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RESEARCH ARTICLE

CORE STABILITY PROGRAM VERSUS INTENSIVE EXERCISES AFTER LUMBAR DISCECTOMY.

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Abstract

Introduction: Discectomy is a surgical technique used for treatment of lumbar disc herniation. After the surgery; the patient suffers from back pain and limitation of motion which affect his functional ability.

Purpose: The purpose of this study was to compare between the effect of core stability program and the effect of a intensive exercises on the L4-5 segmental lumbar flexion and the functional disability in patients with lumbar discectomy.

Methods: Thirty male patients with L4-L5 open discectomy were divided on two groups; group (A) received core stability program, while group (B) received a intensive exercises. Treatment was applied for 12 sessions.

Results: The results of this study revealed a significant difference of both variables in each of the groups, after treatment. There was also a significant difference of both variables between group (A) and group (B) after treatment. The improvements after core stability program were significantly more than after the intensive exercises. **Conclusion:** From the obtained results of the study, it can be concluded that L4-5 segmental lumbar flexion improved and the functional disability reduced after receiving core stability program and after receiving intensive exercises, but the patients who received the core stability improved more than patients who received the intensive exercises.

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Introduction:-

Back pain is one of the most common musculoskeletal disorders. Back pain and its associated problems such as muscle spasm, limitation of motion and altered functional ability can significantly affect an individual's quality of life. Pain may indicate a specific pathology as lumbar disc prolapse or occurs after back surgery. This pain in turn alters the segmental motion as well as the total motion of the lumbar spine ***(Kulig et al., 2007).***

Lumbosacral radicular syndrome is a condition commonly caused by lumbar disc prolapse, it is characterized by radiating pain to the area of buttocks or legs due to tension on one or more lumbosacral nerve roots by the prolapsed or herniated disc ***(Ostelo et al., 2009).***

Discectomy is a surgical technique used for treatment of lumbar disc herniation, it is indicated if there is progression of the neurological deficits of the patient or failure of using the conservative treatment, it is performed by many techniques, one of them is open discectomy. After the surgery; the patient suffers from back pain and limitation of motion which affect his functional ability ***(Celik et al., 2008).***

Clinical subjective methods are used to evaluate the segmental motion as manual application of a posterior to anterior force on the vertebral spinous processes, or palpation of movement between spinous processes during flexion-extension of the trunk. In both cases; the amount of motion, or resistance to force is assessed using

subjective categories of hypomobile, normal, or hypermobile ***(Kulig et al., 2007).*** Spinal Mouse is an objective reliable and valid electromechanical device; it is used to assess the sagittal profile of the spine, the segmental and the total motion of the thoracic and the lumbar spines ***(Mannion et al., 2004).***

The functional disability can be assessed using different scales such as Modified Oswestry Low Back Pain Disability Scale, Quebec Back Pain Disability Scale, The Roland-Morris Disability Questionnaire, The Waddell Disability Index, and The Physical Health Scales. Modified Oswestry Scale and Quebec Scale are the most reliable scales. Modified Oswestry Scale is more responsive for the patients than Quebec Scale ***(Fritz & Irrgang, 2001).***

Many rehabilitative programs are used to reduce the functional disability of the patients after discectomy, as conventional methods (massage, ultrasound, wax bath, infrared, stretching exercises and strengthening exercises) ***(Soliman, 2002).*** Also dynamic lumbar stabilization program or core stability program (stabilizing technique of the back with motion of the extremities) ***(Filiz et al., 2005)*** is used to reduce the functional disability of the patients after discectomy. This technique activates the stabilizing muscles (deep and superficial muscles) which are responsible for keeping of the body in upright posture and resist external forces that act on the body. Core Stability training depends on the basic principles of learning motor control first by developing awareness of muscle contractions and spinal position, then by developing control in simple patterns and exercises and progressing to complex exercises and finally by demonstrating automatic maintenance of spinal stability and control in a progression of simple functional activities to complex and unplanned situations ***(Kisner & Colby, 2007).***

Many exercices programs were used after lumbar discectomy such as Mckenzie and Williams programs ***(Filiz et al., 2005)***, stretching of the back muscles, extension exercises and flexion exercises ***(Soliman, 2002).*** But there was a lack in the studies that compare between effect of exercises and core stability on the L4-5 segmental lumbar flexion and the functional disability of these patients. So purpose of this study was to provide knowledge that may assist clinicians in assessment and treatment of these patients.

Patients and methods:-

Thirty male patients, aged 20-40 years, with L4-L5 open discectomy participated in this study, and were divided into two groups: Group (A) received continuous wattage ultrasound and core stability program, and group (B) received continuous wattage ultrasound and intensive exercises. Treatment was applied for 12 sessions, 3 sessions per week.
This study was carried out to investigate the L4-5 segmental lumbar flexion and the functional disability after 4 weeks of lumbar discectomy (as the best time for starting of the rehabilitation programs), then the investigation was applied again after 8 weeks from the surgery as the time of finishing the treatment programs.

Assessment:

1- Spinal Mouse:

Spinal Mouse is a hand-held computer-assisted electromechanical device which can be used to measure spinal curvatures in various postures, sagittal back shape and spinal motion (figure 1). The device is manually guided paravertebrally along the spine of the subject. The system records the outline of the spinal column from spinous process of C7 to S3 in the sagittal plane, from standing position with flexion. The local angle or inclination relative to a perpendicular line is given at any position by an internal pendulum connected to a potentiometer. An intelligent recursive algorithm computes information from the potentiometer ***(Mannion et al., 2004).***

Figure (1): The Spinal Mouse.

2- Modified Oswestry Low Back Pain Disability Scale:-

Modified Oswestry Scale (OSW) is designed to assess the magnitude of change in the functional ability or level of the functional disability related to low back pain at the patients over time. Modified (OSW) (Appendix) consists of 10 items which ask the patient to rate his perceived level of disability for several fundamental tasks of daily living (e.g., pain intensity, sleeping, personal care, walking, sitting, standing, social life, traveling, homemaking and lifting). Each item is scored from 0 to 5, with higher values representing greater disability. The total score is multiplied by 2 and expressed as a percentage ***(Fritz & Irrgang, 2001).***

Treatment:

1-Continuous wattage ultrasound: It was used with continuous mode directly over the scar, dose 1.5 w/ cm square for 5-6 minutes (Min), frequency 1 mega hertz (MHz).

2-Core stability program *(Kisner & Colby, 2007)*(group A):

a- Core stability emphasis on abdominals:

Level (1): From crook lying; the patient was asked to hollow his abdomen about 10 sec, then to press his back against bed about 10 sec and then to apply posterior pelvic tilting about 10 sec, to activate the stabilizing muscles then he was asked to relax.

Level (2): From supine lying; the patient was asked to flex both knees 90 degrees to be in crook lying by sliding heels on the plinth using powder to facilitate the motion, then the patient was asked to maintain the position one min then relax. He repeated the exercise 5 times per session.

Level (3): From crook lying; the patient was asked to support one leg on the bed, lift the another bent leg to 90 degrees hip flexion and then to extend this knee by sliding heel on the bed and to lift the straight leg 45 degrees up, he was asked to maintain each motion one min then relax. He repeated the exercise 5 times per session with alternation from side to side.

Level (4): From crook lying; the patient was asked to hold the supported leg at level 3 by his hands to get it in 90 degrees hip flexion**,** lift the another bent leg to 90 degrees hip flexion then to extend this knee by sliding heel on the bed and to lift the straight leg 45 degrees up, he was asked to maintain each motion one min then relax. He repeated the exercise 10 times per session with alternation from side to side.

Level (5): Same level 4 but one leg was lifted to gain flexion hip 90 degrees without patient's hands (without support). He repeated the exercise of level 4, 10 times per session with alternation from side to side.

b- Core stability emphasis on back extensors:

Level (1): From quadruped position; the patient was asked to flex one upper extremity and to maintain the position one min then relax. He repeated the exercise 5 times per session with alternation from side to side.

Level (2): From quadruped position; the patient was asked to extend one lower extremity by sliding it along the bed and to maintain the position one min then relax. He repeated the exercise 5 times per session with alternation from side to side.

Level (3): From quadruped position; the patient was asked to extend one lower extremity**,** lift it up to15- 20 centimeter (cm) from the bed and to maintain the position one min then relax. He repeated the exercise 10 times per session with alternation from side to side.

Level (4): From quadruped position; the patient was asked to flex one upper extremity, extend the contralateral lower extremity and to maintain the position one min then relax. He repeated the exercise 10 times per session with alternation from side to side.

Level (5): From prone lying position; the patient was asked to extend one lower extremity and to maintain the position one min then relax. He repeated the exercise 10 times per session with alternatation from side to side.

Level (6): From prone lying position; the patient was asked to extend both lower extremities and to maintain the position one min then relax. He repeated the exercise 10 times per session, and then the repetition was increased to reach 15 repetitions per session.

Intensive Exercises *(Kisner & Colby, 2007)*(group B):

a- Self stretching of the back:

From crook-lying; the patient was asked to bring one knee and then the other toward the chest, clasp the hands around the thighs, and pull them toward the chest; elevating the sacrum off the bed. He was asked to maintain the position for 30 sec then relax; this was repeated about 3 times per session.

b- Self stretching of the hamstring:

The patient was in long sitting position, the patient was asked to stabilize one lower limb by putting the contralateral hand just above the knee of the stretched side, then he was asked to try to touch the toes of this foot by his hand as possible as he can, maintaining of the position was 30 sec then he relaxed. The patient performed the exercise to the other side with same time of maintaining then he relaxed, repetition of the exercise was 3 times for each side**.**

c- Extension exercises:

Passive extension:-

Patient position was prone, with placing pillows under the abdomen for support. Gradually increase of the amount of extension was applied by removing the pillows and then the extension was progressed by asking the patient to extend trunk up on the elbows, allowing the pelvis to sag, pillows were placed under the thorax to help take strain off the shoulders, the position was maintained for 5 min, the patient repeated the exercise 5 times per session then the repetition increased to 10 times per session. The progression of the exercise was achieved by asking the patient to raise himself up on the hands, allowing the pelvis to sag.

Dynamic extension:

1- Thoracic elevation: The patient was in prone position with extended arms forward, therapist stabilized the lower extremities and asked the patient to perform chin in with lifting head and thorax away from the bed as possible, the patient was asked to maintain the position for 5 min then relax, he repeated the exercise 5 times per session, the progression of the exercise was by asking the patient to clasp his hands behind the head and perform the exercise, he repeated the exercise 5 times per session then repetition increased up to 10 times per session.

2- Leg lift: The patient was in prone position, he stabilized himself by holding the sides of the treatment table, he was asked to lift one leg up in extended manner then to alternate this with the another leg, then to lift both legs at the same time. Time of maintaining of any position was 5 min, the patient repeated each motion 5 times per session, and then repetition of the exercise increased gradually up to 10 times per session.

3-

Statistical analysis:

Comparisons regarding the segmental motion:

1-Comparison of the L4-5 segmental lumbar flexion in group (A):

Paired t test was used to show difference between the mean values of the L4-5 segmental lumbar flexion before and after the rehabilitation in group (A).

This test revealed that there was a statistical significant difference between before the rehabilitation with mean of 2.20 (±0. 94) degrees and after the rehabilitation with mean of 8.60 (±1.45) degrees with t-value = -25.149 and P value = 0.001 (table 1).

Table(1):Comparison between mean L4-5 segmental lumbar flexion values before and after the rehabilitation in group (A).

	Mean	SD	t-value	P value
Before the rehabilitation	2.20	0.94	-25.149	0.001 significant
After the rehabilitation	8.60	1.45		

2-Comparison of the L4-5 segmental lumbar flexion in group (B):

Paired t test was used to show difference between the mean values of the L4-5 segmental lumbar flexion before and after the rehabilitation in group (B).

This test revealed that there was a statistical significant difference between before the rehabilitation with mean of 1.87 (±0.83) degrees and after the rehabilitation with mean of 5.73 (±1.33) degrees with **t**-value = -17.960 and **P** value = 0.001 (table 2).

Table(2):Comparison between mean L4-5 segmental lumbar flexion values before and after the rehabilitation in group (B).

	N	Mean	SD	t-value	P value
Before the rehabilitation	15	1.87	0.83	-17.960	0.001 significant
After the rehabilitation		5.73	1.33		

3-Comparison of L4-5 segmental lumbar flexion before the rehabilitation of both groups:

Unpaired t test was used to show difference between the two groups as regards the L4-5 segmental lumbar flexion.

This test revealed that before the rehabilitation; there was no statistical significant difference between the mean value of group (A) 2.20 (± 0.94) degrees and the mean value of group (B) 1.87 (± 0.83) degrees with **t**-value = 1.027 and **P** value = 0.313 (table 3).

Table (3):Comparison between mean L4-5 segmental lumbar flexion values before the rehabilitation of both groups.

	N	Mean	SD	t-value	P value
L4-5 segmental lumbar flexion before the rehabilitation in group(A)	15	2.20	0. 94	1.027	0.313 (NS)
L4-5 segmental lumbar flexion before the rehabilitation in group (B)	15	1.87	0.83		

NS= Not significant.

4-Comparison of L4-5 segmental lumbar flexion after the rehabilitation of both groups:

Unpaired t test was used to show difference between the two groups as regards the L4-5 segmental lumbar flexion.

This test revealed that after the rehabilitation; there was a statistical significant difference between the mean value of group (A) which is 8.60 (± 1.45) degrees and the mean value of group (B) which is 5.73 (± 1.33) degrees with **t**-value = 5.625 and **P** value = 0.001 (table 4).

Table (4):Comparison between mean L4-5 segmental lumbar flexion values after the rehabilitation of both groups.

	N	Mean	SD	t-value	P value
L4-5 segmental lumbar flexion after the rehabilitation in group(A)	15	8.60	1.45	5.625	0.001 significant
L4-5 segmental lumbar flexion after the rehabilitation in group (B)	15	5.73	1.33		

❖ **Comparisons regarding the functional disability:**

1-Comparison of the functional disability in group (A):

Paired t test was used to show difference between the mean values of the functional disability before and after the rehabilitation in group (A).

This test revealed that there was a statistical significant difference between before the rehabilitation with mean of 41.73 (±7.85) percent and after the rehabilitation with mean of 16.27 (± 6.54) percent with **t**-value = 32.154 and **P** value = 0.001 (table 5).

Table(5):Comparison between mean functional disability values before and after the rehabilitation in group (A) and group (B).

	N	Mean	SD	t-value	P value
Before the rehabilitation	15	41.73	7.85	32.154	0.001 significant
After the rehabilitation		16.27	6.54		

2-Comparison of the functional disability in group (B):

Paired t test was used to show difference between the mean values of the functional disability before and after the rehabilitation in group (B).

This test revealed that there was a statistical significant difference between before the rehabilitation with mean of 42.27 (± 11.11) percent and after the rehabilitation with mean of 24.53 (± 8.47) percent with t-value = 21.495 and P value = 0.001 (table 6).

Table(6): Comparison between mean functional disability values before and after the rehabilitation in group (B).

	N	Mean	SD	t-value	P value
Before the rehabilitation	15	42.27	11.11	21.495	0.001 significant
After the rehabilitation		24.53	8.47		

3-Comparison of the functional disability before the rehabilitation of both groups:

Unpaired t test was used to show difference between the two groups as regards the functional disability.

This test revealed that before the rehabilitation; there was no statistical significant difference between the mean value of group (A) 41.73 (± 7.85) percent and the mean value of group (B) 42.27 (± 11.11) percent with t-value = -0.152 and P value = 0.880 (table 7).

Table(7):Comparison between mean functional disability values before the rehabilitation of both groups.

	N	Mean	SD	t-value	P value
Functional disability before the rehabilitation in group(A)	15	41.73	7.85	-0.152	0.880 (NS)
Functional disability before the rehabilitation in group(B)	15	42.27	11.11		

NS= Not significant.

4-Comparison between the mean values of the functional disability after the rehabilitation of both groups:

Unpaired t test was used to show difference between the two groups as regards the functional disability. This test revealed that after the rehabilitation; there was a statistical significant difference between the mean value of group (A) 16.27 (± 6.54) percent and the mean value of group (B) 24.53 (± 8.47) percent with t-value = -2.992 and P value = 0.006 (table 8).

Table(8):Comparison between mean functional disability values after the rehabilitation of both groups.

	N	Mean	SD	t-value	P value
Functional disability after the rehabilitation in group(A)	15	16.27	6.54	-2.992	0.006 significant
Functional disability after the rehabilitation in group(B)	15	24.53	8.47		

Discussion:-

Discectomy is a surgical technique used for treatment of lumbar disc herniation, it is indicated if there is progression of the neurological deficits of the patient or failure of using the conservative treatment.

Early intervention of a rehabilitation program 4-6 weeks post operative is effective in helping patients with lumbar discectomy to reduce their pain, reduce their functional disability and restore their normal lumbar flexion motion.

The purpose of the study was to compare between the effect of core stability program and the effect of a intensive exercises on the L4-5 segmental lumbar flexion and the functional disability in patients with lumbar discectomy.

The first parameter in this study was the L4-5 segmental lumbar flexion. Before starting of the rehabilitation programs; there was flexion hypomobility at L4-L5 segment in relation to normal values which were detected by Spinal Mouse.

The study results are similar to results of Beneck and his colleagues **(Beneck et al., 2005)**; they found hypomobility at L4-L5 segment during assessment of segmental lumbar motion in chronic low back patients.

On other hand the study results disagreed with Kulig and his colleagues ***(Kulig et al., 2007)*** , they stated that; there was hypermobility at L4-L5 segment, this disagreement because they measured the segmental lumbar motion from non specific low back pain patients who had different causes of pain.

The study results also disagreed with ***Morsi (2010),*** she stated that; there was hypermobility at L4-L5 segment, this difference was due to measuring of the segmental lumbar motion from degenerative disc patients who had segmental instability.

It was found that there was a statistical significant difference between before and after the rehabilitation regarding to L4-5 segmental lumbar flexion in group (A). Regarding this comparison; the study results agreed with Manniche and his colleagues **(Manniche et al., 1993)**.They stated that using of core dynamic trunk exercises for patients with low back pain due to first discectomy causes improvement in the spinal flexibility.

With comparing the L4-5 segmental lumbar flexion between before and after the rehabilitation in group (B) it was found that the L4-5 segmental lumbar flexion increased significantly after the intensive exercises more than before the exercises. Regarding this comparison; the study results agreed with Rainville and his colleagues **(Rainville et al., 2004)**.They stated that patients with low back pain and weak back muscles improved in flexion and extension ranges using lumbar extension exercises.

Another comparison between the L4-5 segmental lumbar flexion after the rehabilitation in group (A) and after the rehabilitation in group (B) was performed; there was a statistical significant difference between them. The L4-5 segmental lumbar flexion increased after the rehabilitation in group (A) more than after the rehabilitation in group (B).
The second parameter in this study was the functional disability. Patients after discectomy had certain degrees of functional disability referred to surgical intervention, pain, weak back muscles and patient's feeling toward the surgery and probability of reoperation again.

Paired t test was used to show difference between the mean values of this variable before and after the rehabilitation in group (A).The test found that there was a statistical significant difference between before and after the core stability program in group (A). The functional disability decreased significantly after the core stability program more than before it. Regarding this comparison; the study results agreed with Bendix and his colleagues **(*Bendix et al., 1997)***, they stated that using of core stability program for 3 weeks with chronic low back pain patients reduced the functional disability and causes early returning to the work. Also the results were supported by Hides and his colleagues ***(Hides et al., 1996)***, they found that using of stability exercises for multifidus muscle reduced the functional disability of low back patients and help them to restore stability of the spine. Results of Taimela and his colleagues ***(Taimela et al., 2000)*** agreed with the study result, they found significant reduction in the functional disability after using strengthening exercises for multifidus muscle using core stability program .

With comparing the functional disability between before and after the rehabilitation in group (B), there was a statistical significant difference between before and after the intensive exercises. The functional disability decreased after the exercises more than before them. Regarding this comparison; the study results agreed with that of ***Jette & Jette (1996)*** they stated that; at cases of spinal impairments using of back exercises caused reduction in patient's

functional disability measured by health scales. Also there was agreement with ***Soliman (2002)***, he found that using of deep heating with sustained stretching of back muscles and strengthening of back muscles reduced pain and the functional disability in patients with lumbar discectomy. The study results were also supported by Manniche and his colleagues ***(Manniche et al., 1991)***, they found significant decrease in the pain and the functional disability after using intensive back extension exercises. There was also agreement with Johannsen and colleagues ***(Johannsen et al., 1995)***, they stated that using of dynamic back exercises combined with stretching of back muscles were effective in reducing pain and functional disability.

Another comparison between the functional disability after the rehabilitation in group (A) and after the rehabilitation in group (B) was performed; it was found that there was a statistical significant difference between them. The functional disability decreased after the rehabilitation in group (A) more than after the rehabilitation in group (B). Regarding this comparison; the study results agreed with Filiz and his colleagues ***(Filiz et al., 2005)***, they found that using of core stability program with patients undergone first time lumbar discectomy reduced the functional disability more than Mckenzie and Williams program. There was agreement with Yilmaz and his colleagues ***(Yilmaz et al., 2003)***, they found that using of core stability program with microdiscectomy patients was more effective in reduction of the functional disability than stretching and strengthening program of the back muscles. Results of this study agreed with ***Saad, (2003)*** she stated that core stability program with chronic low back pain patients was more effective in reduction of the functional disability than combined flexion – extension exercise program. O'Sullivan and his colleagues ***(O'Sullivan et al., 1997)*** also agreed with the study results because they found that lumbar stabilization program was more effective in reduction of the functional disability more than traditional program as stretching and strengthening of back muscles .

The results of this study showed that; core stability program was more effective than the intensive exercises in improvement of the L4-5 segmental lumbar flexion and reduction of the functional disability in patients with lumbar discectomy at the 8^{th} week from the surgery.

Conclusion:-

From the obtained results of the study, it can be concluded that the sagittal segmental lumbar motion at L4-L5 segment improved and the functional disability reduced after receiving dynamic lumbar stabilization program and after receiving the conventional rehabilitation program at the 8^{th} week from the surgery, but the patients who received the dynamic lumbar stabilization program improved more than patients who received the conventional rehabilitation program.

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Appendix:-

Modified Oswestry Low Back Pain Disability scale

Modified Oswestry Low Back Pain Disability Questionnaire has been designed to give your therapist information as to how your back pain has affected your ability to manage in everyday life. Please answer every question by placing a mark in the one box that best describes your condition today. We realize you may feel that 2 of the statements may describe your condition, but please mark only the box that most closely describes your current condition [5].

Pain intensity

- **I can tolerate the pain I have without having to use pain medication.**
- **The pain is bad, but I can manage without having to take pain medication**
- **Pain medication provides me with complete relief from pain.**
- **Pain medication provides me with moderate relief from pain.**
- **Pain medication provides me with little relief from pain.**
- **Pain medication has no effect on my pain.**

Personal Care (e.g., Washing, Dressing)

- **I can take care of myself normally without causing increased pain.**
- **I can take care of myself normally, but it increases my pain.**
- **It is painful to take care of myself, and I am slow and careful.**
- **I need help, but I am able to manage most of my personal care.**
- **I need help every day in most aspects of my care.**
- **I do not get dressed, wash with difficulty, and stay in bed.**

Lifting

- **I can lift heavy weights without increased pain.**
- **I can lift heavy weights, but it causes increased pain.**
- **Pain prevents me from lifting heavy weights off the floor, but I can manage if the weights are conveniently positioned (e.g., on a table).**
- **Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.**
- **I can lift only very light weights.**
- **I cannot lift or carry anything at all.**

Walking

- **Pain does not prevent me from walking any distance.**
- **Pain prevents me from walking more than 1 mile.**
- **Pain prevents me from walking more than 1⁄2 mile.**
- **Pain prevents me from walking more than 1⁄4 mile.**
- **I can only walk with crutches or a cane.**
- **I am in bed most of the time and have to crawl to the toilet**

Sitting

- **I can sit in any chair as long as I like.**
- **I can only sit in my favorite chair as long as I like.**
- **Pain prevents me from sitting for more than 1 hour.**
- **Pain prevents me from sitting for more than 1⁄2 hour.**
- **Pain prevents me from sitting for more than 10 minutes.**
- **Pain prevents me from sitting at all.**

Standing

- **I can stand as long as I want without increased pain.**
- **I can stand as long as I want, but it increases my pain.**
- **Pain prevents me from standing more than 1 hour.**
- **Pain prevents me from standing more than 1⁄2 hour.**
- **Pain prevents me from standing more than 10 minutes.**
- **Pain prevents me from standing at all.**

Sleeping o **Pain does not prevent me from sleeping well.** o **I can sleep well only by using pain medication.** o **Even when I take pain medication, I sleep less than 6 hours.** o **Even when I take pain medication, I sleep less than 4 hours.** o **Even when I take pain medication, I sleep less than 2 hours.** o **Pain prevents me from sleeping at all.**
Social Life o **My social life is normal and does not increase my pain.** o **My social life is normal, but it increases my level of pain.** o **Pain prevents me from participating in more energetic activities (e.g., sports, dancing)** o **Pain prevents me from going out very often.** o **Pain has restricted my social life to my home.** o **I have hardly any social life because of my pain.**
Traveling o **I can travel anywhere without increased pain.** o **I can travel anywhere, but it increases my pain.** o **My pain restricts my travel over 2 hours.** o **My pain restricts my travel over 1 hour.** o **My pain restricts my travel to short necessary journeys under 1⁄2 hour.** o **My pain prevents all travel except for visits to the physician/therapist or hospital.**
Employment/Homemaking o **My normal homemaking/job activities do not cause pain.** o **My normal homemaking/job activities increase my pain, but I can still perform all that is required of me.** o **I can perform most of my homemaking/job duties, but pain prevents me from performing more physically stressful activities (e.g., lifting, vacuuming).** o **Pain prevents me from doing anything but light duties.** o **Pain prevents me from doing even light duties.** o **Pain prevents me from performing any job or homemaking chores.**