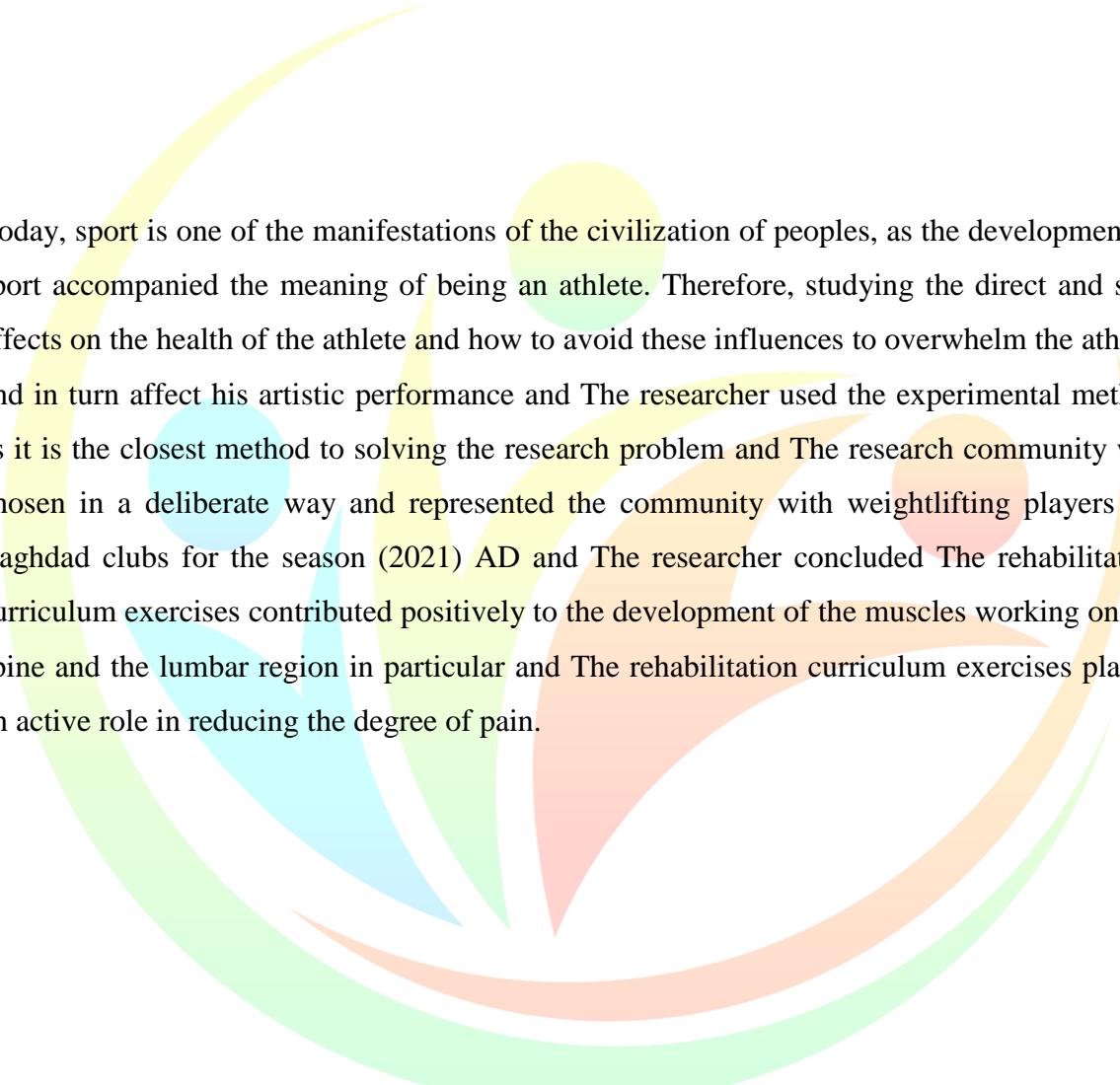
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## ABSTRACT



Today, sport is one of the manifestations of the civilization of peoples, as the development of sport accompanied the meaning of being an athlete. Therefore, studying the direct and side effects on the health of the athlete and how to avoid these influences to overwhelm the athlete and in turn affect his artistic performance and The researcher used the experimental method as it is the closest method to solving the research problem and The research community was chosen in a deliberate way and represented the community with weightlifting players for Baghdad clubs for the season (2021) AD and The researcher concluded The rehabilitation curriculum exercises contributed positively to the development of the muscles working on the spine and the lumbar region in particular and The rehabilitation curriculum exercises played an active role in reducing the degree of pain.

**IJRSSH**

## INTRODUCTION

Today, sport is one of the manifestations of the civilization of peoples, as the development of sport accompanied the meaning of being an athlete. Therefore, studying the direct and side effects on the health of the athlete and how to avoid these influences to overwhelm the athlete and in turn affect his artistic performance.

Specialized sciences have emerged to research in this aspect, such as the science of sports medicine, which examines the biological and health problems of the athlete, that is, how the athlete confronts the problems in the sports environment, in addition to the psychological and functional influences that affect the psychology of the athlete.

All these factors combined made it necessary for a person to make physical activity a necessity of his life, provided that individuals of different ages exercise in order to maintain health and prevent diseases, especially with age.

Among the injuries that have a great relationship with the game weightlifting on the one hand and between high physical effort and poor physical fitness and physical building on the other hand are spinal injuries in general and lumbar pain (lower back) in particular (since 70%-

80%) of people complain of lower back pain during their lives, and these pains lead to limiting the activity of individuals.

Some sources indicate that "the rate of infection with this pain reaches one person out of every six people"

The training loads that affect the back muscles of the quads throughout the training periods, which sometimes reach tens of tons, and they suffer from pains of different intensity in the lower back area. This area has functional importance in bearing the weight of the body as well as its ability to move in various directions, and there are many reasons for this Pain, including joint stiffness, muscle weakness in the lumbar region, and lack of interest in developing the muscles supporting the intervertebral ligaments of the back in different stages of life.

And (Kalpet) pointed out that "about 80% of the human race complains about the pain in the lower part of the spine, as the lack of exercise and the weakness in the continuous muscle tension, in addition to the dangers of civilian life, prepare the person for the problem of back pain."

And through the previously mentioned sources that indicate that many people have been exposed to these injuries. So, there must be therapeutic exercises to reduce this back pain for athletes in

general and for lifting weights, especially because the spine and the structures surrounding it are important in erecting and balancing the body.

If a person is an athlete or a non-athlete, then either he becomes an athlete. What is the most pain at the present time for athletes in the lumbar region, especially among players who lift weights because of the weakness of the muscles supporting the vertebral ligaments, the hardness of the floor and the intensity of exercise.

Given the importance of this topic, the researcher worked on preparing special exercises to develop the muscles supporting the vertebral ligaments, directly or indirectly, for the purpose of reducing the occurrence of injuries, pain and associated deformities, especially lower back pain. From this point of view, the researcher went to what is new in the world of sports training to develop muscle strength (which is the mainstay in the elements of physical preparation), which is training based on isokinetic muscle contraction, which works to develop the special strength of the muscles working during motor performance through work, or Performance similar to movement or activity and in the same direction as muscular work.

The importance of the research lies in preparing special exercises to develop the

muscles supporting the vertebral ligaments in terms of strength, strength and flexibility, and the application of these exercises during the main section of the training curriculum in the period of general preparation for weightlifting players who suffer from pain in the lumbar region in order to try to remove these pains or move it.

The spine is the main axis on which the body rests in general and the lumbar region in particular, and its injuries often hinder a person from moving naturally.

Among those injuries and pains that affect people in general are the pain in the lumbar region as a result of its wide movement, as well as the weight of the body that it bears, and one of the causes of these pains is the lack of exercise.

And that problem developed and became not exclusive to non-athletes, but also to athletes, despite their regular exercise. These injuries and pains are due to an external factor or poor sports equipment (non-specialized shoes). At the same time, there are many other reasons for these injuries and pains, including negligence. Warm-up and lack of interest in it, lack of physical fitness and increased effort.

For the purpose of reducing or reducing these pains, the researcher decided to prepare therapeutic exercises given in the

main section of the training unit for players who suffer from these pains in developing the muscles supporting the spinal ligaments of the back directly or indirectly, and all this leads to finding a strong support for the spine .. and then Reducing or reducing the pain in the lumbar region of the spine.

#### **Research goal:**

- Prepares special therapeutic exercises that develop the muscles supporting the intervertebral ligaments of the back to treat low back pain (lumbar region)
- Knowing the effect of these special exercises in developing the muscles supporting the spinal ligaments of the back and reducing or reducing lower back pain.

#### **Force search:**

Special therapeutic exercises have a significant (positive) effect in developing the muscles supporting the vertebral ligaments of the back and reducing lower back pain.

#### **Research areas:**

- The human domain
- The players of the Baghdad Municipality Club and Al-Walaa Club lift weights who suffer from lumbar pain.

#### **Time domain:**

Duration from (19/2/2021- 31/4/2021) -

#### **:spatial domain**

Weightlifting Training Center and Weightlifting Hall of Baghdad

#### **MATERIALS AND METHODS:**

#### **Research Methodology:**

The research method is defined (as the method that the researcher follows in studying the problem to discover the truth)

The researcher used the experimental method as it is the closest method to solving the research problem

(The experimental method is one of the most accurate types of approaches because the research mainly uses experience in an attempt to study the problem and adjusts all the variables except for one variable called the experimental variable, which the researcher works to surround to know its effect in the research)

He also used one of the designs of the basic experimental curriculum, which is the system of one equal group with two tests, the pre and post tests because (it is the most appropriate experimental system for the nature of the research, as the researcher in this design notes the performance of the subjects before applying the experimental variable

(therapeutic exercises) and after it measures the amount of change they have. One of the advantages of this design is that it needs only one set, so it is easy to use, and it is one of the best designs used in scientific and educational research.

### **Search community and sample:**

The research community was chosen in a deliberate way and represented the community with weightlifting players for Baghdad clubs for the season (2021) AD.

The researcher's selection of the sample is one of the important steps and stages of the research. There is no doubt that the researcher thinks about the research sample since he begins to identify the problem and its objectives, because the nature of the research, its hypotheses and plan control the steps of its implementation and the selection of its tools such as the sample, questionnaires and necessary tests.

Therefore, the research sample was also chosen in a deliberate way from the weightlifting players of the Baghdad Club and the Loyalty Club, as (7) were selected from the Baghdad Club and (6) from the Loyalty Club who feel (chronic) lower back pain.

The number of sample members was (13) players, but when conducting the examination and radiography, it appeared

that one of them suffers from a deformity in the spine (proximity of the vertebrae), so he was excluded, and thus the number of individuals who participated in the tribal tests reached (12) players who have (chronic) pain at the bottom of the spine distributed to different degrees ... They actually participated in the application of the vocabulary of therapeutic exercises and post-tests as well, and they were selected and subjected to therapeutic exercises according to the questionnaire form that was developed for this purpose, in addition to conducting an x-ray for them and presenting it to specialists in this field. The sample percentage was 21% for the sample population.

### **The homogeneity of the research sample:**

The researcher chose the method of testing the individual group for its suitability to the research method used, and for the purpose of ensuring that the research sample is distributed naturally in some variables related to the subject of the research such as (age, height and weight), as the homogeneity in the gender variable is achieved because the sample members are all male, so the researcher conducted a test Skewness (Most of the sample distributions are not completely symmetrical, and the frequency on one side of the maximum value decreases at a

rate more than the other side, and this deviation from symmetry is called skewness)

The researcher treated the variables (age, height, weight) by means of the skew

coefficient method, and obtained the following values for the study sample of (12) players. Table (1)

Table No. (1)

skew modulus	deviation	Mediator	Arithmetic mean	Statistical variables processing
0.837	3.222	21.50	22.750	age (year)
0.010	3.623	170.000	170.083	length (cm)
1.195	5.258	72.150	69.491	Weight (kg)

It is noted from Table (1) that the values of the skew coefficient approached the degree (zero) and did not exceed the degree (+3), which means that the research sample was within the normal distribution in the variables (age, height, and weight), which reflects the homogeneity of the sample in those variables and careful The researcher is based on the principle of homogeneity of the sample, which may influence the results of the research.

#### Means of gathering information, tools and devices used in research:

The researcher used the following devices and tools that helped to complete the research:

An electronic scale for measuring weight, made in China -

A ruler is inserted to measure the length -

- Dynamometer to measure the strength of the muscles of the trunk and thighs, type {TAKEL KIKI} Model No. 833184 Japanese made.

- A heavy iron bar (5 kg) with iron pellets (dumbbells) (2.5 kg), two of them German-made.

- A German-made stop watch

- Japanese-made Casio scientific calculator

- A table with a ruler inserted in the middle to measure flexibility

Films for radiography (ACCMA) of Egyptian origin -

A German-made radiographic imaging device (SIEMENS) -

Video camera (sony) -

Japanese-made Cannon camera -

- Canadian-made FOX whistle

- The computer

Examination and testing beds -

A football field, indoor halls, a weight room and a swimming pool -

Chairs -

Personal interviews -

Auxiliary work team -

Sources, references and the World Wide Web (Internet) -

Data collection methods:

: Measurements and tests used in the research

For the purpose of determining the appropriate measurements and tests, the researcher prepared a questionnaire and pictures of the tests and they were presented to a group of experts. After reporting the data of the forms and extracting the percentage, he nominated the following measurements and tests:

First, the measurements:

- Measuring body weight by means of an electronic scale. One number. The laboratory stands on the base of the scale, barefoot and wearing light sports clothing. After that, the number that appears on the digital screen is recorded in (kg)

- Height measurement (the lab stands upright, the ruler is placed on the wall, the lab stands next to the ruler, and the number is recorded in (centimeter)

Second: The tests used in the research:

“Testing the strength of the back muscles using a dynamometer-”

Purpose. Measure the strength of the back muscles.

Necessary tools: a dynamometer to measure the strength of the muscles of the back and legs.

Description of performance: The tester stands on the base of the device with the legs extended straight, then the tester maintains the protrusion of his chest forward, then holds the handle from both ends and tries to pull it up to the side of the scapula.

“Testing the maximum strength of the thigh muscles using a dynamometer -”

Purpose. Measure the maximum strength of the muscles of the thighs.

Necessary tools: a dynamometer to measure the strength of the muscles of the back and legs.

Performance description: The feet are placed on the flat board of the dynamometer, then the tester bends his knees at an angle of (90) degrees with his head raised and his back erect, then works to hold the handle from both ends with shortening the length of the handle chain and then tries to pull using his legs.

"Test to measure the length of the trunk strength - "

Purpose. Trunk muscle length measurement

Necessary tools. stopwatch + registration form

performance description. From the prone position, the hands are intertwined behind the head, and the tester raises his body (the head and chest) off the surface of the ground and remains in that position as isometric resistance of the back muscles, noting that the feet are fixed on the ground by the recording colleague and the laboratory records the time in which he remained fixed in that position without touching his elbows or below its lower jaw to the surface of the earth.

The torso flexion test from a standing position

Purpose. Measuring the flexibility of the trunk and thigh in forward bending movements from a standing position.

Necessary tools:

A- A measure (ruler) of length 20 cm.

b- A flat table that bears the weight of the laboratory.

#### **Performance description:**

Fixing the ruler on the edge of the table, so that the middle of the measurement is at the top of the edge of the table and the other half is at the bottom of the edge.

The point (zero) is in the plane of the edge of the table, and the deviations of the degrees that lie in the upper half (minus) and those in the lower half (positive)

" - The Abdominal Muscle Extension Test" (Endurnace) until exhaustion of effort and pain, and it is calculated by the number of repetitions. It is measured by an exercise developed for this purpose and by my agencies.

Lie on the back - the legs are bent with the feet on the floor - and the assistant stabilizes the feet. The laboratory sits and lies.

#### **: Exploration Experience**

It is a preliminary experimental study carried out by the researcher on a small sample before carrying out his research,

aiming to choose the research methods and tools

When conducting the exploratory experiment, the researcher took into account the necessity (that it fulfills the same conditions and circumstances as the main experiment as possible so that its results can be taken into account) as the researcher conducted his exploratory experiment on Friday 19/2/2021 on a sample consisting of (5) players were randomly selected from the research sample, and then repeated the experiment after 6 days, i.e. on Thursday 26/2/2021 in order to find scientific transactions for the tests (honesty, reliability and objectivity) and in order to ensure the safety of the devices and tools used in the research, and to avoid the negative aspects that The conduct of the main experiment and the training of the assistant work team were accompanied by an explanation of the vocabulary of therapeutic exercises and a correct idea of implementation. The exploratory experiment serves as a practical training for the researcher with the aim of identifying by himself the obstacles that he may face when applying the main experiment for the purpose of avoiding them. The researcher came out with positive results when applying the exploratory experiment, including:

The safety of the devices and tools used in the experiment -

Appropriateness of measurements and tests to the research sample -

Understand the vocabulary of therapeutic exercises to the fullest -

Identify the capabilities of the assistant work team -

Extracting the scientific transactions of the tests (honesty, reliability and objectivity)

Through the application of the Pearson correlation coefficient, which shows the degree of correlation between the first and second tests. The value of the correlation for testing the strength of the back muscles using a dynamometer was (0.83). As for the value of the correlation coefficient for testing the strength of the thigh muscles using a dynamometer, the value of the correlation coefficient was (0.86). To test the elongation of the abdominal muscles, it reached (0.81), while the value of the back flexibility test was (0.89), and the value of the correlation coefficient for the strength elongation test for the trunk muscles was (0.85), and the value of the correlation coefficient for testing the degree of pain from the lying position was (0.83). The value of the correlation coefficient to test the degree of pain from the prone position was (0.80)

The degree of stability of the test is considered high whenever the reliability coefficient approaches (+1) and with the test obtaining a high degree of stability, the objectivity coefficient will be achieved. (The higher the reliability coefficient corresponds to the higher the objectivity coefficient)

#### Radiography: X-ray

The researcher took (26) radiographs (front and side view) to ensure the integrity of the spine of the research sample and the absence of any injuries in the vertebrae.

X-rays were taken at Imam Ali Hospital (peace be upon him) and the view (front and side) of the spine was taken in order to achieve the factor of accuracy and to ensure that there was no defect in it.

The radiographs were presented to a group of experts and specialists in the medical field, and the results showed the presence of one case from the research sample group suffering from a clear deformation of the spine (proximity of the vertebrae), so it was excluded from the research sample, and the results of the radiological examination were confirmed by medical documents that confirmed this.

#### Arab and foreign sources and the Internet:

The researcher used a number of scientific, Arab and foreign sources, as well as the global information network (Internet)

#### :Information Collection Form

##### Part one: Informational questionnaire:

The researcher prepared a special form to collect the information that he intends to obtain from the sample members, and this form contained several questions that were divided into two parts, the first section included general information and the other section contained information related to lower back pain.

This form was presented to a group of specialized experts

For the purpose of ascertaining the validity of this form and the comprehensiveness of the questions contained therein, the experts agreed that the form achieves the purpose for which it was developed due to the comprehensiveness of the questions contained in it, with the addition of a number of questions from the experts.

#### Part Two: Pain Scale Form (V.A.S) Visual Analogue Scale

The researcher conducted some tests to find out the pain in the lower back area (lumbar region) according to certain movements related to the injury area.

imaginary) through which he can know the degree of change in the degree of pain.

The movements used and the imaginary ruler were presented to a group of experts in this field. And they found it adequate for the purpose to be measured. The movements used in this test are:

- . Raise the legs outstretched to the top from a lying position

The ruler (75) cm is the maximum degree that the sample can reach and is divided by

- . (10)and every (7.5) cm becomes a degree

- .Raise the torso up from the prone position

The ruler (50) cm is the maximum degree that the sample can reach and is divided by

- . (10)and every (5) cm becomes a degree

A degree of (0) means no feeling of pain and a degree of (10) means that there is a high degree of pain.

### **Main experience**

Field Research Procedures:

Tribal tests:

The tribal tests were conducted on the research sample on Sunday 28/2/2021 in the inner hall of the Loyalty Sports Club, and lasted for three days.

Suggested special exercises (main experiment):

The researcher prepared special exercises aimed at developing the muscles supporting the vertebral ligaments by strengthening the back and abdominal muscles, strengthening the muscles of the thighs, increasing their flexibility and extending their strength, as well as relieving pain using the means mentioned in the scientific sources that achieve this.

The vocabulary of special exercises was presented to a group of experts and specialists in the field of training science, sports medicine and rehabilitation, and all of the experts agreed on the appropriateness of the vocabulary of therapeutic exercises with the addition of some exercises to it and deleting some of them to achieve the objectives of the research.

The exercises aimed to develop the characteristic of muscular strength in the main and its length, as well as developing the characteristic of flexibility, as (therapeutic approaches to lower back pain should aim to restore the basic characteristics of the individual, which are strength and flexibility)

The application of therapeutic exercises to the research sample was started on Saturday, 6/3/2021 by the circular training

method, and lasted (8) weeks with (3) units per week distributed over the days (Saturday, Monday and Wednesday) of the Al-Walaa Sports Club and the days (Sunday, Tuesday and Thursday) of the Baghdad Sports Club Thus, the total number of units reached (24) units for each club, and the application of special therapeutic exercises during the main section of the training unit was in the physical aspect of this section, and the time of these exercises took from (30-45) minutes.

First, warm up:

And the warm-up was for the players suffering from these pains with their fellow team members, with confirmation by the assistant team on the players in the special warm-up on the muscles of the back, abdomen and thighs to prepare them for the main section of the first part (the physical side) represented by special therapeutic exercises for the injured players and the usual physical side for the other players The team warm-up exercises included the following:

(walking, light jogging, spot jumping, upper extremity exercises, torso rotations, lower extremity stretches)

Second: The main section:

It has two aspects:

A - The physical aspect (special therapeutic exercises)

B - the skill side (skills - game plans)

A - The physical aspect (special therapeutic exercises)

The time of these exercises took (30 - 45) minutes from the time of the main section, which is the physical aspect of this section. And accuracy during the performance of these exercises in order to obtain the process of full stretching of the muscle in order to avoid any injuries, as (excessive tensile exercises reduce the chances of removing pain, so the principle of gradual intensity must be adopted to remove pain, and return to the normal state)

The exercises must also be performed in the correct form, taking into account the gradation of the training load and training intensity, because (the increase in the intensity of exercise during the therapeutic units must be gradual)

Determining the training load levels for the training departments in therapeutic exercises:

First, the size:

(The number of circuit exercises and the number of repetitions for each exercise is determined) by knowing the maximum repetition of each exercise, preferably from

1/4: 1/3 the maximum number of repetitions of each exercise, that is, if the maximum number of repetitions of each exercise, for example, 24 repetitions, the appropriate dose is 6 / 8 repetitions) Therefore, the researcher determined the number of repetitions as follows:

Homogeneity in the quality of the exercises in terms of the difficulty of performance in order to determine (the intensity of the exercise) through the number of repetitions of the exercises per week and the pulse rate and the exclusion of exercises that are very difficult to perform on the players as well as the very easy to perform for the players.

For each physical ability to develop its own characteristic, a work/rest system, for example, the elongated force 1/2 or 1/4

Determine the frequency for the week by the maximum performance in 30 seconds by dividing by 4

-Using the crowned gradient to recruit kinetic units, then recruit more units, then most of them, and so on, and then a recovery period for these units to produce a greater force in the coming weeks.

First week: Recall several exercises:

Three players who suffer from lumbar pain without the sample) perform the maximum exercise for 30 seconds and know the

maximum repetition in this period and then exclude the most difficult and easiest exercises so that the rate of repetition of exercises during one week is equal in terms of the maximum within 30 seconds Where the difficult exercises were very few repetitions and the easy exercises were very large.

Then it was found that the rate of the minimum (29 repetitions) and the maximum

35repetitions averaged between the two, became (32 repetitions) the average max. exercise in 30 seconds (based on 1/4 ratio (

The repetition of the first week will be  $32/4 = 8$  repetitions and gradual incremental increments in the coming weeks.

The second week: Recall several exercises:

Three players who suffer from lumbar pain without a sample) perform exercises through the maximum within 30 seconds as well. During this week, the exercise whose repetition within 30 seconds is less than (29 times) and the exercise whose frequency is more than (35 times) was excluded. ) at the same time.

In order to maintain the maximum rate of exercise within 30 seconds, which is

32times and thus the increase in the frequencies gradually from one week to

the next, and thus the intensity increases from week to week with the increase in the frequency because the relationship between these two components (intensity and volume) is mostly inverse, as the increase in volume is at the expense of intensity and vice versa, and that the increase in volume With the increase in intensity, it is one of the most important and difficult relationships between these two components, which requires a certain level of training.

And the repetition in this week becomes  $(8 + 2) = 10$  repetitions

The increase for the other weeks is by increasing the repetition or increasing the number of citets with constant repetition.

The third week  $= 8 + 2 = 10$  repetitions and an increase of  $10 \times 4$

) fourth week = 8 repetitions (recovery

Fifth week  $= 8 + 7 = 15$  repetitions

Sixth week  $= 8 + 12 = 20$  repetitions

Seventh week  $= 8 + 12 = 20$  repetitions (repetition stability and increased tensile strength) inside the water

The eighth week  $= 8 + 7 = 15$  repetitions (healing recovery) inside the water

Second: intensity

A-(Rating the intensity by pulse based on the age of the athletes in years (

It is done according to the following equation:

$$(220)\text{fixed number} - \text{athlete's age} = \text{maximum heart rate}$$

$$\text{Maximum heart rate} \times \text{desired intensity}$$

$$\frac{\text{The number of heart beats at the desired intensity}}{100} =$$

100

$$\text{Maximum heart rate} = 220 - 25, \text{age} = 195$$

b- By percentage:

$$195 \times 6$$

$$) \times ( \quad ) =$$

100

The athlete's pulse is measured after completing one training circuit, and the sample's pulse rate is taken after the effort to compare with the sample's maximum pulse rate to determine the intensity during this circuit.

Third: comfort.

A- Short rest:

It is the period of time to the degree of repetition of the exercise despite the decrease in the efficiency of the body

under the influence of the previous exercise. It is used in competition and endurance training. This rest was used between repetitions and between one exercise and another.

b- Long rest:

It is the time period that increases the time period for full recovery from (1.5-2) times and is used in high and medium intensity exercises. This rest was used between training sessions.

And based on what was previously mentioned that the researcher used the circular training method with (8) exercises, the session begins with exercise No. (1) and ends with exercise No. (8), and there is a rest period between one exercise and another, and between each session and another, there is an intermittent rest period as well.

Emphasis was placed on the inhalation and exhalation processes during the performance of each exercise and how

Taking the inhale and how to exhale during one exercise, because it must be (linking therapeutic exercises with breathing exercises because this leads to improving the process of external breathing)

Emphasis was also placed on developing the muscles supporting the intervertebral

ligaments by strengthening the dorsal muscles, especially the lower back, abdominal muscles and thigh muscles, as well as increasing the strength of these muscles and increasing their flexibility. The exercises included different positions, including (standing, lying down, prone, sitting for a long time, sitting down, and leaning on all fours)

It was also emphasized to the sample members that if the mother feels an influence while performing exercises that are somewhat difficult, he must immediately stop performing this exercise to prevent complications, and the player is not obligated to apply the repetition set for him every week, but according to his ability because he is injured, and after completion From performing the exercises and the end of the physical aspect, the player is given a rest for a period of (3) minutes, then he goes with his fellow team members to the skill side and the second section of the main section to complete the team's training unit.

Post – Tests:

After the research sample completed the training units - all the therapeutic exercises, which included (8) weeks with (3) units per week, the post tests were conducted for a period of three days as well, from Tuesday 4/5/2021 to 6/5/2021, in order to measure the progress The

outcome of the research sample, and the researcher took into account conducting the tests in the same spatial and temporal conditions in which the tribal tests were conducted.

### Statistical means

The researcher used the appropriate statistical methods to process the search results using the direct statistical package system (SPSS) in addition to the use of a manual computer.

Arithmetic mean -

Std. Deviation -

T-Test law for correlated samples -

Pearson's Law of Correlation -

Mediator-

skew modulus-

Percentage = Part/Whole x 100-

Table (2): It shows the values of the arithmetic means, standard deviations, and the level of significance of the differences between the pre and post tests in measuring the strength of the back muscles.

At the degree of freedom (11) and the level of significance (0.05)

### RESULT AND DISCUSSION:

Presentation, analysis and discussion of the results:

This section includes a presentation of the results reached by the researcher according to the data he obtained in the light of the application of measurements and tests before and after which were conducted on the research sample and converted into tables and graphic forms as an explanatory tool for the research to achieve the two objectives of the research and verify the validity of its hypothesis and then analyze and discuss these results in a manner Accurate scientific supported by scientific sources and previous studies.

Presentation and analysis of the results

Presenting the results of measuring the strength of the back muscles of the research sample and analyzing it

Significance level of differences	T		fo	f	post test		pretest		Variable Statistical
	tabular	calculated			standard deviation	Arithmetic mean -	standard deviation	Arithmetic mean -	Methods
<b>moral</b>	<b>2.2</b>	<b>3.858</b>	<b>2.505</b>	<b>9.66</b>	<b>24.06</b>	<b>65.33</b>	<b>28.01</b>	<b>55.66</b>	<b>Back muscle strength kg)(</b>

Table (2) shows the values of the arithmetic means and standard deviations in the pre and post tests to measure the strength of the back muscles in relation to the research sample.

The arithmetic mean of the strength of the back muscles in the pre-test was (55.66), with a standard deviation of (28,014)

In the post-test, the arithmetic mean of the same variable was (65,333) with a standard deviation of (24.06)

To verify the significance of the differences between the arithmetic means in the pre and post tests, the T-Test was used for the correlated samples. The calculated (T) value was (3.858), while its tabular value is (2.2) at the degree of freedom (11) and the level of significance

(0.05). It means that there is a significant difference between the pre and post tests in measuring the strength of the back muscles of the research sample.

Presenting the results of measuring the strength of the posterior thigh muscles of the research sample and analyzing it

Table (3): It shows the mean values, standard deviations, and the level of significance of the differences between the two tests, pre and post tests in measuring the strength of the hamstring muscles

At the degree of freedom (11) and the level of significance (0.05)

Significance level of differences	T		fo	f-	post test		pretest		Variable Statistical Methods
	tabular	calculated			standard deviation	Arithmetic mean -	standard deviation	Arithmetic mean -	
<b>moral</b>	<b>2.2</b>	<b>4.173</b>	<b>2.535</b>	<b>10.583</b>	<b>22.378</b>	<b>41.50</b>	<b>17.921</b>	<b>30.916</b>	<b>Thigh strength (kg)</b>

Table (3) shows the values of the arithmetic means and standard deviations in the pre and post tests to measure the strength of the thigh muscles for the research sample.

The arithmetic mean of the strength of the thigh muscles in the pre-test was (30.916), with a standard deviation of (17.921)

In the post-test, the arithmetic mean of the same variable was (41.500), with a standard deviation of (22.378)

To verify the significance of the differences between the arithmetic means

Table (4): It shows the values of the arithmetic means, standard deviations, and the level of significance of the differences between the two tests, before and after, in measuring the length of force of the abdominal muscles.

At the degree of freedom (11) and the level of significance (0.05)

in the pre and post tests, the T-Test was used for the correlated samples. The calculated (T) value was (4.173), while its tabular value is (2.2) at the degree of freedom (11) and the level of significance (0.05). When comparing the tabular and calculated (T) value, it was found that the calculated value is greater than the tabulated value, and this means that there is a significant difference between the pre and post tests in measuring the strength of the back muscles of the research sample.

View and analyze the results of the abdominal muscle strength test

Significance level of differences	T		fo	f-	post test		pretest		Variable Statistical Methods
	tabular	calculated			standard deviation	Arithmetic mean -	standard deviation	Arithmetic mean -	
<b>moral</b>	<b>2.2</b>	<b>5.794</b>	<b>1.395</b>	<b>8.083</b>	<b>16.919</b>	<b>54.583</b>	<b>16.25</b>	<b>46.50</b>	<b>Abdominal muscle strength once)</b>

Table (4) shows the values of the arithmetic means and standard deviations in the pre and post tests to measure the length of abdominal muscle strength in relation to the research sample.

The arithmetic mean of the abdominal muscle elongation strength in the pre-test was (46.500) with a standard deviation of (16.250). In the post-test, the arithmetic

mean of the same variable was (54.583), with a standard deviation of (16,919).

To verify the significance of the differences between the arithmetic means in the pre and post tests, the T-Test was used for the correlated samples. The calculated (T) value was (8.083), while its tabular value is (2.2) at the degree of freedom (11) and the level of significance

(0.05). When comparing the tabular and calculated (T) value, it was found that the calculated value is greater than the tabulated value, and this means that there is a significant difference between the pre and post tests in measuring the strength of the back muscles of the research sample.

View and analyze the results of the back flexibility test from a standing position

Table (5): It shows the values of the arithmetic means, standard deviations, and the level of significance of the differences between the pre and post tests in the back flexibility test from a standing position

At the degree of freedom (11) and the level of significance (0.05)

Significance level of differences	T		fo	f-	post test		pretest		Variable Statistical Methods
	tabular	calculated			standard deviation	Arithmetic mean -	standard deviation	Arithmetic mean -	
<b>moral</b>	<b>2.2</b>	<b>7.746</b>	<b>0.398</b>	<b>3.083</b>	<b>4.706</b>	<b>9.166</b>	<b>4.440</b>	<b>6.083</b>	<b>Back flexibility from a standing position (cm)</b>

Table (5) shows the values of the arithmetic means and standard deviations in the pre and post tests to test the flexibility of the back from a standing position in relation to the research sample.

The arithmetic mean of the back flexibility test from a standing position in the pre-test

was (6.083) with a standard deviation of (4.440).

In the post-test, the arithmetic mean of the same variable was (9.166) with a standard deviation of (4.706).

To verify the significance of the differences between the arithmetic means

in the pre and post tests, the T-Test was used for the correlated samples. The calculated (T) value was (7.746), while its tabular value is (2.2) at the degree of freedom (11) and the level of significance (0.05). It means that there is a significant

difference between the pre and post tests in the back flexibility test from a standing position for the research sample.

Presentation and analysis of the results of the strength test for the muscles of the trunk

Table (6): It shows the values of the arithmetic means, standard deviations, and the level of significance of the differences between the pre and post tests in the strength prolongation test of the trunk muscles

At the degree of freedom (11) and the level of significance (0.05)

Significance level of differences	T		fo	f-	post test		pretest		Variable Statistical Methods
	tabular	calculated			standard deviation	Arithmetic mean -	standard deviation	Arithmetic mean -	
<b>moral</b>	<b>2.2</b>	<b>7.454</b>	<b>0.905</b>	<b>6.750</b>	<b>16.961</b>	<b>36.33</b>	<b>16.08</b>	<b>29.58</b>	<b>Strength extension of the trunk muscles (second)</b>

Table (6) shows the values of the arithmetic means and standard deviations in the pre and post tests for the test of the strength prolongation of the trunk muscles in relation to the research sample.

The arithmetic mean of the strength lengthening of the trunk muscles in the pre-test was (29.583), with a standard deviation of (16.087)

As for the post-test, the arithmetic mean of the same variable was (36,333) with a standard deviation of (16,961)

In order to verify the significance of the differences between the arithmetic means in the pre and post tests, the T-Test was used for the correlated samples. The calculated value of (T) reached (7.454), while its tabular value is (2.2) at the degree of freedom (11) and the level of significance (0.05). It means that there is a significant difference between the pre and

post tests in this variable among the research sample.

The results of the questionnaire questionnaire form the degree of pain from

the position (lying, and from the prone position) and its analysis.

First :- Presenting and analyzing the results of the pain degree questionnaire form from the lying down position

Table (7): It shows the values of the arithmetic means, standard deviations, and the level of significance of the differences between the two tests, the pre and post tests, in the questionnaire form for the degree of pain from the lying position.

At the degree of freedom (11) and the level of significance (0.05)

Significance level of differences	T		fo	f-	post test		pretest		Variable Statistical Methods
	tabular	calculated			standard deviation	Arithmetic mean -	standard deviation	Arithmetic mean -	
<b>moral</b>	<b>2.2</b>	<b>17.640</b>	<b>0.225</b>	<b>3.975</b>	<b>1.114</b>	<b>2.516</b>	<b>1.470</b>	<b>6.491</b>	<b>Pain Score Questionnaire Form Lying (0-10)</b>

Table (7) shows the values of the arithmetic means and standard deviations in the pre and post tests, the questionnaire form for the degree of pain from the lying position for the research sample.

The arithmetic mean of the pain degree questionnaire test in the pre-test was (6.491) with a standard deviation of (1.470)

In the post-test, the arithmetic mean of the same variable was (2.516) with a standard deviation of (1.114)

To verify the significance of the differences between the arithmetic means in the pre and post tests, the T-Test was used for the correlated samples. The calculated (T) value was (17.640), while its tabular value is (2.2) at the degree of freedom (11) and the level of significance (0.05). When comparing the tabular and calculated (T) value, it was found that the calculated value is greater than the tabulated value, and this means that there is a significant difference between the pre and post tests in the test of the pain degree

questionnaire form from the lying position of the research sample

The results of the questionnaire form for the degree of pain from the position (lying,

and from the prone position) and their analysis

Second: Presenting and analyzing the results of the pain degree questionnaire from the prone position

Table (8): It shows the values of the arithmetic means, standard deviations, and the level of significance of the differences between the two tests, the pre and post tests, in the questionnaire form for the degree of pain from the prone position

At the degree of freedom (11) and the level of significance (0.05)

Significance level of differences	T		fo	f-	post test		pretest		Variable Statistical Methods
	tabular	calculated			standard deviation	Arithmetic mean -	standard deviation	Arithmetic mean -	
<b>moral</b>	<b>2.2</b>	<b>28.399</b>	<b>0.105</b>	<b>2.983</b>	<b>1.137</b>	<b>2.016</b>	<b>1.330</b>	<b>5.000</b>	<b>Pain Score Questionnaire Form (0-10)</b>

Table (8) shows the values of the arithmetic means and standard deviations in the pre and post tests, the questionnaire form for the degree of pain from the prone position for the research sample.

The arithmetic mean of the pain degree questionnaire test from the prone position in the pre-test was (5,000) with a standard deviation of (1.330)

In the post-test, the arithmetic mean of the same variable was (2.016) with a standard deviation of (1.137)

To verify the significance of the differences between the arithmetic means in the pre and post tests, the T-Test was used for the correlated samples. The calculated (T) value was (28,399), while its tabular value is (2.2) at the degree of freedom (11) and the level of significance (0.05). It means that there is a significant difference between the pre and post tests in the test of the questionnaire form for the degree of pain from the prone position of the research sample.

## DISCUSS THE RESULTS:

The previous tables and figures show that there is a clear difference in the arithmetic circles section in the post-test compared to the pre-test, which led to the emergence of a significant difference in the statistical values due to the clear development in the muscular strength of the back muscles, the thigh muscles, the length of the strength of the abdominal muscles and the flexibility of the back muscles. And the extension of strength to the muscles of the trunk and achieve the degree of pain in the lower back.

The researcher attributes these results to the nature of the exercises used in therapeutic exercises, as a large part of them was mainly intended to strengthen the most important back muscles, including the gluteal, sacral and femoral muscles, which led to this remarkable development in this characteristic of the back muscles and thigh muscles as shown in Table (2,3). As (the possibility of strength growth of muscle groups relates primarily to the efforts made by these groups in daily life)

This remarkable development occurred in strength as a result of using exercises based on the gradual increase in repetitions from low repetitions and then medium repetitions until reaching semi-high repetitions, taking into account the

recovery process during the increase in repetitions, as (Matthews and Fox 1981) indicates that (continuous effort Or the use of muscles in an organized way for training gives the individual the potential incentive to increase the level of strength), in addition to the fact that the special exercises used relied on mobile and stationary exercises, which had a clear impact on developing strength and was the most reliance on mobile exercises, which led to a reduction in the variance in Characteristic of the muscular strength of the sample members. As for the increase in the development of endurance of the abdominal muscles, as shown in Table (4), the researcher attributes to:

- The researcher, in all the weeks of exercises, focused on exercises to strengthen the muscles working on the spine, especially the front muscles because of their importance in preventing injury and pain.
- The method of performance was slow and with little resistance with the goal of developing the length of the force, and accordingly (the ability of the body's systems to resist fatigue during continuous effort, which is characterized by its long periods and its association with levels of muscular strength)

Therefore, we find that the strength variable in these exercises is related to the

strength of muscular endurance, so we find that the two have gained morale.

As for the flexibility variable as in Table (5), the significance in this variable is the result of the moving exercises used in the therapeutic exercises, as they work to increase the flexibility of the joints, ligaments and muscles working on them, and the fact that determining the kinetic range of the joints is the first visible symptom after a lower pain condition. Back due to muscle spasm as a result of worsening pain.

Therefore, the mobile exercises worked to increase the flexibility of the front of the spine, as the sources proved (that the mobile exercises work on developing muscular strength in addition to flexibility and muscular endurance)

As for the strength extension of the trunk muscles, as in Table (6), the researcher attributes this development to the nature of some of the exercises used, during which the gradual increase in the repetition of the exercises was relied on in the development of muscle strength and length, i.e. the gradient from low repetitions to medium repetitions and then to semi-high repetitions, as (Nelson 1972) confirms that (strength training with low or medium resistance, with low or medium repetitions, works to develop strength extension)

This is in addition to what was confirmed by (Fox and Matthews 1981) in increasing the level of strength and elongation. Finally, with regard to the degree of pain, as it is clear from the presentation of the tables (7,8)

that there is a clear difference in the percentage of pain degree in the post test, where the percentage of pain degree in the post test decreased significantly than it was in the pre test.

The researcher attributes this difference to the special therapeutic exercises, which included a group of gradual exercises, which had the greatest effect in increasing the elongation of some muscles and the flexibility of some other muscles. The research sample. This indicates that the exercises worked to remove the spasm and stiffness in the first stage, which led to relieving the pain.

In the second stage, it worked to increase the strength, elongation and flexibility of the working muscles, and thus the ability to bear the burden on them. Accordingly, the degrees of pain decreased in the two positions (lying down and prone) among the members of the research sample.

## CONCLUSIONS:

- The rehabilitation curriculum exercises contributed positively to the development

of the muscles working on the spine and the lumbar region in particular.

- The rehabilitation curriculum exercises played an active role in reducing the degree of pain.
- Flexibility training contributed to a clear development in the range of motion of the research sample members.

- The prepared curriculum contributed to shortening the period of returning players to practice their sports activities.



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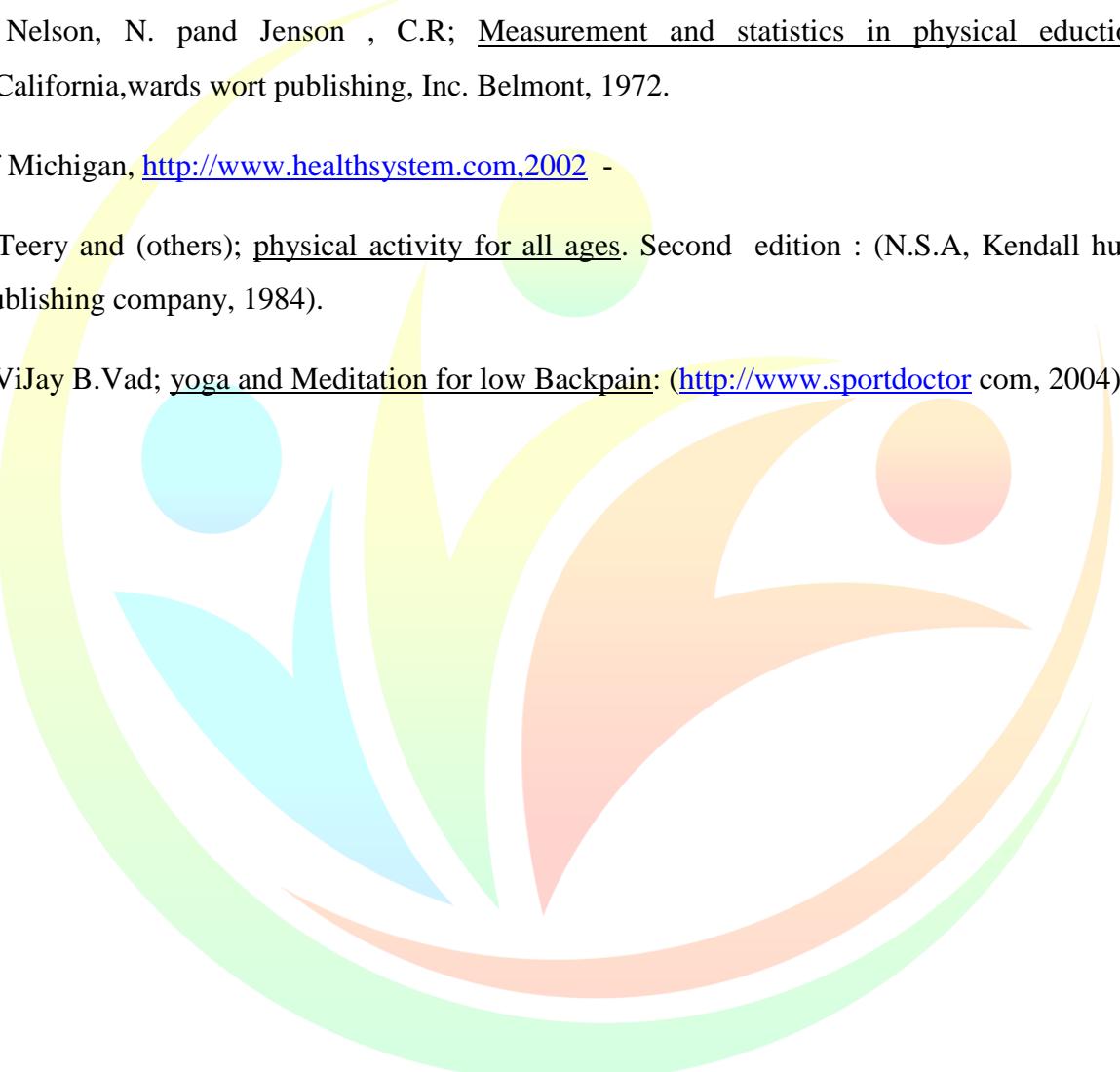
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