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• **J. of Musculoskeletal Research (JMR)** <em@editorialmanager.com>

Kepada: Komang Agung



Kam, 26 Nov jam 15.57



Dear Professor Agung,

Upon the recommendation of the Editorial Board, you have been invited to review a manuscript for Journal of Musculoskeletal Research. The manuscript reference is WSPC-JMR-D-20-00060.

I would be grateful if you would review a paper entitled "EFFECTIVENESS OF ACTIVITY BASED EXERCISE PROGRAM ON QUALITY OF LIFE IN FARMERS WITH CHRONIC LOW BACK PAIN" for this journal.

This is the abstract:

**Purpose :** Low back pain is the most common health problem among farmers because of wrong posture, heavy lifting and work load. And farmers are not aware of ergonomic considerations of their work tasks. The aim of the study was to educate them on how to meet their daily demands with proper ADL technique will enable them to perform tasks more efficiently, limit low back pain, and enhance recovery.

**Methods:**

42 male farmers were selected as per the inclusion and exclusion criteria. Informed consent was taken after explaining them about the purpose of study. They were assessed for pre test data by using VAS and Roland – Morris disability Questionnaire. The activity based exercise program pamphlet was given to the participants. The instructions regarding the activities were thoroughly explained to them. They were asked to follow the regimen for the duration of 8 weeks. The communication was made with them through phone once in a week. The post test data was collected after completion of 8 weeks.

**Result:**

In this study the pre interventional values of VAS was 7.1 and post interventional VAS was 4.9. Activity based exercises proved to improve strength, endurance and flexibility which might have accounted for the resultant improvement in VAS scores obtained in the study. The pre interventional values of RMDQ was 61 % and the post interventional RMDQ was 53%. The scale primarily measured the disability index in physical activity experienced due to low back pain which showed a significant improvement which highly marks the importance of adding home based exercise in daily activities.

**Conclusion :**

From the study it concludes that there is statistically significant Effectiveness of Activity based exercise program to improve quality of life in farmers with chronic low back pain. Thus from the study the alternate hypothesis is proved and accepted.

[Kunjungi situs](#)

• Thank you for the review of WSPC-JMR-D-20-00060

Yahoo/Email M... ★

 • **J. of Musculoskeletal Research (JMR)** <em@editorialmanager.com>  
Kepada: Komang Agung

Kam, 3 Des jam 08.00 ★

Ref.: Ms. No. WSPC-JMR-D-20-00060  
EFFECTIVENESS OF ACTIVITY BASED EXERCISE PROGRAM ON QUALITY OF LIFE IN FARMERS WITH CHRONIC LOW BACK PAIN  
Journal of Musculoskeletal Research

Dear Professor Agung,

Thank You for your review of this manuscript.

You can access your review comments and the decision letter (when available) by logging onto the Editorial Manager site at:

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Kind regards,

Po-Quang Chen  
Managing Editor  
Journal of Musculoskeletal Research EFFECTIVENESS OF ACTIVITY BASED EXERCISE PROGRAM ON QUALITY OF LIFE IN FARMERS WITH CHRONIC LOW BACK PAIN.pdf  
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# Journal of Musculoskeletal Research

## EFFECTIVENESS OF ACTIVITY BASED EXERCISE PROGRAM ON QUALITY OF LIFE IN FARMERS WITH CHRONIC LOW BACK PAIN

--Manuscript Draft--

<b>Manuscript Number:</b>	WSPC-JMR-D-20-00060
<b>Full Title:</b>	EFFECTIVENESS OF ACTIVITY BASED EXERCISE PROGRAM ON QUALITY OF LIFE IN FARMERS WITH CHRONIC LOW BACK PAIN
<b>Article Type:</b>	Research Paper
<b>Keywords:</b>	Agriculture; musculoskeletal disorders; Exercise program; Ergonomics
<b>Manuscript Region of Origin:</b>	INDIA
<b>Abstract:</b>	<p>Purpose : Low back pain is the most common health problem among farmers because of wrong posture, heavy lifting and work load. And farmers are not aware of ergonomic considerations of their work tasks. The aim of the study was to educate them on how to meet their daily demands with proper ADL technique will enable them to perform tasks more efficiently, limit low back pain , and enhance recovery.</p> <p>Methods: 42 male farmers were selected as per the inclusion and exclusion criteria. Informed consent was taken after explaining them about the purpose of study. They were assessed for pre test data by using VAS and Roland – Morris disability Questionnaire. The activity based exercise program pamphlet was given to the participants. The instructions regarding the activities were thoroughly explained to them. They were asked to follow the regimen for the duration of 8 weeks. The communication was made with them through phone once in a week. The post test data was collected after completion of 8 weeks.</p> <p>Result: In this study the pre interventional values of VAS was 7.1 and post interventional VAS was 4.9. Activity based exercises proved to improve strength, endurance and flexibility which might have accounted for the resultant improvement in VAS scores obtained in the study. The pre interventional values of RMDQ was 61 % and the post interventional RMDQ was 53%. The scale primarily measured the disability index in physical activity experienced due to low back pain which showed a significant improvement which highly marks the importance of adding home based exercise in daily activities.</p> <p>Conclusion : From the study it concludes that there is statistically significant Effectiveness of Activity based exercise program to improve quality of life in farmers with chronic low back pain. Thus from the study the alternate hypothesis is proved and accepted.</p>

ORIGINAL ARTICLE

**EFFECTIVENESS OF ACTIVITY BASED EXERCISE PROGRAM ON QUALITY OF LIFE IN FARMERS WITH CHRONIC LOW BACK PAIN**

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## **ABSTRACT**

**Purpose :** Low back pain is the most common health problem among farmers because of wrong posture, heavy lifting and work load. And farmers are not aware of ergonomic considerations of their work tasks. The aim of the study was to educate them on how to meet their daily demands with proper ADL technique will enable them to perform tasks more efficiently, limit low back pain , and enhance recovery.

### **Methods:**

42 male farmers were selected as per the inclusion and exclusion criteria. Informed consent was taken after explaining them about the purpose of study. They were assessed for pre test data by using VAS and Roland – Morris disability Questionnaire.

The activity based exercise program pamphlet was given to the participants. The instructions regarding the activities were thoroughly explained to them. They were asked to follow the regimen for the duration of 8 weeks. The communication was made with them through phone once in a week. The post test data was collected after completion of 8 weeks.

### **Result:**

In this study the pre interventional values of VAS was 7.1 and post interventional VAS was 4.9. Activity based exercises proved to improve strength, endurance and flexibility which might have accounted for the resultant improvement in VAS scores obtained in the study. The pre interventional values of RMDQ was 61 % and the post interventional RMDQ was 53%. The scale primarily measured the disability index in physical activity experienced due to low back pain which showed a significant improvement which highly marks the importance of adding home based exercise in daily activities.

### **Conclusion :**

From the study it concludes that there is statistically significant Effectiveness of Activity based exercise program to improve quality of life in farmers with chronic low back pain. Thus from the study the alternate hypothesis is proved and accepted.

**Keywords:** Agriculture, Musculoskeletal disorders, Exercise program, Ergonomics.

## INTRODUCTION

Farming is a physically challenging occupation that cause musculoskeletal disorders.<sup>1</sup> The farmers and farm workers are at particular risk of developing musculoskeletal disorders because of the wrong physical activity during farm work.<sup>2</sup> In many countries, agriculture is recognized as one of the harmful industries.<sup>3</sup> Low back pain is the most common musculoskeletal disorder in farmers. Low back problems are common in farmers associated with the amount of posture require back flexion and carrying and lifting of heavy loads during working in farm. The prevalence of low back pain in farmers is around 50%. Postures particularly squatting and bent posture for a prolonged period of time or severe flexion or lateral twist and bending have been found to be significantly associated to low back pain.<sup>3</sup> The physical status of their occupation make farm workers potentially susceptible to musculoskeletal disorders (MSDs) like Osteoarthritis of the hip and knee, Low back pain(LBP), upper limb disorders and hand arm vibration syndrome also to the consequences of trauma.<sup>4</sup>

Low back pain :

Low back pain is a main reason of poor health and disability.<sup>5</sup> In the industrialized world more than 80% of the general population suffering from low back pain. It is the most common cause of disability affecting people under 45 years of age.<sup>6</sup> The pain is located in the lumbosacral region, buttocks and thighs. There is no radiation of pain to foot or toes.<sup>7</sup>

The stability to the vertebral columns and strength and endurance to the back is provided by the muscles such as erector spine, intercostalis dorsi. The erector spine consists of iliocostalis ,longissimus and spinalis.

The following ligaments provide stability to lumbosacral and sacroiliac complexes: anterior longitudinal ligament, posterior longitudinal ligament, supra spinous ligament.

The patients with low back pain have the symptoms such as Back pain, Leg pain, Neurologic symptoms and spinal deformity. Patient have one or more of these symptoms.<sup>7</sup>

Risk factors for low back pain: Almost all the humans will suffered from low back pain at some point. The other risk factors for low back pain are: Heavy manual labor, Repetitive lifting and twisting, Postural stress, Whole body vibration, Monotonous work, Poor physical fitness and smoking.<sup>7</sup>

Other causes for low back pain in farmers are: Protuberant abdomen, Occupational bad posture, Habitual bad posture<sup>8</sup>

Low back problems have an effect on the flexibility , stability and strength of the spine which can develop complaints of pain, uneasiness and stiffness.<sup>3</sup> Low back pain (LBP) is a common health problem arising from work with manual handling, especially in farmers. The literature confirms that the prevalence of LBP among farmers is high, mainly in developing contries.<sup>9</sup>

Physiotherapy management for low back pain :

Chronic low back pain is a multifactorial phenomenon and there are many therapeutic approaches exist. Some approaches are not much effective but Physiotherapy, cognitive behavioral therapy and multidisciplinary pain management programs have all been effective.

The use of ergonomics keeps workers safe, comfortable and dynamic which improves posture, reduced force and less repetition which prevents injuries. Due to the labor-intensive nature of farming, ergonomics can be a huge role in reducing the risk of low back pain.<sup>1</sup>

There are so many scales are available to measure the pain intensity of low back pain. Visual analogue scale is one of them. This is commonly used method to measure pain intensity. Pain intensity is a quantitative estimate of the severity or magnitude of perceived pain. Pain intensity is defined as how much a patient is hurt by his low back pain.<sup>10</sup>

Functional status is an important evaluative outcome measure in low back pain rehabilitation. To assess changes in functional status after treatment in patients with low back pain, the Roland Morris Disability Questionnaire (RMDQ) is frequently used. The RMDQ is derived from the sickness impact profile, a general health questionnaire.<sup>11</sup>

### **NEED FOR THE STUDY**

According to a survey conducted agriculture is one of the industry which pose heavy physical efforts. A number of national and international studies have shown that farming is a physically demanding occupation with work tasks that can cause musculoskeletal disorders Farming is a physically demanding occupation with work tasks that cause MSDs and work disability such as lifting heavy objects, moving and carrying equipments and awkward working postures. Many type of work cause pain and discomfort when farmers are not aware of ergonomic considerations of their work tasks. Educating them on how to meet their daily demands with proper ADL technique will enable them to perform tasks more efficiently, limit low back pain , and enhance recovery. It has been found in the earlier studies that ergonomic advices and physiotherapy interventions help reduce low back pain. But however owing to lack of awareness about it they have limited access to this service. . Also there is paucity of literature to show if home exercise protocol based on ergonomic advice and physiotherapy intervention will prove to be effective. So indeed this made us to study the effectiveness of activity based exercises for low back pain in farmer.

## METHODS

### **Methodology:**

**Type of study:** Experimental Study , **Study design-** pre test and post test, **Place of study-** Krishna institute of medical sciences deemed to be university , **Sample size-**42 , **Sampling method-** simple random method , **Duration of study-** 6 months

**Materials:** Paper, Pen, Data collection sheet, Pamphlet

**Inclusion criteria:** Farmers with chronic low back pain about 8 to 12 weeks, Only male subjects, Age group 30-50 years

**Exclusive criteria:** Patients with any red or yellow flag signs, Any recent trauma, Any abdominal surgery

**Outcome measures:** Visual Analogue Scale

Roland – Morris disability questionnaire

**Procedure:** This is a study of Effectiveness of Activity based exercise program to improve quality of life in farmers with chronic low back pain. The study will be conducted in Krishna Institute of Medical Sciences ‘ Deemed to be’ University Karad. Subjects will be selected according to the inclusion and exclusion criteria. Informed consent will be taken. The subject will undergo pre test using VAS and Roland – Morris disability Questionnaire.

The activity based exercise program will given to the patient for the duration of 8 weeks and after every week the subject will reassessed and follow up will be taken.

Treatment Protocol :

### **ERGONOMIC ADVICE**

1. The break may consist of frequent short breaks such as 5 minutes after every hour
2. Workers may carry crops on their back instead of head and explore the appropriate backpack.
3. Strain on the lower back and legs are reduced by sitting down while working. Standing causes legs to swell.
4. Squat with heels on the ground. Keep your back straight, feet apart about a foot and toes pointed outward.
5. When lifting, keep the loads between hand level and shoulder level. Avoid lifts from the floor or over shoulder level.



6. When carrying objects for long distance use pallet trucks, or utility carts. Use roller conveyors for bags.
7. Alternate low repetition tasks with tasks that require repetitive motion.
8. Bend the knees at a right angle. Keep knees even with or slightly higher than your hips. Avoid crossed legs
9. Try to avoid sitting in the same position for more than 30 minutes.

### **POSTURAL TRAINING**

Breathing exercises for posture and stability

Practice of Valsalva maneuver on improving stability.

Awareness and control of spinal posture

Stress management and relaxation

### **AEROBIC EXERCISE TRAINING**

Walking

### **PHYSICAL ACTIVITY**

It has been reported that physical activity is reduced in chronic low back pain patients and therefore emphasis should be kept on normalizing using ergonomic advice in activities of daily living.

### **TRAINING OF KYPHOTIC POSTURE**

Axial extension: To decrease forward head posture

Scapular retraction

Pelvic tilt and neutral spine

### **REDUCTION OF LUMBAR LORDOSIS**

Thoracic spine training

Total spinal movement and control

Reinforcement

### **SELF STRETCHING TECHNIQUE**

A self stretching technique for common mobility impairments

Training and strengthening techniques for common muscle impairments

Functional exercises for safe body mechanics

## **RESULT**

The study the pre interventional values of VAS was 7.1 and post interventional VAS was 4.9. Activity based exercises proved to improve strength, endurance and flexibility which might have accounted for the resultant improvement in VAS scores obtained in the study. The pre interventional values of RMDQ was 61 % and the post interventional RMDQ was 53%. The scale primarily measured the disability index in physical activity experienced due to low back pain which showed a significant improvement which highly marks the importance of adding home based exercise in daily activities as it helps to improve the activity performance level.

## DISCUSSION

In most countries, agriculture is recognised as most hazardous occupation. Low back pain is a common symptom, affecting more than 80% of the general population in the industrialized world. Patients with low back pain have one or more of four symptoms: Back pain, Leg pain, Neurologic symptoms and spinal deformity. The prevalence of low back pain in farmers has been reported to be around 50%. Low back problems affect the spine's flexibility, stability, and strength, which can cause pain, discomfort and stiffness. There are three main risk factors in agriculture: lifting and carrying heavy loads, sustained or repeated full body bending, and highly repetitive hand work. Stooped postures are strongly associated with high incidence of low back disorders (LBDs).

Postures especially severe flexion or lateral twist and bending have been found to be significantly related to low back pain.

This research was undertaken with the aim and to study on the effectiveness of Activity based exercise program on quality of life in farmers with chronic low back pain.

In activity based exercise program, the ergonomics and activity based exercises are included. Ergonomics is the science of designing the job, equipment and workplace to fit the worker while maintaining the efficiency of people in the workplace. The use of ergonomics keeps workers safe, comfortable and productive. Improving work posture, reduced force and less repetition prevents injuries. Due to the labor-intensive nature of farming, ergonomics can be a great value in reducing the risk of injuries.

In activity based exercises, there are three main goals: 1. Improving impaired back functions; 2. Decreasing back pain symptoms; 3. There was no need to spend separate time for exercises, it is done when participants do their farm work.

Stretching exercises were used to improve flexibility of trunk and restore normal trunk range of motion.

The study the pre interventional values of VAS was  $7.14 \pm 1.160$  and the post interventional VAS was  $4.95 \pm 1.413$  ( $t = 8.893, p < 0.0001$  extremely significant). Activity based exercises proved to improve strength, endurance and flexibility which might have accounted for the resultant improvement in VAS scores obtained in the study.

The pre interventional values of RMDQ was  $61.64 \pm 7.745$  and the post interventional RMDQ was  $53.35 \pm 7.404$  ( $t = 10.244, p < 0.0001$  considered extremely significant). The scale primarily measured the disability index in physical activity experienced due to low back pain which showed a significant improvement which highly marks the importance of adding home based exercise in daily activities as it helps to improve the activity performance level.

From the above statistical data of VAS and RMDQ, there was an extremely significant result showed with 95% of significance. Hence we reject the null hypothesis.

These findings showed that activity based exercise program was effective in producing functional and symptomatic improvement in chronic low back pain in farmers.

### **CONCLUSION**

From the study it concludes that there is statistically significant Effectiveness of Activity based exercise program to improve quality of life in farmers with chronic low back pain. Thus from the study the alternate hypothesis is proved and accepted.

## **ACKNOWLEDGEMENT**

We acknowledge the guidance and support from faculty of physiotherapy.

## REFERENCES

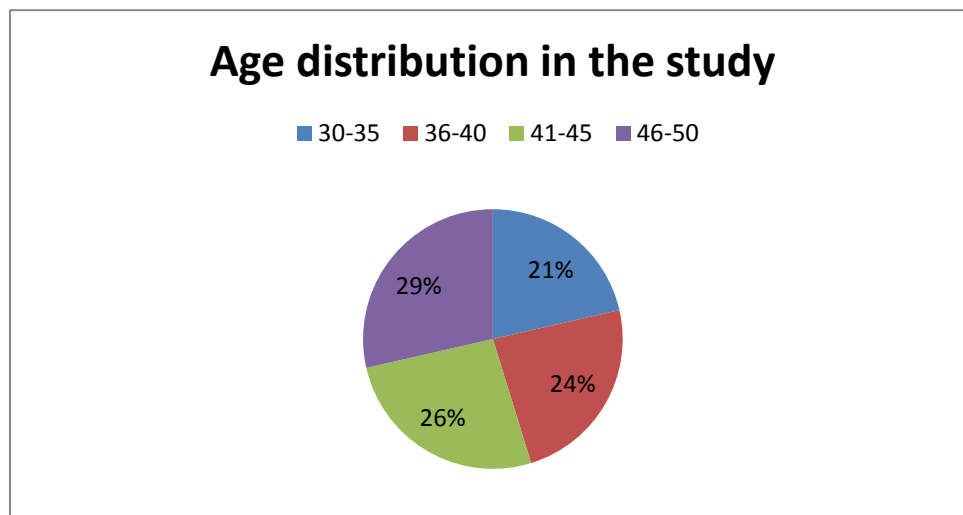
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## FINDINGS

### 1. Age Distribution in the study:

Age	No. of subjects
30 – 35	9
36 – 40	10
41 – 45	11
46 – 50	12

Table No.1: Age distribution in the study



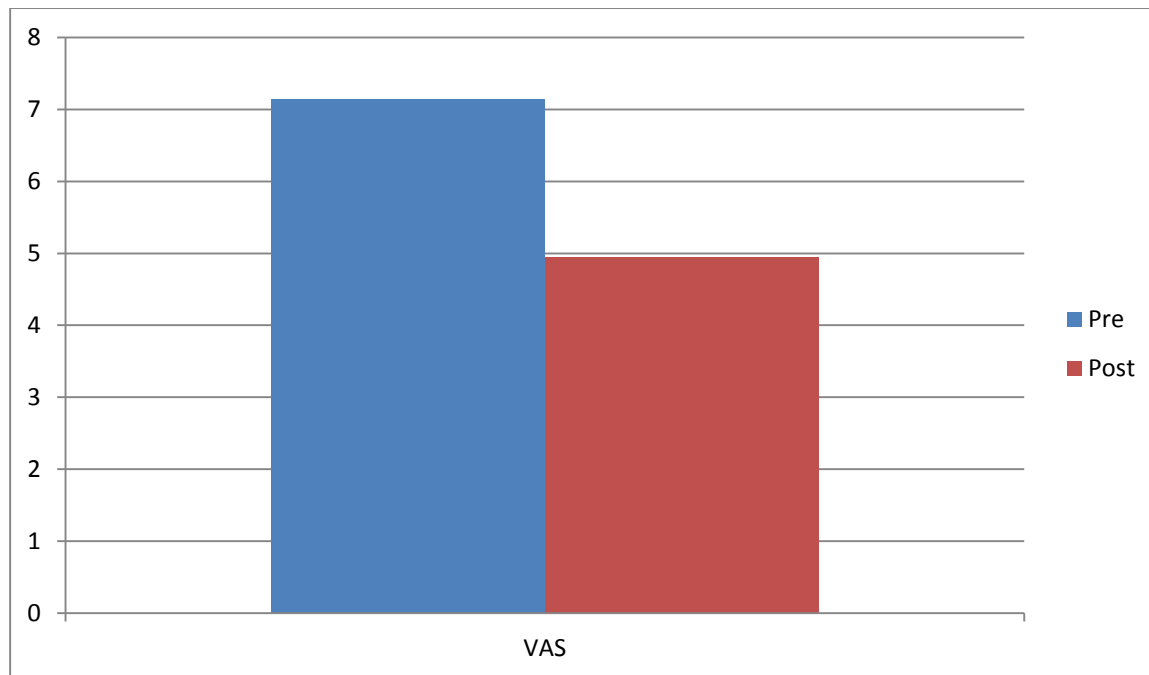
Graph No. 1 : Age distribution in the study

The study shows 21% participants are included in 30-35 age group, 24% in 36-40 age group, 26% in 41-45 age group and 29 % in 46-50 age group.

## 2. VAS :

	VAS	
	Pre interventional	Post interventional
<b>Mean±SD</b>	7.14±1.160	4.95±1.413
<b>N</b>	42	42
<b>DOF</b>	41	41
<b>T</b>	8.893	
<b>P</b>	<0.0001(extremely significant)	

Table No. 2: Pre and post interventional Visual analogue scale



Graph No. 2: VAS

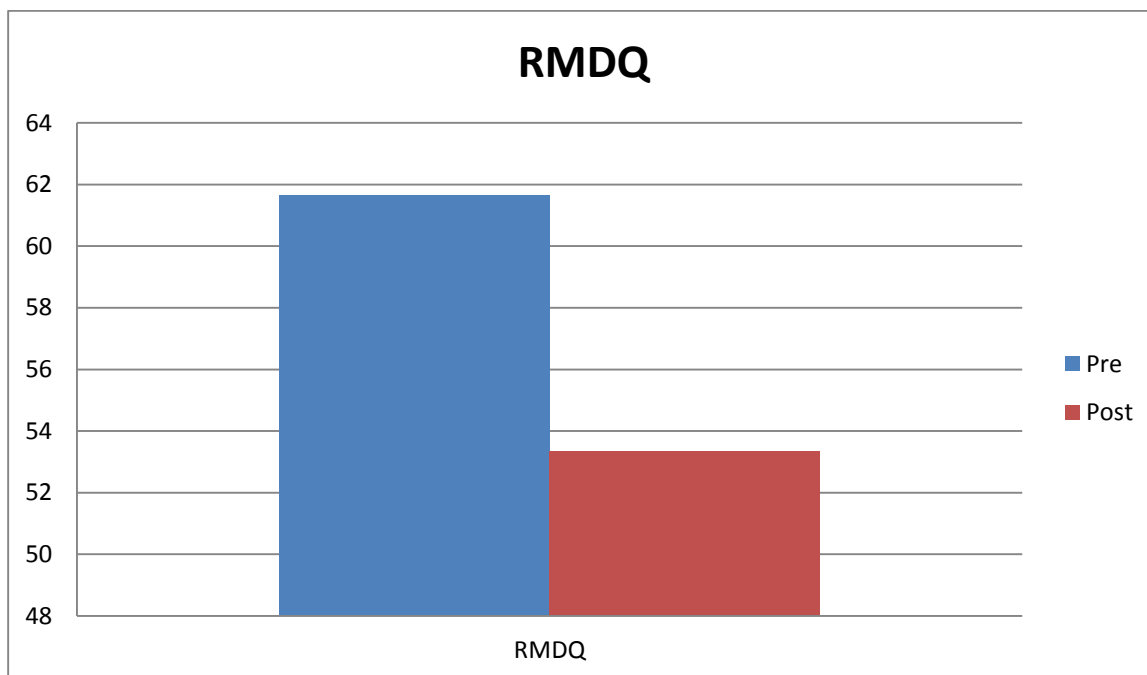
The pre interventional VAS was 7.14±1.160 and the post interventional VAS was 4.95±1.413. The p value was <0.0001 which is statistically extremely significant (t =8.893). This shows improvement in VAS. (Graph No. 2)



### 3. Roland Morris Disability Questionnaire :

	RMDQ	
	Pre interventional	Post interventional
<b>Mean±SD</b>	61.64±7.745	53.35±7.404
<b>N</b>	42	42
<b>DOF</b>	41	41
<b>T</b>	10.244	
<b>P</b>	<0.0001(extremely significant)	

Table No. 3: Pre and post interventional Roland Morris Disability Questionnaire



Graph No. 3: RMDQ

The pre interventional RMDQ was  $61.64 \pm 7.745$  and the post interventional RMDQ was  $53.35 \pm 7.404$ . The p value was  $<0.0001$  considered statistically extremely significant ( $t = 10.244$ ). This shows improvement in RMDQ. (Graph No. 3)

