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The effect of early physical rehabilitation on increasing the range of motion before and after lumbar stabilization surgery

Researcher / Mustafa Reda Hussein Muhammad [(1)], Prof. Dr/ Mustafa El-Sayed Taher [(2)] , Prof. Dr / Muhammad Amer Ibrahim Amer [(3)] , Asst. Prof. Dr / Gamal Abdel Nasser Younis Mahmoud [(4)]

(1) Researcher at the doctorate level, Department of Biological and Health Sciences Sports Faculty of Physical Education for men, Alexandria University.

(2) Professor of sports injuries and physical rehabilitation Department of Biological and Health Sciences Sports- Faculty of Physical Education for men Alexandria University.

(3) Professor of Neurosurgery and Spine Department of Neurosurgery and Spine- Faculty of Medicine- Tanta University.

(4) Assistant Professor, Department of Biological and Health Sciences Sports - Faculty of Physical Education for men - Alexandria University.

Abstract

The balance of the human body depends on the vertebrae of the spine, where the greatest effort falls on the lower back area, especially the lumbar region, in which unbalanced, sudden, or wrong movements occur that expose the back to several negative factors such as (sliding of the lumbar vertebrae - tearing of the back ligaments of the vertebrae(Bruises – fractures).

The research sample was chosen by the intentional method, a purposive sample of the patients who will undergo the surgery to fix the lumbar vertebrae with the system of metal slides and screws with a movable head, and the number of 12 individuals was divided into two groups, one of them is experimental and consisted of (8) individuals and the other is a control and it consisted of (4) individuals where the program was applied Early physical rehabilitation before and after surgery on the experimental group.

The researcher used the following statistical treatments:

The arithmetic mean - the standard deviation - the torsion coefficient - the flattening coefficient - the coefficient of variation - Percentage of variances _ (v) differences for two groups _ value (q) for groups_ (ETA square) effect amount - analysis of variance for repeated measures

The following conclusions were reached:

• The impact of the early physical rehabilitation program before and after surgery on increasing the range of motion of the spine (front - back - right - left) as a result of using rehabilitative exercises and manual massage..

.***Keywords*** *:(rehabilitation, complications, lumbar)*

Introduction and research problem:

The spine in the human being is the central axis of the body, and it consists of a number of irregularly shaped and different in size vertebrae that are linked to each other and separated by fibrous cartilaginous plates that give the spine flexibility in movement so that the person can make movements easily as it is one of the most important factors in absorption The shocks are located in the center of the body and maintain the balance of the body and connect it to the lower extremity, and all parts of the body are connected to the spine directly or indirectly, and the dorsal muscles responsible for the erection of stature are also centered on it, and when the spine is exposed to injury, whether directly or indirectly, the pain affects me Movement and thus on the body's organs and on the general shape of the body.

The human body, by virtue of its composition, works with forces pressing on the bones, so each vertebra of the spine carries the burden of pressure resulting from the weight of what is above it, and since the lumbar vertebrae bear a greater burden than the dorsal vertebrae, it is natural for the pressure on these vertebrae to be greater, so it is considered more areas. Most susceptible to injury to the spine are the lumbar spine.

(Muhammad Fathy Hindi, 1991: 22), (Ahmad Helmy Saleh, Helwan 2008: 13)

Most of us suffer from sudden episodes of pain in the back from time to time, and they often last for one day or so, and you do not have to do anything about it except caution, no more, and the pain will disappear on its own after a short period, but there are people who develop attacks They have acute pain, which may hinder their life activities and their ability to work, despite the modern technologies that we have, but in most cases we are unable to determine the source of the problem, as the problem can arise as a result of damage to ligaments, muscles, or other soft tissues, However, your doctor often cannot determine the source.

Montaser Ibrahim Tarfa (2004) indicates that the spine is one of the joints that are often affected by health

problems, especially among adults. Rather, the lumbar region is one of the most affected areas, whether it is due to violent sports activities or from wrong conditions acquired through activities of daily life.
(Montaser Ibrahim Tarfa, 2004 AD: 144-145)
Mar-Colm and Read (Malcolm & Read 2007) agrees that there are some wrong postures during the performance of some professions or jobs or even when sitting and driving cars that cause injury to the lumbar region and the accompanying pain.
(Maelecom T., Read F, 2000:88-89) , (Ashraf Ramadan Hafez, Cairo, 1996 : 61)
Back injuries, especially in the lumbar region, are one of the most common and widespread injuries, especially in industrialized countries, where about 80% of the population of developing countries suffers from pain in this region in different ways at different stages of life.
(Muhammad Adel Rushdie, 1997 AD: 1), (Ahmad Abdulrahman Muhammad, 2010: 34)
The final stage that the doctor and the patient resort to after the failure of all treatments and solutions to contain injury and eliminate pain is vertebral fixation surgery, so this surgery requires early physical rehabilitation that helps the body to adapt and adapt physically to foreign bodies that have settled inside it with the system (fixing metal strips And screws with a movable head fixing the vertebrae) in a manner that ensures cooperation between natural and industrial elements and melting everyone in the crucible of functional performance in order to return to the practice of normal life, and accordingly, the surgery that we are about is performed in the case of functional deterioration of the lumbar vertebrae in a form that requires removal and fixation to ensure it Normal range of motion, also, the individual undergoing this surgery must undergo an early physical-motor rehabilitation program to help avoid late complications of surgery, in order to bring him as close as possible to his normal state before his injury.
(Mosby's, 2009: 89) (Sadat Saad Suleiman, 2002: 39)

Research objectives:

The research aims to -:
Identify the effect of an early physical rehabilitation program to reduce the complications of surgical fixation of the lumbar region in the spine through improvement of indicators:

- The motor range of the spine (forward - backward - right - left)

Research hypotheses:

In light of the objectives of the study, the researcher assumes that there are differences between the averages of the pre, intermediate and post measurements before and after stabilization surgery as a result of applying the early physical rehabilitation program to reduce the complications of the surgical fixation of the lumbar region in the spine through improvement:

- The motor range of the spine (forward - backward - right - left)

Search procedures :

- The researcher used the experimental method in order to suit the nature of the research.
- The experimental design was applied to two groups, one experimental and the other controlling by using pre, intermediate and post measurement of the research sample.
- The research was conducted at the Sports Medicine Unit of the Youth and Sports
- Directorate in Kafr El-Sheikh and the homes of the sample members. Time range: 2019/2020
- This study was conducted on an intentional sample of (12) patients who will undergo surgery to stabilize the sliding lumbar vertebrae with a fixation system (metal slides and screws with a movable head), and it was divided into two groups, one of them is an experimental number of (8) injured, on whom the early physical rehabilitation program was applied before and after the surgery. And the other is a control officer, on whom the early physical rehabilitation program was applied after surgery, and it consisted of (4) injured.

Table (1)
the statistical description of the research sample in the basic variables N = 12

Statistical connotations / Variables	Alone Measurement	Less Values	Maximum value	SMA	standard deviation	Coefficient of torsion	Flattening coefficient	Coefficient of variation%
Age	**(Year)**	**38.00**	**49.00**	**44.00**	**3.64**	**-0.37**	**-1.12**	**8.27**
Length	**(cm)**	**1.72**	**1.85**	**1.78**	**0.04**	**0.07**	**-0.39**	**2.24**
the weight	**(Kg)**	**79.00**	**94.00**	**87.08**	**3.75**	**-0.39**	**1.41**	**4.30**

It is clear from Table (1) for the statistical description of the research sample in the basic variables that the data are moderate and not dispersed and characterized by the normal distribution of the sample, where the values of the coefficient of skewness range between (- 0.39: 0.07), and the values of the coefficient of variation (2.24: 8.27), which confirms Moderation of data for the research sample.

Conditions for selecting the sample:

- Agreeing to participate in and attend the program throughout the trial period.
- They are among the injured who will undergo surgery to stabilize the sliding lumbar vertebrae with metal strips and mobile head screws.
- They are not subject to any other treatment programs.
- That the start of regularity in the program after the approval of the treating surgeon.

Methods of data collection:

A. A form for recording anthropometric data in each case and includes data (age – height -weight)
B. Clinical examination
C. A data registration form for physical measurements (the kinematic range of the spine (front, back, right, left).

Movement Range Tests:

Measurement of the range of motion of the front to bend the trunk:

1. Measuring the flexibility of the spine in front of:

The tester stands upright with feet slightly apart and knees straight.

Bending forward as much as possible slowly and within the limits of pain, while keeping the knees straight and the arms extended straight forward.

The distance between the top of the middle finger and the ground is measured in centimeters.

(Lila Abdel Aziz Zahran, 1982: 162)

2. Measuring the flexibility of the spine in succession:

From a standing position against a wall with the pelvis fixed by the belt, the tester bends the stem back as far as possible.

Register:

The distance is measured from the wall to the chin and recorded in centimeters.

(Muhammad Sobhi Hassanein, 1995: 346)

3. Measure the flexibility of the spine sideways (right - left):

- The individual stands upright with little feet apart.

Bend as far as possible while keeping the knees straight and the arm aligned with the lower limb.

The distance between the top of the middle finger and the ground is measured in centimeters.

- Do the test left and right.

(Ahmad Muhammad Sayed Ahmed, 1996: 116-118), (Lily Abdulaziz Zahran, 1982: 162)

Statistical treatments :

(Mean-Standard deviation- Coefficient of torsion Siek lines- Flattening coefficient- Coefficient of variation- Percentage of differences- (v) Differences of the tow groups - Value (P) for groups- (ETA square) the amount of the effect- Analysis of variance for repeated measurements.

First: Presentation of results:

Table (2)

Binary variance analysis for repeated measures of motion range variables N = 12

Variables	The source of the contrast	Sum of square	Degrees Freedom	Average of squares	Value (P)
The range of motion to bend the trunk forward	Measurements	2177.50	1.53	1423.21	308.05*
	Measurements * group	198.33	1.53	129.63	28.06*
	The error	70.69	15.30	4.62	
	Groups	1014.00	1.00	1014.00	70.88*
	The error	143.06	10.00	14.31	
	total summation	3603.58	29.36		
The range of motion to bend the trunk back	Measurements	386.54	3.00	128.85	341.69*
	Measurements * group	73.88	3.00	24.63	65.30*
	The error	11.31	30.00	0.38	
	Groups	198.38	1.00	198.38	48.16*
	The error	41.19	10.00	4.12	
	total summation	711.29	47.00		
The range of motion of the spine around the right	Measurements	1145.46	3.00	381.82	226.54*
	Measurements * group	184.13	3.00	61.38	36.42*
	The error	50.56	30.00	1.69	

Variables	The source of the contrast	Sum of square	Degrees Freedom	Average of squares	Value (P)
axis	Groups	425.04	1.00	425.04	55.79*
	The error	76.19	10.00	7.62	
	total summation	1881.38	47.00		
The range of motion of the spine around the left axis	Measurements	921.36	3.00	307.12	187.44*
	Measurements * group	178.86	3.00	59.62	36.39*
	The error	49.16	30.00	1.64	
	Groups	283.59	1.00	283.59	40.53*
	The error	69.97	10.00	7.00	
	total summation	1502.95	47.00		

It is evident from Table (2) for the binary variance analysis of repeated measurements of the kinematic range variables There were statistically significant differences between the averages of the four measures (Tribal - first interface - second interface - posterior) in both groups, There are also statistically significant differences between the experimental and control groups in repeated measurements of the range of motion variables , Whereas, the calculated "f " value is greater than the tabular "f " value at 0.05 level.

Table (3)

Significance of differences between repeated measures of range of motion variables in the experimental group n=8

Variables	Measurements	Average Arithmetic	Indication of differences between the averages		
			Before surgery (1 week)	After surgery (one week)	After surgery (3 months)
The range of motion to bend the trunk forward	Before surgery (1 month)	40.50	*9.25-	1.25-	*20.25-
	Before surgery (1 week)	31.25		8.00*	*11.00-
	After surgery (one week)	39.25			*19.00-
	After surgery (3 months)	20.25			
The range of motion to bend the trunk back	Before surgery (1 month)	15.25	4.88*	0.88*	9.75*
	Before surgery (1 week)	20.13		*4.00-	4.87*
	After surgery (one week)	16.13			8.87*
	After surgery (3 months)	25.00			
The range of motion of the spine around the right axis	Before surgery (1 month)	54.50	*9.50-	*3.75-	*16.75-
	Before surgery (1 week)	45.00		5.75*	*7.25-
	After surgery (one week)	50.75			*13.00-
	After surgery (3 months)	37.75			
The range of motion of the spine around the left axis	Before surgery (1 month)	51.50	*8.87-	0.88	*13.12-
	Before surgery (1 week)	42.63		9.75*	*4.25-
	After surgery (one week)	52.38			*14.00-
	After surgery (3 months)	38.38			

* D at 0.05.

It is clear from Table (3) for the significance of the differences between repeated measurements of the range of motion variables In the experimental group, there were statistically significant differences in all the variables At 0.05 level, between each of the averages:

- The post measurement and each of the means of measurement (the pre - the first interface - and the second interface) are in favor of the post measurement.
- The first intra-analogy and each of the (pre- and second intra-analogy) analogies are in favor of the first inter-analogy.
- Pre-measurement and the second intra-metering, and for the benefit of the second intermodulation in each of the tests (the range of motion of the backward bending of the torso, the movement range of the spine around the right axis).

Table (4)

Significance of differences between repeated measures of range of motion variables in the control group n = 4

Variables	Measurements	Average Arithmetic	Indication of differences between the averages		
			Before surgery (1 week)	After surgery (one week)	After surgery (3 months)
The range of motion to bend the trunk forward	Before surgery (1month)	43.25	2.50*	6.50*	*11.75-
	Before surgery (1 week)	45.75		4.00*	*14.25-
	After surgery (one week)	49.75			*18.25-
	After surgery (3 months)	31.5			
The range of motion to bend the trunk back	Before surgery (1 month)	15.25	*1.75-	*3.50-	3.50*
	Before surgery (1 week)	13.50		*1.75-	5.25*
	After surgery (one week)	11.75			7.00*
	After surgery (3 months)	18.75			
The range of motion of the spine around the right axis	Before surgery (1 month)	54.00	1.75	4.00*	*8.50-
	Before surgery (1 week)	55.75		2.25*	*10.25-
	After surgery (one week)	58.00			*12.50-
	After surgery (3 months)	45.50			
The range of motion of the spine around the left axis	Before surgery (1 month)	50.50	2.25	6.25*	*5.00-
	Before surgery (1 week)	52.75		4.00*	*7.25-
	After surgery (one week)	56.75			*11.25-
	After surgery (3 months)	45.50			

* D at 0.05.

It is clear from Table (4) for the significance of the differences between repeated measurements of the range of motion variables In the control group, there were statistically significant differences in all the variables at the level of 0.05 between each of the averages :

- The post measurement and each of the means of measurement (the pre - the first interface - and the second interface) are in favor of the post measurement.
- The first interface measurement and the second interface measurement are in favor of the first interface measurement.
- Pre-measurement and the second interface measurement in favor of the second interface measurement.
- The pre-measurement and the first intra-analogy are in favor of the pre-measurement in both (the range of motion for bending the trunk forward, and the range of motion for bending the trunk backward).

Table (5)

Percentage of differences between repeated measurements of kinematic range variables in the experimental group n = 8

Variables	Measurements	Average Arithmetic	Percentage of differences %		
			Before surgery (1 week)	After surgery (one week)	After surgery (3 months)
The range of motion to bend the trunk forward	Before surgery (1month)	40.50	22.84-	3.09-	50.00-
	Before surgery (1 week)	31.25		25.60	35.20-
	After surgery (one week)	39.25			48.41-
	After surgery (3 months)	20.25			
The range of motion to bend the trunk back	Before surgery (1 month)	15.25	32.00	5.77	63.93
	Before surgery (1 week)	20.13		19.87-	24.19
	After surgery (one week)	16.13			54.99
	After surgery (3 months)	25.00			
The range of motion of the spine around the right axis	Before surgery (1 month)	54.50	17.43-	6.88-	30.73-
	Before surgery (1 week)	45.00		12.78	16.11-
	After surgery (one week)	50.75			25.62-
	After surgery (3 months)	37.75			
The range of	Before surgery (1 month)	51.50	17.22-	1.71	25.48-

Variables	Measurements	Average Arithmetic	Percentage of differences %		
			Before surgery (1 week)	After surgery (one week)	After surgery (3 months)
motion of the spine around the left axis	Before surgery (1 week)	42.63		22.87	9.97-
	After surgery (one week)	52.38			26.73-
	After surgery (3 months)	38.38			

Table No. (5) shows the percentage of differences between the repeated measurements (pre, first intra, second intra, and post) of the range of motion variables In the experimental group, the best ratio of differences is in the post-measurement compared to the two measurements (pre and second intercourse), Also, the ratio of differences in the first inter measurement is better than the difference in the second inter measurement compared to the pre-measurement, with a higher ratio of differences between the second inter measurement and the first inter measurement in most of the motion range variables.

Table (6)

Percentage of differences between repeated measures of kinematic range variables in the control group N = 4

Variables	Measurements	Average Arithmetic	Percentage of differences%		
			Before surgery (1 week)	After surgery (one week)	After surgery (3 months)
The range of motion to bend the trunk forward	Before surgery (1month)	43.25	5.78	15.03	27.17-
	Before surgery (1 week)	45.75		8.74	31.15-
	After surgery (one week)	49.75			36.68-
	After surgery (3 months)	31.50			
The range of motion to bend the trunk back	Before surgery (1 month)	15.25	11.48-	22.95-	22.95
	Before surgery (1 week)	13.50		12.96-	38.89
	After surgery (one week)	11.75			59.57
	After surgery (3 months)	18.75			
The range of motion of the spine around the right axis	Before surgery (1 month)	54.00	3.24	7.41	15.74-
	Before surgery (1 week)	55.75		4.04	18.39-
	After surgery (one week)	58.00			21.55-
	After surgery (3 months)	45.50			
The range of motion of the spine around the left axis	Before surgery (1 month)	50.50	4.46	12.38	9.90-
	Before surgery (1 week)	52.75		7.58	13.74-
	After surgery (one week)	56.75			19.82-
	After surgery (3 months)	45.50			

Table No. (6) shows the percentage of differences between the repeated measurements (pre, first intra, second intra, and post) of the range of motion variables In the control group, the best ratio of differences is in the telemetry compared to the other three measurements in all the range of motion variables.

Table (7)

Significance of differences between the experimental and control groups in repeated measurements of the range of motion variables n = 12

Variables	Measurements	SMA		Difference averages)	Value (f)	indication Moral	Percentage of differences%
		Experimental	Control				
The range of motion to bend the trunk forward	Before surgery (1 month)	40.50	43.25	2.75-	2.22	0.17	6.36
	Before surgery (1 week)	31.25	45.75	14.50-	116.20*	0.00	31.69
	After surgery (one week)	39.25	49.75	10.50-	76.86*	0.00	21.11
	After surgery (3 months)	20.25	31.50	11.25-	92.47*	0.00	35.71
The range of motion to bend the	Before surgery (1 month)	15.25	15.25	0.00	0.00	1.00	0.00
	Before surgery (1 week)	20.13	13.50	6.63	73.73*	0.00	32.94
	After surgery (one week)	16.13	11.75	4.38	66.94*	0.00	27.15

Variables	Measurements	SMA		Difference averages)	Value (f)	indication Moral	Percentage of differences%
		Experimental	Control				
trunk back	After surgery (3 months)	25.00	18.75	6.25	50.20*	0.00	25.00
The range of motion of the spine around the right axis	Before surgery (1 month)	54.50	54.00	0.50	0.24	0.64	0.92
	Before surgery (1 week)	45.00	55.75	10.75-	56.29*	0.00	19.28
	After surgery (one week)	50.75	58.00	7.25-	50.97*	0.00	12.50
	After surgery (3 months)	37.75	45.50	7.75-	97.07*	0.00	17.03
The range of motion of the spine around the left axis	Before surgery (1 month)	51.50	50.50	1.00	0.57	0.47	1.94
	Before surgery (1 week)	42.63	52.75	10.13-	95.50*	0.00	19.20
	After surgery (one week)	52.38	56.75	4.37-	22.56*	0.00	7.70
	After surgery (3 months)	38.38	45.50	7.13-	64.85*	0.00	15.67

* The tabular "f" value at a significance level of 0.05 = 2.73

It is clear from Table (7) regarding the significance of the differences between the experimental and control groups in repeated measurements of the range of motion variables The presence of statistically significant differences between the two groups in each of the averages of the repeated measurements (first intermodal - second intermediate - dimensional) and in favor of the experimental group in all variables, Since the calculated value of "q" is greater than the tabular "f" value at the level of 0.05, While there are no statistically significant differences between the experimental and control groups in the means of pre-measurement for all variables Which indicates the equivalence of the two groups. It is also evident from the table that the highest percentage of differences between the two groups was in the first intercalary measurement (one week before surgery) in all variables except for the range of motion for forward bending of the torso as the highest percentage of differences between the two groups was in the telemetry (three months after surgery).

Table (8)
The size and amount of the effect on the dynamic range variables

Dynamic range variables	Research sample n = 12	
	Impact amount (ETA square	Effect size
The range of motion to bend the trunk forward	0.876	strong
The range of motion to bend the trunk behind	0.828	strong
The range of motion of the spine around the right axis	0.848	strong
The range of motion of the spine on the left axis	0.802	strong

Impact size and magnitude: (weak effect = 0.01), (moderate effect = 0.06), (strong effect = 0.13 or more)

It is clear from Table (8) for the size and amount of the effect on the dynamic range variables that the effect size of the applied program was strong in all variables and the effect amount ranged between (0.802: 0.876).

Second: Discussing the results:

By reviewing the results of Table (2), (3), (4), (5), (6), (7), (8) and the graph (1), (2), (3), (4) which states "There are differences between the averages of pre and post measurements before and after stabilization surgery as a result of applying the early physical rehabilitation program to reduce complications of surgical fixation of the lumbar region in the spine in favor of telemetry in the motor range of the spine (front - back - right - left)).

Table No. (6) regarding the significance of the differences between the experimental and control groups in the repeated measurements of the range of motion variables shows the existence of statistically significant differences between the two groups in each of the averages of the repeated measurements (first intermodal - second intermodal - dimensional) and in favor of the experimental group in all the variables. The calculated value of "q" is greater than the tabular "q" value at the level of 0.05, while there are no statistically significant differences between the experimental and control groups in the averages of the pre-measurement for all variables, which indicates the parity of the two groups. As it is evident from the table that the highest percentage of differences between the two groups was In the first intercalary measurement (one week before surgery) in all variables, with a percentage of differences (31.69% - 32.94% - 19.28%) except for the range of motion for forward torso bending where the highest percentage of differences between the two groups was in the telemetry (three months after surgery) By a percentage of differences (35.71%).

It is clear from Table (7) for the size and amount of the effect on the dynamic range variables that the effect size of the applied program was strong in all variables and the effect amount ranged between (0.802: 0.876).

It is evident from Table No. (4) for the percentage of differences between the repeated measurements (pre-, first inter-, second-, and post-measurements) of the range of motion variables in the experimental group that the best ratio of differences is in the post- measurement compared to the two measurements (the tribal and the second intermediate). The differences in the first inter measurement are better than the differences in the second inter measurement compared to the pre-measurement, with a higher ratio of differences between the second inter measurement and the first inter measurement in most of the motion range variables.

The researcher attributes this improvement to the impact of the early physical rehabilitation program on the research sample and the rehabilitative exercises it included that helped improve the range of motion (forward - backward - right - left) in the injury area, which led to an increase in the range of motion and a reduction in the percentage of pain on the lumbar spine. Also, the improvement in the dynamic range variables was before and after surgery as a result of implementing the early physical rehabilitation program and

what it contained in terms of rehabilitation exercises and the method of its implementation, which proves the validity of the hypothesis related to the improvement of the range of motion as a result of the effect of the early rehabilitation program on the research sample.

A study by Frank et al. Frank, et al (1987) (15), Rosen, et al (1992) (16), Mu'taz Billah Hassanein (1992), Makkharhy, et al., Mc-Carthy, et al (1993) (13) that the interest in rehabilitation before and after the operation and the use of Movement in the early stage led to the following results:

- Decreased pain rate in the acute period.
- Reducing the number of medications given to relieve pain.
- Increase the range of motion.
- Decreased muscle spasms.

And it is in agreement with the study of "David LP" (2007 AD) "94) Talib Jasim" (2011 AD) that rehabilitative exercises have a major role in increasing the range of motion, which is positively reflected in reducing the severity of pain.

The results of the studies of Maha Ahmad (2003), Souad Khairy (2004 CE), Aida Muhammad (2012), and Ahmed Abd al-Salam (2013) indicate that the practice of rehabilitative exercises leads to improved flexibility and increased range Al-Kinky, and this is consistent with the results of the study "Ahmed Abdel Salam Atito Abu Al-Hassan" (2006 AD), the study of "Mahmoud Farouk Sabra" (2006 AD), and the study of "Mustafa Ibrahim Ahmed" (2006 AD) where studies have shown that the physical rehabilitation program using exercises has a wide impact on The motion range returns to normal.

Results also showed with both (flynn 1995) (84) (Harre lson 1991) (15) that the components of the early physical rehabilitation program, such as rehabilitation and movement exercises, help to develop physical fitness and range of motion, which helped to speed up the return to the level closest to the naturalness of the individual and the exercise of his life Natural and normal, and this is consistent with the results of (Kathryn. Bartot 2010) that rehabilitative exercises for the iliac psoas muscle help to improve the function of the lumbar spine and increase the range of motion of the trunk.

The results of the study (Kiapour, Ali 2010) showed a significant improvement in the range of motion of the spine as a result of proposing a new combination that included preserving the posterior disc identical to the frontal disc, and using an early rehabilitation program before and after surgery in which it was proven to improve the pressure and rotation centers of the lumbar vertebra mechanically.

The researcher attributes this to the effect of the early physical rehabilitation program before and after the surgery, and the dynamic and static rehabilitation exercises it contained, helped to lengthen the ligaments and muscles working on the spine in general and the lumbar vertebrae in particular and to strengthen these muscles in a way that increased the range of motion of the vertebrae articulated in the spine and flexibility The lumbar region, where the improvement rates in the experimental group measurements increased over the control due to the application of the early physical rehabilitation program before and after the surgery, which had an effective and positive effect on the research sample.

Conclusions:

In light of the objectives and results of the research and within the limits of the research sample and its characteristics, and based on the statistical treatments, the early physical rehabilitation program and the available capabilities of the tools used, and after presenting and interpreting the results, the researcher could reach the following conclusions:

- The effect of the early physical rehabilitation program before and after surgery to improve the range of motion of the spine (front - back - right - left) as a result of using rehabilitative exercises and manual massage in a standardized manner and with different intensities, which had an effective and positive effect in improving cases as quickly as possible.

Recommendations:

In light of the objectives and hypotheses of the research, and within the limits of the sample description and the statistical treatments used, and through the results of the experiment and its discussion, the researcher can recommend the following:

- Being well aware of the patient history of cases accurately and the details of the surgery procedure.
- Beginning physical rehabilitation early, as the individual undergoing physical rehabilitation programs early before and after surgery helps reduce pain in the acute period and widens the space between the vertebrae and also helps improve the state of health and mobility.
- Paying attention to muscular endurance, stretching and range of motion exercises, and performing treatments and exercises that reduce the degree of pain.
- Continuing to perform rehabilitative exercises even after the proposed rehabilitation program has been completed, as a preventive measure and to ensure further improvement and reduce complications.
- Directing researchers to carry out studies similar to this study at different age stages, for women as well, and to use other rehabilitation methods early for their effective effect on reducing complicati

References:

1. **Sadat Saad Soliman (2002) :** A proposed physical therapy program in cases of back surgery failure syndrome for some cases of lumbar herniated disc, Master thesis, Faculty of Physical Therapy, Cairo University.
2. **Ahmed Helmy Saleh (2008) :** The effect of cupping therapy on patients with lower back pain in cases of herniation Cartilage in the light of the physical and physical parameters of the sites of resistance and the points desired With blood, PhD thesis, Faculty of Sports Education, Helwan.
3. **Ahmed Abdel Rahman Mohamed (2010) :** The effect of therapeutic massage and cupping on lower back pain for some athletes, Master Thesis, College of Physical Education for Boys in Al-Haram, Cairo.
4. **Ahmed Mohamed Sayed Ahmed (1996) :** The impact of a proposed program to rehabilitate the back muscles after a lumbar cartilage resection Unpublished PhD thesis, Port Said College of Physical Education, Suez Canal University.
5. **Aida Muhammad Husayn Sharif (2012) :** The Effect of Aerobic Exercise Program Using Massage on Weight Loss and Functional Efficiency of Obese Women, Unpublished Master Thesis, Faculty of Physical Education, Tanta University.
6. **Lila Abdel Aziz Zahran (1982) :** The impact of a proposed movement program on relieving lower back pain Published research, Studies and Research Journal, Helwan University, Fifth Volume, Issue The third, August .
7. **Montaser Ibrahim Tarfah (2004) :** The Impact of Using a Suggested Water Rehabilitation Program on Rehabilitation of Casualties Lumbar Ligaments ", published research, Journal of Theories and Applications, the fifty-first issue Faculty of Physical Education for Boys, Abu Qir, Alexandria University, Alexandria.
8. **Moataz Billah Hassanein (1992) :** The effect of a proposed program to rehabilitate the affected knee joint with anterior cruciate ligament, Faculty of Physical Education for Boys, Alexandria University.
9. **Muhammad Fathy Hendi (1991) :** Medical Anatomy for Athletes, Arab Thought House, Cairo.
10. **Muhammad Sobhi Hassanein (1995):** Measurement and Evaluation in Physical Education and Sports, ed The third, part one, Arab Thought House, Cairo.
11. **Mohamed Adel Roushdy, Mohamed Gaber Berekaa (1997) :** The Mechanics of Spinal Injury, Al Maarif Institution, Alexandria.
12. **Mosby 's (2009) .** Cupping . Medical Dictionary , 9th edition Elsevier
13. **Kiapour, A. (2010).** Investigation into Lumbar Spine Biomechanics of 360 Motion Preservation Systems. (Electronic Thesis or Dissertation).
14. **Flynn.c (1995) :** Clinical application .inzuluaga m.et alceditions sports physiotherapy . Churchill. Living stone.
15. **Harre lson G (1991) :** Physical rehabilitation of the injuried athlete w. B . sounders company London .
16. **Dyson Hamer (2001):** Low Back Pain Mechanisms Treatment, lyle J. iecheli and Preventution www.sportei.com.