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Positional Release Versus Myofascial Release Technique in Chronic Low Back Dysfunction

Mohamed EL Sayed Abdelkarem Ali[1], Wadida H. Abdelkader El Sayed[1], Rabab Ali Mohamed[1]. Hassan Huseen Ahmed[2]

[1]Physical Therapy Basic Science Department, Faculty of Physical Therapy, Cairo University, Giza, Egypt
[2]Orthopedic Surgery Faculty of Medicine BnhaUniversity , Giza, Egypt.

Abstract : Background: chronic low back dysfunction **(CLBD)** has direct and great influence on psychological, physical and socioeconomic aspects of the person's life. Myofascial release technique (**MFR**) is a form of soft tissue therapy used to treat somatic dysfunction and accompanying pain and restriction of motion. Positional release technique (**PRT**) is an indirect osteopathic treatment technique. **Purpose:** this study was conducted to investigate the effect of **PRT, MFR** and conventional physical therapy treatment on pain intensity level, spinal mobility and functional disabilities level in patients with **CLBD**. Also, to compare the effect among **PRT, MFR** and conventional physical therapy treatment on pain intensity level, spinal mobility and functional disabilities level in patients with **CLBD**. **Methods:** Forty two patients from both genders were diagnosed as **CLBD**, aged from 40 to 60 years. Assigned randomly into three groups, each group consisted of 14 patients. **Control group C** with mean age, weight, height and BMI of 51.21±6.98, 72.85±6.19, 171.57±5.95 and 24.86±3.030 respectively received conventional physical therapy program. **Group B** with mean age, weight, height and BMI of 49.35±7.36, 72.64±6.42, 171.57±5.95 and 24.78±3.064 received conventional physical therapy program and **PRT**. **Group A** with mean age, weight, height and BMI of 49.35±6.23, 72.28±6.99, 171.57±5.95, and 24.65±3.176 respectively received conventional physical therapy program and **MFR** technique.Sessions were conducted three days / week every other day for 12 sessions**.** Pain intensity level was measured by Visual Analogue Scale, Lumbar range of motion (**ROM**) was measured by the modified Schober technique and the finger tip-to-floor technique and finally functional disability level was measured by Oswestery Low Back Pain Disability Questionnaire. Measurements were conducted pre-treatment and post-treatment. **Results:** showedthat, there was a significant differences between pre and post treatment within each group A, B and C for pain intensity level, lumbar **ROM** and functional disability level ($p<0.05$).There was no statistical significant differences between A and B in pain intensity level, lumbar **ROM**, and functional disability level ($p<0.05$). There was statistical significant differences between A and C in pain intensity level, lumbar **ROM**, and functional disability level ($p<0.05$).There was statistical significant differences between B and C in pain intensity level and lumbar **ROM** but there was no statistical significant differences in functional disability level ($p<0.05$). **Conclusion:** There is no significant difference between **PRT** and **MFR** in reducing pain, increasing the range of motion and functional disability in patients with **CLBD**.

Introduction

Sixty to eighty percent of people suffer at least one episode of Low back pain (LBP) sometime in their lives. Whilst many recover regardless of the treatment they are given. A minority of patients seems resistant to treatment and develops chronic pain and disability.[1]

Low back dysfunction (LBD) refers to an alteration of spinal joint position, motion characteristics and/or related palpable paraspinal soft tissue changes with symptoms varying with physical activity. It includes any abnormality in the function of the back, describing pain from innervated structures of the back.[2]

Low back dysfunction is not a diagnosis. It is a symptom that tends to occur in association with wide variety of musculoskeletal disorders**3.**Up to 85% of LBD with no definite etiology was classified as non-specific LBD or idiopathic LBD because it does not relate to specific anatomical abnormality.[1]

Low back dysfunction lasting for more than three months is more difficult to treat and the outcome is less certain. Despite an increasing number of clinical and basic research studies in this field, the underlying mechanism and pathophysiology are still uncertain.[4]

In Egypt, gradually shifting from agriculture to an industrial era, LBD is one of the leading causes for seeking health care providers. It is one of the most common reasons of absenteeism from work, resulting in high costs in terms of expenditure on diagnosis and treatment and in days lost from work [5]

There are many factors causing LBD. These factors may come from excessive loads to normal spinal structures or from normal loads to a spine with abnormal structures. The loads transmitted to the spine can be influenced by posture, body mechanics, trunk strength as well as flexibility in addition to strength of the muscles of the pelvic girdle and lower extremities.[3]

It is common to find stiffness and reduced lumbar range of movement (ROM) in clinical presentations of LBD with a limited ability to perform flexion of the trunk.[6]

A number of systemic reviews have shown that manual therapy; the skilled application of manual forces to the joint structures, provides effective results in treatment of musculoskeletal pain [7]

Positional release technique (PRT) is an indirect osteopathic treatment technique (also known as strain counter-strain), whereby dysfunctional joints and their muscle are moved away from their restrictive barrier into position of ease in the treatment of both musculoskeletal [8] and visceral dysfunctions.[9]

The application of positional release technique for somatic dysfunction requires a practitioner to first palpate a tender point in the soft tissues. The patient's limb is then moved in such a way that the pain associated with pressure on the tender points is reduced by at least 70 percent to find position of ease.[10]

Reported that the minimum period which required holding a position of ease is 90 seconds, and suggested that the shortening or "folding-over" of aberrant tissue in positional release achieves its therapeutic modifications via both proprioceptive and nociceptive mechanisms[11]**.**

Myofascial release (MFR) is a therapeutic treatment that uses gentle pressure and stretching to facilitate the release of fascial restrictions caused by accidents, injury, stress, repetitive use, and traumatic or surgical scarring [12]**.**

Myofascial release is a form of soft tissue therapy used to treat somatic dysfunction and accompanying pain and restriction of motion. This is accomplished by relaxing contracted muscles, increasing circulation, increasing venous and lymphatic drainage.[13]

Until recently, it was believed that low back dysfunction was not a problem in "underdeveloped countries," but recent evidence clearly shows that its incidence in such countries is similar to that in the "developed" world and that when back pain clinics are made available, local people flock to them for treatment. It is a universal problem. Moreover, it is often impossible to be accurate about the source of the pain, as most demonstrable pathology is also visible in the symptom-free population.[14]

The variety of patient populations addressed in this special issue highlights the diversity of conditions for which manual physical therapy should play a role in evidence-based patient management. Like many aspects of practice, however, there appear to be barriers hindering the integration of the evidence supporting manual therapy into the decision-making processes of practicing clinicians[15]. These barriers need to be identified and dismantled. Recent research has questioned the validity of many theories underlying manual therapy. Yet evidence for the effectiveness of manual therapy is also prevalent. [16]

So, the purpose of this study was to investigate the effect of MFR, PRT and conventional physical therapy treatment on pain intensity level, spinal mobility and functional disabilities level in patients with chronic low back dysfunction (CLBD). Also, to compare the difference between effect of MFR, PRT and conventional physical therapy treatment on pain intensity level, spinal mobility and functional disabilities level in patients with CLBD

Materials and Methods

Design of Study

Pretest-posttest control group design was conducted. Forty two patients of both genders with CLBD were randomly assigned into three groups with fourteen subjects in each one.

Subjects

Forty two patients (30 males and 12 females) diagnosed as CLBD participated in this study. They were recruited from Helwan hospital outpatient clinic. Their age ranged from 40 to 60 years. Each patient signed written approached consent form **(Appendix I).** They were assigned randomly into three groups:

Group C (Conventional Physical Therapy)

Fourteen patients received conventional physical therapy treatment [18,19]. Sessions were conducted three days / week every other day for 12 sessions.

Group B (PRT)

Fourteen patients received PRT and conventional physical therapy treatment [18,19]. Sessions were conducted three days / week every other day for 12 sessions

Group A (MFR)

Fourteen patients received MFR and conventional physical therapy treatment [18,19,20]**.** Sessions were conducted three days / week every other day for 12 sessions

Selection of Subject

Inclusion Criteria

Patients from both gender participated in this study:

1. Patients were diagnosed as CLBD based on referral from orthopedic surgeon who was responsible for the diagnosis of cases based on clinical and radiographic examinations.
2. Patient's age ranged from 40 to 60 years old.
3. Body mass index ranged from 25 -29.9 (kg/m^2)
4. Patients with CLBD for more than three months[21]**.**
5. Patients with moderate disability (20-40%) determined by Oswestery Low Back Pain Disability Questionnaire[22]**.**

Exclusion Criteria

1. Patients with any previous back surgery.
2. Neurologic symptoms.

3. Patients with spondylolisthesis or hip arthrosis.
4. Symptoms of vertigo or dizziness.
5. Patients with congenital musculoskeletal disorders.
6. Cardiopulmonary disease with decreased activity tolerance.

Instrumentation and Tool

A. Measurement Instrumentation

1. Visual analogue scale (VAS).

It was used for measurement of pain intensity level pre and post treatment in patients with CLBD, **Appendix II**. To evaluate the pain intensity the subjects were asked to mark where the pain would be classified on the scale where 0 represents the least possible pain level and 10 represents the maximum possible pain intensity. This scale was represented as a 10-cm line. The value of pain level was then estimated as the measured in distance between 0 and the respondent's mark**,** 73,119**.**VAS can give a valid and reliable data for chronic pain**.** In a study to compare the responsiveness of the McGill pain questionnaire with the VAS, although the McGill pain questionnaire is sufficiently sensitive to detect the differences among different methods to relieve pain, the authors found that the VAS or the numerical rating scale are quicker, simpler to administrator, easier to translate into other languages and the VAS is more responsive to clinical changes than the McGill pain questionnaire [23]**.**

2. The oswestery low back pain disability questionnaire

It was used to measure patient's functional disabilities level 85, **appendix III**. It consists of ten questions including the daily functional disability, each question includes six choices, and the patient would select the best one which describes his disability. The maximum score is 50 divides as follow, each question take 5, the first statement takes 0, and the sixth statement takes 5. The maximum score in this study was 45, because the sex life item would be omitted [19]**.** It is valid and reliable tool. It consists of ten multiple choice questions for back pain, patient selected one sentence out of six that best describe his pain, Higher scores indicated great pain. Many measures had been used to assess the functional disability of CLBD patients, but it was found that Oswestry Low Back Pain Disability Questionnaire is confined to the disability, according to the world health organization definition of disability. It was reported that high scores indicate greater disability[22]**.**

translated the Oswestery Low Back Pain Disability Questionnaire into Arabic and validated it for assessing low back pain in Arab population. They found the Arabic version of Oswestery Low Back Pain Disability Questionnaire is more reliable and valid for Arab population[24], **Appendix IV.**

3. The modified schober technique.

It was used to measure the lumbar flexion and extension and the finger tip-to-floor technique was used to measure the lateral trunk flexion**.** It is a valid and reliable method for measuring the ROM in patients with CLBD **25.**

4. The finger tip-to-floor technique

The finger tip-to-floor technique was used to measure the lateral trunk flexion.It is a valid and reliable method for measuring the ROM in patients with CLBD [25]**.**

5. The height, weight and body mass index

The height and weight measured and body mass index (BMI) calculated by dividing a person’s weight in kilograms by the square of their height in meters [26]**.**

B. Treatment Instrumentation

InfraredRadiation

It was used as a form of heat. Its model was 2004/2N. The device has a power of 400w, voltage of 203v

and frequency of 50/60Hz [27]

Procedures

Initially, the purpose of this study and procedures of measurement and treatment were explained by researcher to each patient. Each patient signed written approached consent form **(Appendix I).** Weight (Kg) and height (Cm) were recorded for each subject before starting treatment.

Results

Statistical analysis was conducted using SPSS for windows, version 18 **(SPSS, Inc., Chicago, IL).** The current test involved two independent variables. The first one was the (tested group); between subjects factor which had three levels (group A received MFR and conventional physical therapy treatment, group B received PRT and conventional physical therapy treatment and group C received conventional physical therapy treatment). The second one was the (training periods); within subject factor which had two levels (pre, post). In addition, this test involved six tested dependent variables (ROM of lumbar flexion, extension, right side bending, left side bending, pain, and oswestry scale). Accordingly, 3×2 mixed design MANOVA was used to compare the tested variables of interest at different tested groups and measuring periods. With the initial alpha level set at 0.05.

Prior to final analysis, data were screened for normality assumption, homogeneity of variance, and presence of extreme scores. This exploration was done as a pre-requisite for parametric calculations of the analysis of difference.

Descriptive analysis using histograms with the normal distribution curve showed that the data were normally distributed and not violates the parametric assumption for each of the measured dependent variables. Additionally, testing for the homogeneity of covariance revealed that there was no significant difference with p values of > 0.05. The box and whiskers plots of each of the tested variables after removal of the outliers were done. All these findings allowed the researchers to conduct parametric analysis.

3×2 mixed design MANOVA

Statistical analysis using 3x2 mixed design MANOVA indicated that there were significant effects of the tested group (the first independent variable) on the all tested dependent variables; ROM of lumbar flexion, extension, right side bending, left side bending, pain, and oswestry scale (F=3.031, P=0.003*). In addition, there were significant effects of the measuring periods (the second independent variable) on the tested dependent variables(F=144.747, P=0.0001*). Also, the interaction between the two independent variables was significant, which indicates that the effect of the tested group (first independent variable) on the dependent variables was influenced by the measuring periods (second independent variable) (F=12.64, P=0.0001*) as shown in **table(1)**.

Table (1): The 3x2 mixed design Multivariate Analysis of Variance (MANOVA) for all dependent variables at different measuring periods between both groups.

Source of Variation	F-value	P-value
Groups	3.031	0.003*
Measuring periods	144.747	0.0001*
Interaction	12.64	0.0001*

***Significant at alpha level <0.05**.

Demographic Data

Forty tow patients aged between 40-60 years participated in the study. They were random assigned into three groups, each group consist of 12 patients with values of age, weight, height and BMI as follow

Age

From table (2) and figure (1), the mean values of age were (49.35±6.23, 49.35±7.36 and 51.21±6.98) for group A, group B and group C respectively.

Weight

From table (2) and figure (2), the mean values of weight were (72.28±6.99, 72.64±6.42, 72.85±6.19) for group A, group B and group C respectively.

Height

From table (2) and figure (3), the mean values of age were (171.57±5.95, 171.57±5.95, 171.57±5.95) for group A, group B and group C respectively.

BMI

From table (2) and figure (4), the mean values of BMI were (24.65±3.176, 24.78 ± 3.064,24.86±3.030) for group A, group B and group C respectively.

As indicated by the One WayAnalysis of Variance (ANOVA), there were no significant differences ($p>0.05$) in the mean values of age, weight, height and BMI among the tested groups (Table 1).

Table (2). Demographic data of subjects for group (A),group (B)and group (C) .

Variables	Group A (Mean ±SD)	Group B (Mean ±SD)	Group C (Mean ±SD)	F-value	P-value	Level of significant
Age (years)	**49.35±6.23**	**49.35±7.36**	**51.21±6.98**	**0.340**	**0.714**	**NS**
Weight (kg)	**72.28±6.99**	**72.64±6.42**	**72.85±6.19**	**0.027**	**0.973**	**NS**
Height (cm)	**171.57±5.95**	**171.57±5.95**	**171.57±5.95**	**0.000**	**1.00**	**NS**
BMI(kg/m2	**24.65±3.176**	**24.78±3.064**	**24.86±3.030**	**0.022**	**0.614**	**NS**

*Significant at alpha level <0.05, SD: standard deviation, S: significance, NS: non-significant, kg: kilograms, BMI: body mass index, kg/m²: kilogram on meter square, CM: centimeter, P: alpha level

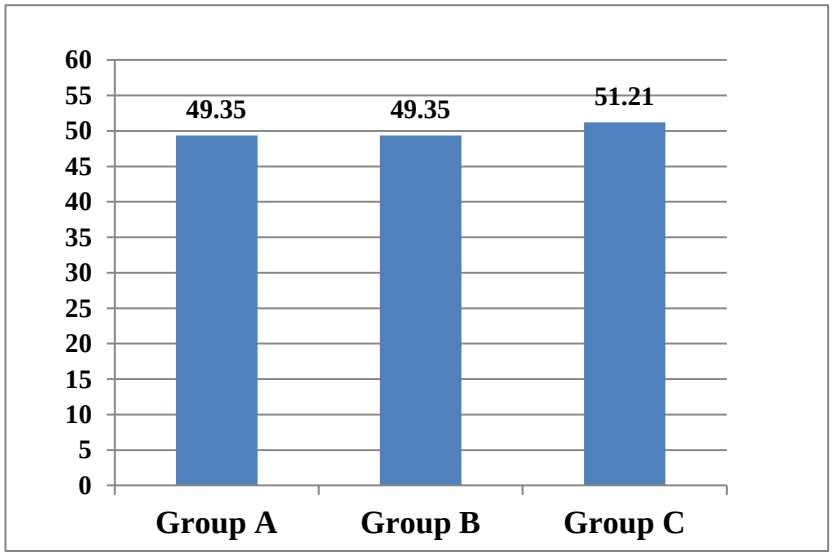

Figure (1): Mean values of age for A, B and C.

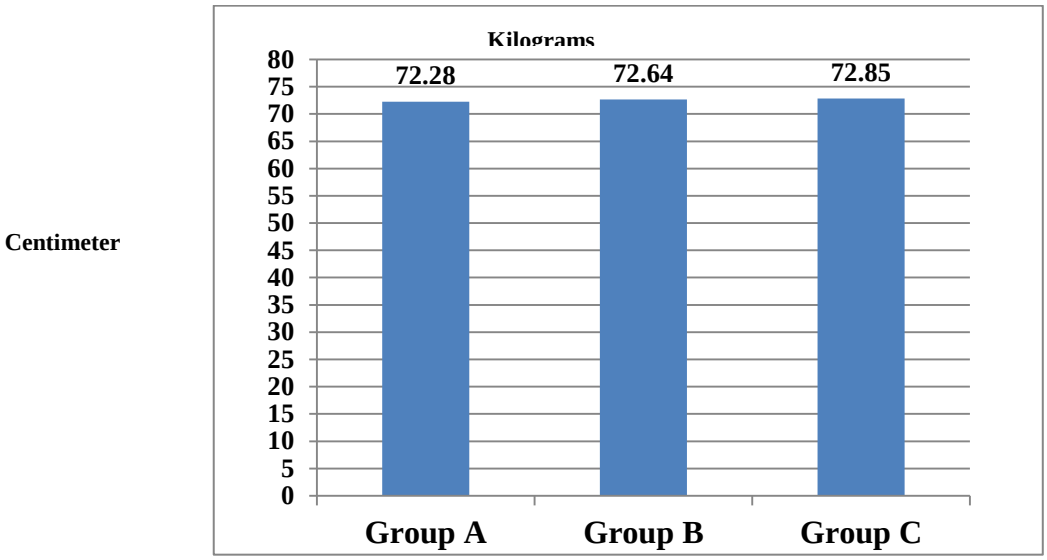

Figure (2): Mean values of weight for A, B and C.

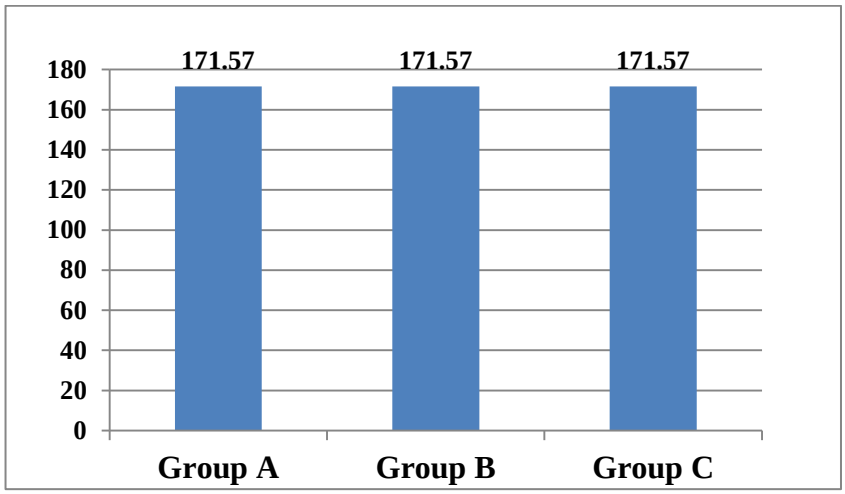

Figure (3): Mean values of height for A, B and C.

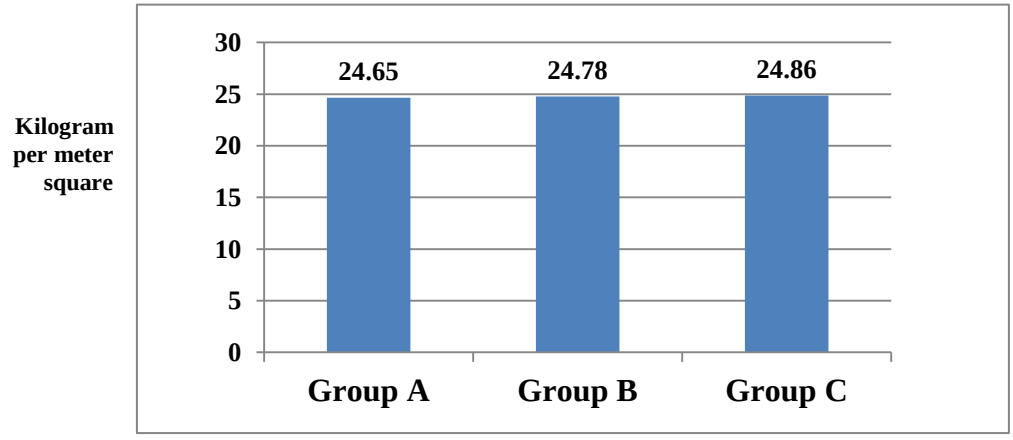

Figure (4): Mean values of BMI for A, B and C.

A. Range of Motion for Lumbar Flexion Pre and Post Treatment

1-Within Group

As presented in **table (3)** and illustrated in **figure (5),** the mean value of ROM of lumber flexion for group A at the entry of study (pre) was 7.92 ±1.54 and increases to 9.92±1.54 after 12 session of intervention. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar flexion at post treatment compared to pre-treatment (P-value =0.0001*).Also, the mean value for group B at the entry of study was 8.35 ±2.06 and increases to9.78 ±1.71after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar flexion at post treatment in comparing to pre-treatment (P-value =0.0001*).Moreover, the mean value for group C at the entry of study was6.92±1.54 and increases to 7.71 ±1.38 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar flexion at post-treatment in compared to pre-treatment (P-value =0.0001*).

Table (3).Range of motion for lumbar flexion pre and post treatment in group (A), (B) and (C).

ROM of lumbar flexion	Group A (Mean ±SD)	Group B (Mean ±SD)	Group C (Mean ±SD)
Pre	7.92 ±1.54	8.35 ±2.06	6.92±1.54
Post	9.92 ±1.54	9.78 ±1.71	7.71 ±1.38
% of change	8.72% ↑	6.12% ↑	3.60% ↑

SD: standard deviation., ↑ : increase., %: percentage .,

2- Among Groups

As presented in **table (4) and (5)** and illustrated in **figure (5),** Multiple pairwise comparison tests (Post hoc tests) revealed that the mean values of ROM of lumber flexion "pre" treatment among (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=1.00, P=0.404, and P=0.106) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was no significant difference of the mean values of ROM of lumber flexion "post" treatment between (group A versus B) with (p=1.00). while, there was significant difference among (group A versus C), and (group B versus C) with (P=0.002* and P=0.003*) respectively and this significant increase in favor of group B and group A than group C. Additionally, there was no statistical significant difference between group A and group B while there was clinical difference in favor to group B.

Table (4).Multiple pairwise comparisons between pre and post treatment values for ROM of lumbar flexion at group A, B and C.

Pre Vs. post	Group A	Group B	Group C
F-value	415.165	415.165	415.165
p-value	0.0001*	0.0001*	0.0001*

***Significant at alpha level <0.05., Vs.: versus.**

Table (5).Multiple pairwise comparison tests (Post hoc tests) for the ROM of lumbar flexion at group A, B and C at pre and post treatment periods

	Group A Vs. group B	Group A Vs. group C	Group B Vs. group C
Pre	1.00	0.404	0.106
Post	1.00	0.002*	0.003*

***Significant at alpha level <0.05., Vs.: versus.**

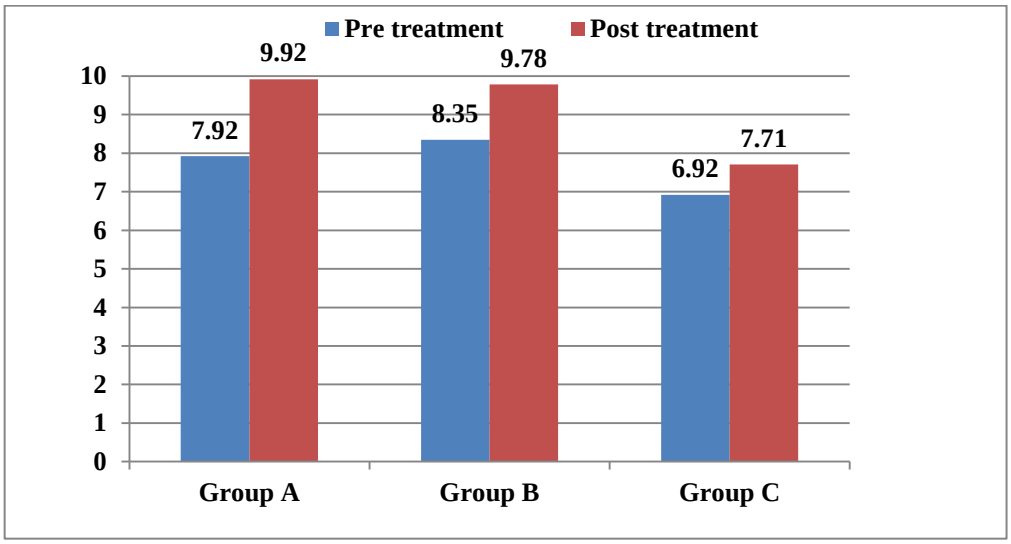

Figure (5): Mean values of ROM of lumbar flexion pre and post-treatment for groupA, B and C.

B. Range of Motion for Lumbar Extension Pre and Post Treatment

1-Within Group

As presented in **table (6)** andillustrated in **figure (6),** the mean value of ROM of lumber extension for group A at the entry of study (pre) was 3.28 ±0.99 and increases to 5.28 ±0.99 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar extension at post treatment in comparing to pre-treatment (P-value =0.0001*). Also, the mean value for group B at the entry of study was 4.85 ±1.35 and increases to5.42 ±1.0112 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar extension at post treatment in compare to pre-treatment (P-value =0.0001*).Moreover, the mean value for group C at the entry of study was3.07±0.86 and increases to 3.85 ±0.91 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar extension at post-treatment in compared to pre-treatment (P-value =0.0001*).

Table (6).Range of motion for lumbar extension pre and post treatment in group A, B and C.

ROM of lumbar extension	Group A (Mean ±SD)	Group B (Mean ±SD)	Group C (Mean ±SD)
Pre	3.28 ±0.99	4.85 ±1.35	3.07±0.86
Post	5.28 ±0.99	5.42 ±1.01	3.85 ±0.91
% of change	16.28% ↑	12.06% ↑	6.07% ↑

SD: standard deviation., ↑: increase., %: percentage .

2- Among Groups

As presented in **table (7) and (8)** andillustrated in **figure (6),** Multiple pairwise comparison tests (Post hoc tests) revealed that the mean values ROM of lumber extension "pre" treatment among (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=0.913, P=0.519, and P=0.06) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was no significant difference of the mean values ROM of lumber extension of "post" treatment between (group A versus B) with (p=1.00). While, there was significant difference among (group A versus C), and (group B versus C) with (P=0.001* and P=0.001*) respectively and this significant reduction in favor of group B and group A than

group C. Additionally, there was no statistical significant difference between group A and group B while there was clinical difference in favor to group A.

Table (7).Multiple pairwise comparisons between pre and post treatment values for ROM of lumbar extension at group A, B and C.

Pre Vs. post	Group A	Group B	Group C
F-value	415.165	415.165	415.165
p-value	0.0001*	0.0001*	0.0001*

***Significant at alpha level <0.05., Vs.: versus.**

Table (8).Multiple pairwise comparison tests (Post hoc tests) for the ROM of lumbar extension at group A, B and C at pre and post treatment periods

	Group A Vs. group B	Group A Vs. group C	Group B Vs. group C
Pre	0.913	0.519	0.06
Post	1.00	0.0001*	0.0001*

***Significant at alpha level <0.05., Vs.: versus.**

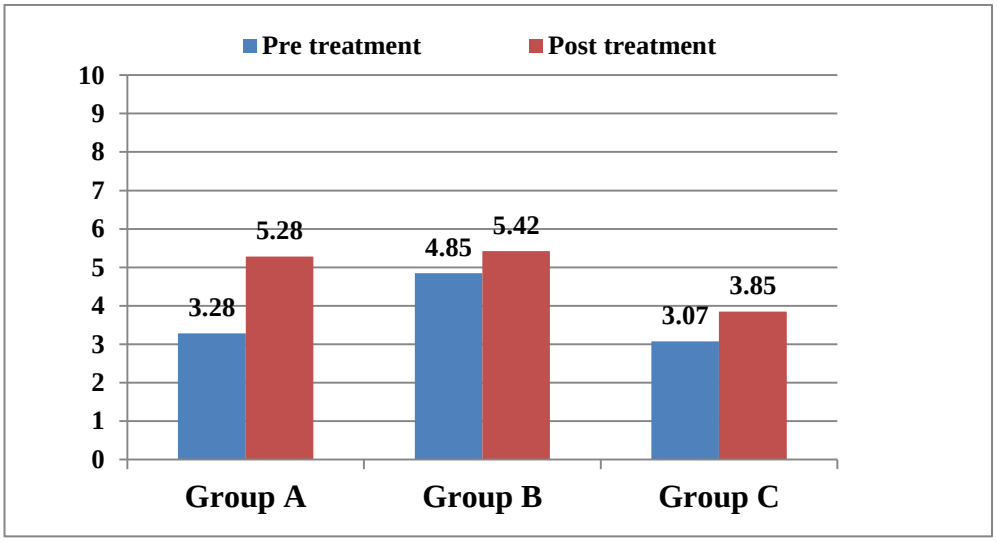

Figure (6): Mean values of ROM of lumbar extension pre and post-treatment for group A, B and C.

C. Range of Motion for Lumbar of Right Side Bending Pre and Post Treatment

1-Within Group

As presented in **table (9)** and illustrated in **figure (7),** the mean value of lumbar of right side bending for group A at the entry of study (pre) was 48.78±1.36 and decreases to 46.64 ±1.54after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar right side bending at post treatment in comparing to pre-treatment (P-value =0.0001*). Also, the mean value for group B at the entry of study was 47.92 ±1.38 and decreases to46.5 ±1.16 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar right side bending at post treatment in compare to pre-treatment (P-value =0.0001*).Moreover, the mean value for group C at the entry of study was48.92±0.82 and decreases to 48.07 ±0.82 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar right side bending at post-treatment in compared to pre-treatment (P-value =0.0001*).

Table (9).Range of motion for lumbar right side bending pre and post treatment in group A, B and C.

ROM of right side bending	Group A (Mean ±SD)	Group B (Mean ±SD)	Group C (Mean ±SD)
Pre	48.78±1.36	47.92 ±1.38	48.92±0.82
Post	46.64 ±1.54	46.5 ±1.16	48.07 ±0.82
% of change	4.38% ↓	2.96% ↓	1.73% ↓

SD: standard deviation., : decrease., %: percentage .

2- Among Groups

As presented in **table (10) and (11)** and illustrated in **figure (7),** Multiple pairwise comparison tests (Post hoc tests) revealed that the mean values of ROM of lumbar right side bending "pre" treatment among (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=0.213, P=1.00, and P=0.11) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was no significant difference of the mean values of ROM of lumbar right side bending "post" treatment between (group A versus B) with (p=1.00). while, there was significant difference among (group A versus C), and (group B versus C) with (P=0.01* and P=0.004*) respectively and this significant reduction in favor of group B and group A than group C. Additionally, there was no statistical significant difference between group A and group B while there was clinical difference in favor to group B.

Table (10).Multiple pairwise comparisons between pre and post treatment values for ROM of right side bending at group A, B and C.

Pre Vs. post	Group A	Group B	Group C
F-value	520.542	520.542	520.542
p-value	0.0001*	0.0001*	0.0001*

***Significant at alpha level <0.05., Vs.: versus.**

Table (11).Multiple pairwise comparison tests (Post hoc tests) for the ROM of right side bending at group A, B and C at pre and post treatment periods

	Group A Vs. group B	Group A Vs. group C	Group B Vs. group C
Pre	0.213	1.00	0.11
Post	1.00	0.01*	0.004*

***Significant at alpha level <0.05., Vs.: versus.**

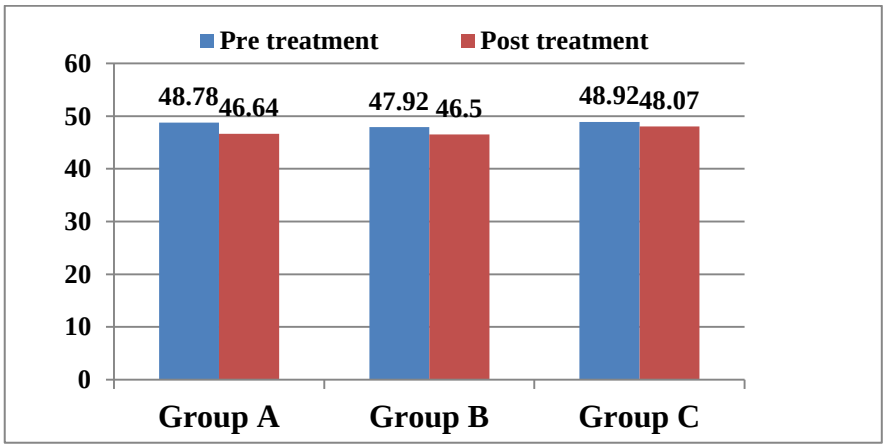

Figure (7): Mean values of ROM of right side bending pre and post-treatment for group A, B and C.

D. Range of Motion for Lumbar Left Side Bending Pre and Post Treatment

1-Within group

As presented in **table (12)** and illustrated in **figure (8**), the mean value of ROM of lumber left side bending for group A at the entry of study (pre) was 48.78±1.36 and decreases to 46.64 ±1.54 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar left side bending at post treatment in comparing to pre-treatment (P-value =0.0001*). Also, the mean value for group B at the entry of study was 47.92 ±1.38 and decreases to46.5 ±1.16 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar left side bending at post treatment in compare to pre-treatment (P-value =0.0001*).Moreover, the mean value for group C at the entry of study was48.92±0.82 and decreases to 48.07 ±0.82 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of lumbar left side bending at post-treatment in compared to pre-treatment (P-value =0.0001*).

Table (12).Range of motion for lumbar left side bendingpre and post treatment in group A, B and C.

ROM of left side bending	Group A (Mean ±SD)	Group B (Mean ±SD)	Group C (Mean ±SD)
Pre	48.78±1.36	47.92 ±1.38	48.92±0.82
Post	46.64 ±1.54	46.5 ±1.16	48.07 ±0.82
% of change	4.38% ↓	2.96% ↓	1.73% ↓

SD: standard deviation., : decrease., **%: percentage .**

2- Among groups

As presented in **table (13) and (14)** and illustrated in **figure (8),** Multiple pairwise comparison tests (Post hoc tests) revealed that the mean values of ROM of lumbar left side bending "pre" treatment among (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=0.213, P=1.00, and P=0.11) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was no significant difference of the mean values of ROM of lumbar left side bending "post" treatment between (group A versus B) with (p=1.00).while, there was significant difference among (group A versus C) and (group B versus C) with (P=0.01* and P=0.004*) respectively and this significant reduction in favor of group B and group A than group C. Additionally, there was no statistical significant difference between group A and group B while there was clinical difference in favor to group B.

Table (13).Multiple pairwise comparisons between pre and post treatment values for ROM of left side bending at group A, B and C.

Pre Vs. post	Group A	Group B	Group C
F-value	520.542	520.542	520.542
p-value	0.0001*	0.0001*	0.0001*

***Significant at alpha level <0.05., Vs.: versus.**

Table (14).Multiple pairwise comparison tests (Post hoc tests) for the ROM of left side bending at group A, B and C at pre and post treatment periods

	Group A Vs. group B	Group A Vs. group C	Group B Vs. group C
Pre	0.213	1.00	0.11
Post	1.00	0.01*	0.004*

***Significant at alpha level <0.05., Vs.: versus.**

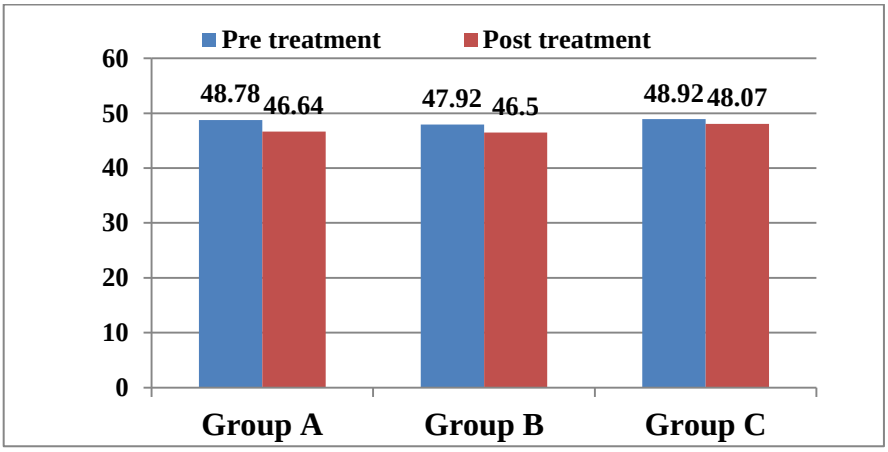

Figure (8): Mean values of ROM of left side bending pre and post-treatment for group A, B and C.

I. Pain Intensity Level

1-Within Group

As presented in **table (15)** and illustrated in **figure (9),** the mean value of pain level for group A at the entry of study (pre) was 7.92 ±0.82 and decreased to 5.92 ±0.82 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant decreased of pain level at post treatment in comparing to pre-treatment (P-value =0.0001*). Also, the mean value for group B at the entry of study was 7.14 ±1.09 and decreased to5.35 ±0.84 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant decrease of pain level at post treatment in comparing to pre-treatment (P-value =0.0001*).Moreover, the mean value for group C at the entry of study was7.92±0.82 and decreased to 7.14 ±0.86 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant decreased of pain level at post-treatment in compared to pre-treatment (P-value =0.0001*).

Table (15). Pain level pre and post treatment in group A, B and C.

Pain	Group A (Mean ±SD)	Group B (Mean ±SD)	Group C(Mean ±SD)
Pre	7.92 ±0.82	7.14 ±1.09	7.92±0.82
Post	5.92 ±0.82	5.35 ±0.84	7.14 ±0.86
% of change	25.25% ↓	25.07% ↓	9.84% ↓

SD: standard deviation., ↓: decrease., %: percentage

2- Among Groups

As presented in **table (16) and (17)** and illustrated in **figure (9),** Multiple pairwise comparison tests (Post hoc tests) revealed that the mean values of Pain level "pre" treatment between (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=0.092, P=1.000, and P=0.092) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was no significant difference of the mean values of Pain level "post" treatment between (group A versus B) with (p=0.244).while, there was significant difference among (group A versus C), and (group B versus C) with (P=0.001* and P=0.0001*) respectively and this significant reduction in favor of group B and group A than group C. Additionally, there was no statistical significant difference between group A and group B while there was clinical difference in favor to group B.

Table (16).Multiple pairwise comparisons between pre and post treatment values for pain level at group A, B and C.

Pre Vs. post	**Group A**	**Group B**	**Group C**
F-value	153.896	153.896	153.896
p-value	0.0001*	0.0001*	0.001*

***Significant at alpha level <0.05., Vs.: versus.**

Table (17).Multiple pairwise comparison tests (Post hoc tests) for the pain at group A, B and C at pre and post treatment periods

	Group A Vs. group B	**Group A Vs. group C**	**Group B Vs. group C**
Pre	0.092	1.00	0.092
Post	0.244	0.001*	0.0001*

***Significant at alpha level <0.05., Vs.: versus.**

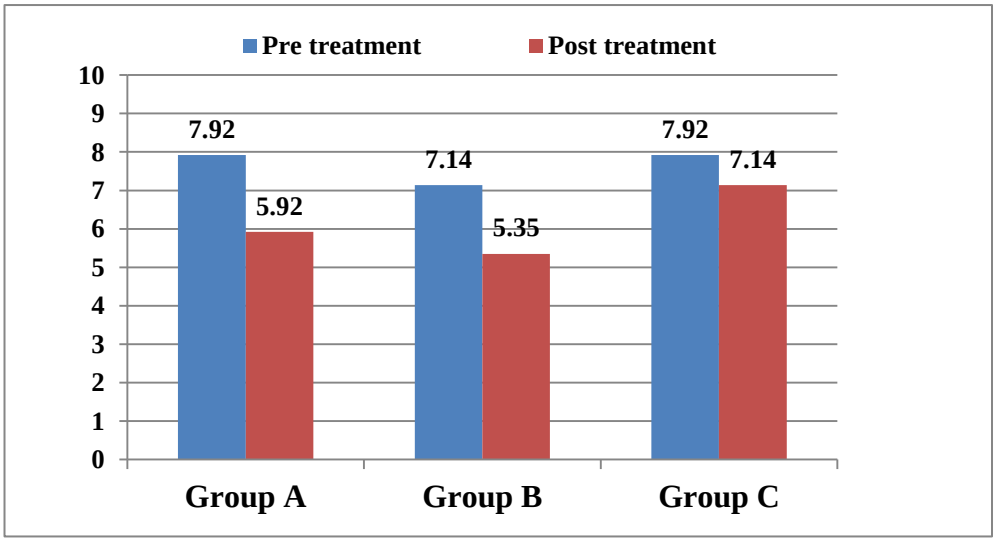

Figure (9): Mean values of pain pre and post-treatment for group A, B and C.

Disability Scale Score

1-Within Group

As presented in **table (18)** and illustratedin **figure (10),** the mean value of disability scale score for group A at the entry of study (pre) was 33.07 ±5.66 and decreases to 23.71 ±4.68after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of disability scale score at

post treatment in comparing to pre-treatment (P-value =0.0001*). Also, the mean value for group B at the entry of study was 35.85 ±2.87 and decreases to24.42 ±6.52 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of disability scale score at post treatment in comparing to pre-treatment (P-value =0.0001*).Moreover, the mean value for group C at the entry of study was33±3.11 and decreases to 29.07 ±3.09 after 12 sessions. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant decrease of disability scale score at post-treatment in compared to pre-treatment (P-value =0.0001*).

Table (18) Disability Scale Score pre and post treatment in group A, B and C.

disability scale score	**Group A (Mean ±SD)**	**Group B (Mean ±SD)**	**Group C (Mean ±SD)**
Pre	33.07±5.66	35.85 ±2.87	33±3.11
Post	23.71 ±4.68	24.42 ±6.52	29.07 ±3.09
% of change	28.3% ↓↓	31.88% ↓	11.9% ↓

SD: standard deviation., ↓ decrease., %: percentage .

2- Among Groups

As presented in **table (19) and (20)** and illustrated in **figure (10),** Multiple pairwise comparison tests (Post hoc tests) revealed that the mean values of disability scale score "pre" treatment (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=0.237, P=1.00, and P=0.215) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was no significant difference of the mean values of disability scale score "post" treatment between (group A versus B) and (group B versus C) with (p=1.00 and P=0.054) respectively. Additionally, there was no statistical significant difference between group A and group B while there was clinical difference in favor to group A.Also, there was no statistical significant difference between group B and group C while there was clinical difference in favor to group B. While, there was significant difference between (group A versus C) with (P=0.021*) and this significant reduction in favor of group A than group C.

Table (19).Multiple pairwise comparisons between pre and post treatment values for disability scale score at group A, B and C.

Pre Vs. post	**Group A**	**Group B**	**Group C**
F-value	180.588	180.588	180.588
p-value	0.0001*	0.0001*	0.001*

***Significant at alpha level <0.05., Vs.: versus.**

Table (20).Multiple pairwise comparison tests (Post hoc tests) for disability scale score at group A, B and C at pre and post treatment periods

	Group A Vs. group B	**Group A Vs. group C**	**Group B Vs. group C**
Pre	0.237	1.00	0.215
Post	1.00	0.021*	0.054

***Significant at alpha level <0.05., Vs.: versus.**

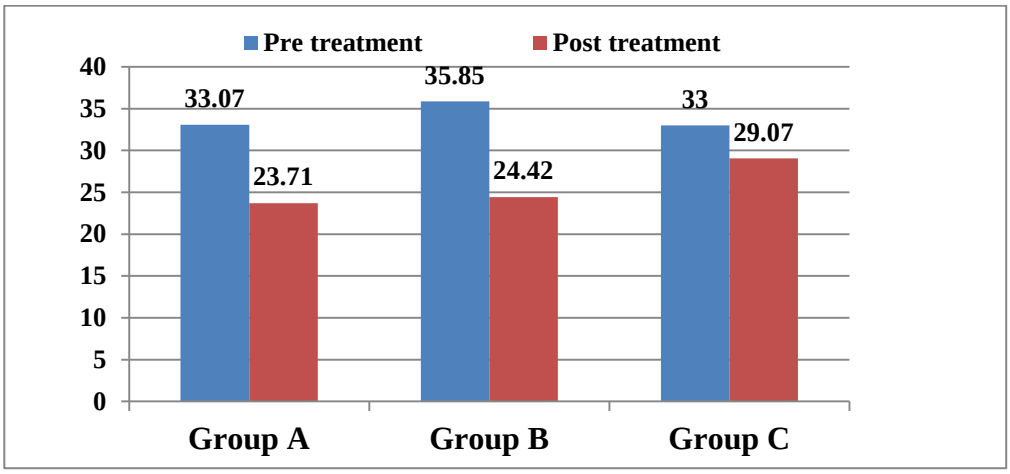

Figure (10): Mean values of disability scale score pre and post-treatment for group A, B and C

Discussion

Chronic low back dysfunction is one of the most common causes of inappropriate back function. PRT and MFR have been reported to be effective in the treatment of patients with CLBD. This study was conducted to investigate the effect of MFR, PRT and conventional physical therapy treatment on pain intensity level, spinal mobility and functional disabilities level in patients with CLBD. Also, to compare the difference between effect of MFR, PRT and conventional physical therapy treatment on pain intensity level, spinal mobility and functional disabilities level in patients with CLBD.

Forty two (30 male and 12 female) patients with CLBD diagnosed by orthopedist with continuous duration of complaining more than 3 months, their age ranged from 40 to 60 years. Patients were randomly assigned into three groups.

Group (C) consisted of 14 patients. They received conventional physical therapy treatment which included (infrared radiation, therapeutic exercise). Sessions were conducted three days / week every other day for 12 sessions.

Group (B) consisted of 14 patients. They received traditional physical therapy treatment and PRT. Sessions were conducted three days / week every other day for 12 sessions.

Group (A) consisted of 14 patients. They received traditional physical therapy treatment and MFR. Sessions were conducted three days / week every other day for 12 sessions.

The application of physical therapy program to three groups showed significant improvement in pain, functional disability and lumbar ROM (flexion, extension, right side bending and left side bending) that were measured before and after treatment in each group. pain intensity level was measured by VAS, functional disabilities level were measured by Oswestry Low Back Pain Disability Questionnaire and lumbar ROM was measured by the modified schober technique and the finger tip-to-floor technique was used to measure the lateral trunk flexion.

The results of this study showed that all the three programs were effective in reducing pain intensity level, functional disability and improving lumbar ROM.

Regarding MFR results of group (A), the current study revealed that there was a statistically significant improvement in pain intensity level, function disability and lumbar ROM within group (A). In comparison between groups there was no statistical significant difference in pain intensity level, function disability level and lumbar ROM (group A versus B). But there was statistical significant difference in pain intensity level, function disability level and lumbar ROM in group A than group C.

The results of this work were supported similar study done by [28] who found that MFR was effective in cases of masticatory myofascial pain dysfunction syndrome; he found that the treatment of temporalis trigger

points using MFR was extremely effective and completely resolved the jaw pain complaint.

Also, results were confirmed also similar study by [29] who used trigger points pressure and followed it by stretching exercises in one group, for the treatment of myofascial pain dysfunction syndrome of the neck and upper back muscles. Treatment sessions were for five days. The other group was given exercises only. The pain intensity has been reduced significantly after the treatment sessions in both groups in favor of the first group.

Also, the results were in line with [30] who compared the effect of pressure release, Phonophoresis and ultrasonic in patients with upper trapezius latent myofascial trigger point (MTP). Pain intensity, pain pressure threshold (PPT), and active cervical lateral flexion range of motion were assessed in 6 sessions. All 3 treatment groups showed decreases in pain and PPT and an increase in cervical lateral flexion range of motion compared with the control group. Both Phonophoresis and pressure release techniques showed more significant therapeutic effects than ultrasound. They concluded that all 3 treatments used in this study were effective for treating MTP.

Our findings supported by [31] who investigated the effect of manual pressure release on TrPs in the upper trapezius muscle; they found that 60 seconds of pressure release produced significant immediate decreases in sensitivity of TrPs and an increase of cervical ROM. Furthermore, the effect size in the treatment group was large, suggesting a strong clinical effect. The results suggested that pressure release is an effective therapy for TrPs in the upper trapezius.

Also, the results were in consistent with [32] who compared the effect pressure release with transverse friction massage and found a significant reduction in pain intensity for both groups but no difference between the groups. However, no conclusion regarding medium to long-term effectiveness can be drawn as the only outcomes measurement was immediately after treatment. He also reviewed the evidence for manual therapies in the treatment of MTrPs, and concluded that although a number of studies demonstrate statistically significant reductions in pain scores and pressure sensitivity, the current evidence neither supported nor refused effectiveness beyond placebo.

Also, the results were in line with [33] who compared stretching exercise with manual therapy on non-specific neck pain and disability. Measurements were done after 4 weeks and 12 weeks, and there were significant improvements in both groups in neck pain and disability with no difference between both groups. They concluded that low-cost stretching exercises can be recommended in the first instance as an appropriate therapy intervention to relieve pain, at least for the short-term treatment.

Also, the results come in agreement with [34] whoinvestigated the effect of MFR and spray stretch techniques on the lumbar and pelvic posture in chronic mechanical LBP; patients were divided into four groups. Patients received MFR, spray and stretch technique and a combination of both in three investigated groups respectively. Patients in the control group received electric heating pad, which was also given in the three treatment groups following each intervention. The dependant variables were the pain complaint, active ROM of the forward bending and rotation of the trunk. For all of the dependant variables, the combination of both techniques; MFR and spray stretch technique had the greatest effect than each technique alone. It was also concluded that each of these techniques alone was very valuable in the management of mechanical LBP, but MFR had greater effect than the spray stretch technique in improving ROM and reducing pain in these patients.

In contrast, [35] stated that pressure release therapy provides alternative treatments using either low pressure (pain threshold) and longer duration (90s) or high pressure (the average of pain threshold and pain tolerance) and shorter duration (30 s) for immediate pain relief. His results suggested that therapeutic combination of hot pack, range of motion exercise, stretch with spray, interferential current and myofascial release showed the largest reduction in pain and increasing cervical ROM.

In addition, [36] compared the effects of MFR with isometric contract-relaxes techniques on hip flexion. Significant increases in ROM were seen after MFR treatment but these increases were not significantly different than isometric contract-relax techniques.

Also, the results were in consistent with [37] who used conservative care for three case studies of shoulder impingement syndrome in tennis racquetball players; they were treated with subscapularismyofascial treatment using weekly sessions followed by therapeutic stretching. Patients had painful limited range of motion of

shoulder abduction and internal rotation before the treatment sessions. Significant improvement of pain intensity and range of motion was reported after 2-3 treatment sessions, and subjects had almost returned to painless function after the treatment sessions which were for six sessions.

The theoretical base for the chosen MFR technique was to free barriers within the deeper layers of fascia and the surrounding muscle fibers [28]. Through this process, it was believed that there would be significant improvement in ROM and pain [38]

Another study was conducted by [39]**.** He found that MFR has an effect on increasing AROM and decreasing pain.

A case study measured the effect of MFR on pain intensity level, trunk rotation and pulmonary function and found improvement in case of adult with idiopathic scoliosis [40]**.**

Another case study about female runner who had extremely chronic hamstring pain and deficit in flexibility in leg, she received myofascial release on her posterior leg and she had a significant reduction in pain [41]. [42] investigated the comparison between the effects of kinesio tape and MFR on pain, functional disability and quadriceps isokinetic peak torque in patients with chondromalacia patellae. Thirty patients with age ranged from 15 to 30 years old participated in this study. He found that kinesio tape has more significant effect on pain intensity level, isokinetic quadriceps peak torque and functional ability than myofascial release.

The results showed no statistically significant difference between groups (kinesio tape and MFR) might be due to number of session not enough to appear the significant of MFR or might be due to the difference of diseases. [43] investigated the efficacy of MFR added to exercises as home program versus joint mobilization added to the same home program in treatment of frozen shoulder by measuring pain, function, and range of motion. The results of this study suggested that either MFR or joint mobilizations are equally effective interventions for use in patients with shoulder adhesive capsulitis, except for the range of shoulder external rotation which was more significantly improved by the use of shoulder joint mobilization.

From above we suggested that effect of MFR in patient with CLBD may due to general increase in health due to the increase in water volume (bound water) in the ground substance (nutrient and waste exchange) ,promotion of relaxation and a sense of well-being ,elimination of general pain and discomfort ,increased proprioception, improved joint range of motion , improved muscle function ,improved digestion, absorption and elimination ,restored balance and promotion of correct posture .

The results of group B (PRT) showed statistically significant differences in pain intensity level function disability and lumbar ROM within group. There was no statistical significant differences between A (MFR) and B (PRT) in pain intensity level, lumbar ROM, and functional disability level ($p<0.05$), There was statistical significant differences between B (PRT) and C (control) in pain intensity level and lumbar ROM but there was no statistical significant differences in functional disability level ($p<0.05$).

The result of PRT could be attributed to [44] who proposed that a nociceptive hypothesis that tissue damage in dysfunctional muscle can be reduced by the positional release mechanism utilized by PRT. They suggested that relaxation of the damaged tissues may be achieved by placing patients in a position of ease which may advance local perfusion of fluids (i.e. blood and lymph) and enhance the removal of sensitizing inflammatory mediators.

Also, the result were confirmed by [45] who reported that evidence of decrease in pain and muscle tension in upper trapezius, which confirm the assumptions that the application of PRT seems to relieve muscle spasm and restore appropriate painless movement and tissue flexibility.

Also, these finding were in agreement with [46] who performed a study about ilio-sacral diagnosis and treatment as effect of positional release and rehabilitation exercise on gluteus medius, piriformis and pubic symphysis on low back pain patients and found that there is significant improvement in pain and ROM.

Furthermore, the results of this group matted with [47] who carried out a case report for patient with grade 11 ankle sprain, 14 years old. The benefits were recorded by way of the analgesic effect of PRT and improving function. A decrease of two points on a numeric pain rating scale was reported for overall pain after two

months, as was, a decrease in tenderness for 10 out of 13 tender points TrPs. These analgesic effects were considered clinically significant, and they are suggestive of the need for more formal investigation.

Also, these results also were supported by [48] who claimed that the application of PRT may be effective in producing hypoalgesia and decreased reactivity of TrPs in the upper trapezius in subjects with neck pain. Results of this study showed that effect sizes for the VAS for pain intensity between pre and post intervention measurement following the application of PRT technique.

More ever, [49] carried out a trial on the use of positional release on iliotibial band friction syndrome and found that the use of positional release as a treatment modality for the athlete can experience reductions in pain and be capable of returning to full activity in less than three weeks from initiation of treatment, compared to an average of 4-6 weeks of conventional therapy.

Also, the results were confirmed by [50] as he ensured evidence of increased pain free grip strength and decreased pain scores after PRT applied to the area of lateral epicondyle and the cervicothoracic spine.

Furthermore, [51] examined the reliability, validity and effectiveness of strain counter-stain (SCS), the experimental design employed a convenience sample of 49 volunteers with bilateral hip tender points, he found significant pain decrease in both muscle groups demonstrated with the VAS at end of treatment after application of SCS.

More ever, [52] carried out a study to investigate the effects of positional release on the symptoms associated with delayed onset muscle soreness (DOMS), Subjects completed VAS for the perceived pain ratings. Pain threshold was measured using a pressure algometer. A standard goniometer was then used to evaluate the extension and flexion ROM at the elbow joint, the results showed that the effects of DOMS were reduced with positional release.

The previous findings were in agreement with [53] who found PRT was effective in treating severe neurological patients. PRT seemed to have a calming effect on the level of excitability within the facilitated segment to decrease the threshold in the facilitated segment and provide the CNS with an opportunity to normalize neural activity.

These results come in agreement with**)** [54] who stated that PRT is an effective intervention for resolution of pain and improvement of ROM from one treatment session to the next, and at one month following discharge from treatment in patients who present with cervical TrPs.

Furthermore, these results were in agreement of a randomized control trial which was performed on 30 male and female subjects with complain of neck pain and associated unilateral upper trapezius spasm with interventions in the form of conventional physiotherapy and PRT, and suggested that PRT can be useful in alleviating the neck pain and improve the functional ability as shown in terms of VAS and Neck Disability Index [55]. [56] showed that confirmed the assumptions that the PRT seems to relieve the muscle spasm and restore the appropriate painless movement and the tissue flexibility; the relaxation of tensioned muscle fiber promotes normalization of local vascularization and decreased pain, caused by ischemia; and the action of PRT on the nociceptive system can be exercised through the relaxation of the surrounding tissues and the consequent improvement in the vascular and interstitial movement.

Regarding results between groups that showed no statistically significant difference in pain intensity level and lumbar ROM (group B versus A). [57] reported that after 8 sessions of intervention following application of (MET and PRT) in acute low back pain a randomized control trial , both groups showed that there was no statistically significant difference between each other and were equally effective in reducing pain ,functional disability and increase in ROM. The results showed no statistically significant difference between groups (MET and PRT) might be due to number of session not enough to appear the significant or might be due to the stage of disease acute low back pain not chronic low back dysfunction.

The results of the current study coincided with the results of [58] that showed that a gentle and passive technique, PRT has been advocated for the treatment of acute, subacute, and chronic somatic (whole-body) dysfunction for all ages.

Also, these results were supported by [59] who showed that the application of PRT may be an effective treatment for pain relief and to reduce resting baseline EMG signals in the upper trapezius muscle with a TrPs.

Also, the results were in line with [60] who investigated the effects of manual pressure release (MPR) and PRT in comparison with a control group regarding pain intensity and neck active range of motion (AROM) in patients with myofascial pain dysfunction syndrome of the upper trapezius muscle. The study showed an immediate decrease in pressure pain threshold of the trapezius muscle, a reduction of muscle TrPs sensitivity and increase in AROM in the group B and C in comparison with control group.

Also, these findings were consistent with [61] who conducted a study to compare between the efficacy of post isometric relaxation and PRT on pain intensity level, ROM and functional activities in patients with CLBD. The results revealed that there was no significant difference between PIR and PRT on pain intensity level, ROM and functional activities. Both PIR and PRT were shown to be effective in reducing pain intensity level, improving ROM and function in patients with CLBD, but no statistical significant difference was proven between both of them.

Also, in agreement with our results [62] studied the efficacy of PRT and post isometric relaxation technique in treatment of patients with cervical spondylosis. The results showed that both of PRT and post isometric relaxation technique were effective in reducing cervical pain and functional disability. PRT were effective in increasing cervical ROM especially flexion motion.

These results also were supported by [63] who conducted a study to compare between the effects of PRT and kinesio taping technique on pain intensity level, pressure pain threshold level and functional disability in patients with lower back myofascial pain syndrome. The results revealed that there was no significant difference between PRT and kinesio taping on pain intensity level, pressure pain threshold and functional activities.

Also, in agreement with our results [64] the purpose of this study was to compare between the effect of stretching exercises versus PRT on pain intensity, functional neck disability and range of cervical mobility in patients with cervical spondylosis. The results reported that both of stretching exercises and PRT showed a significant improvement in pain intensity, improvement in neck functional disability and both techniques increased the range of cervical mobility; with no significant difference between both groups.

Also**,** [65] reported thatseveral studies suggest PRT may reduce upper trapezius pain. Subjects with self-reported upper trapezius stiffness and pain were randomly assigned to receive PRT or sham positioning treatment in a blinded study. Both sham (d = 0.40) and PRT (d =0.71) immediately reduced palpation pain

Another study supporting this work is the study done by [56] evaluated the treatment of cervicobrachialgia by PRT. The study showed that the PRT for the treatment of patients with cervicobrachialgia has proved effective because it reduced the muscle tension in the upper trapezius, decreased the musculoskeletal pain and relieved muscle spasm.

Also, [66] reported that there was significant reduction in pain as assessed by VAS where PRT helps in reducing tender point in the affected muscle by the mechanism of automatic resetting of the muscle spindles.

Also, these results were supported by [67] who stated that PRT could be beneficial in the treatment of neck pain associated to unilateral upper trapezius tender points. PRT was found to produce significant pain relief.

Also, in agreement with our results [68] investigated the effectiveness of PRT and deep transverse friction massage on gluteus medius trigger point. The findings of both groups showed significant improvement in pressure pain threshold when comparison is made within the group.

Furthermore 260 evaluated the efficacy of osteopathic manual therapy (OMT) for patients with acute ankle sprain. (OMT included myofacial release, stretch and positional release). Patients in the OMT study group had a statistically significant improvement in edema, pain and trend toward increased ROM immediately following intervention with OMT.

In contrast, [69] conducted studies to investigate the effect of positional release therapy technique to increase hamstring flexibility, Hamstring flexibility was assessed before and after each technique by measuring the popliteal angle during maximal active knee extension performed in sitting, A blinded evaluator measured popliteal angles on digital photographs using a standard protractor. The finding suggested that the PRT technique is not effective to increase knee extension in healthy subjects who have decreased hamstring flexibility.

In contrast, [70] conducted study to investigate the effect of positional release therapy technique to increase hamstring flexibility, Hamstring flexibility was assessed before and after each technique by measuring the popliteal angle during maximal active knee extension performed in sitting, A blinded evaluator measured popliteal angles on digital photographs using a standard protractor. The finding suggested that the PRT technique is not effective to increase knee extension in healthy subjects who have decreased hamstring flexibility.

Also**,** these findings were in agreement with [71]**.** Theyreported on four case studies of patients with low back pain treated with PRT protocols. The authors reported improvements in the outcomes measured for disability levels (Oswestry Low Back Pain Disability Questionnaire) and pain (Mc Gill Pain Questionnaire) in all cases.

In addition[72] found that in a retrospective review of 20 patients suffering from chronic localized myofascial pain, the use of the PRT could be beneficial in reducing pain and improving function.

Positional release technique decreases joint and muscle pain, decreases joint swelling and stiffness and so increase mobility and a quality of life **8 .**

Also, [73] conducted a study on patients were referred with a cervical sprain, neck stiffness, weakness, and pain, after injury due to an explosion. Treatment was included PRT for the upper trapezius muscle tender points. A statistically significant reduction in pain scores measured by the Numeric Pain Rating Scale, and increased cervical flexion strength measured by hand-held dynamometry and improved disability scores measured by the Neck Disability Index.

In accordance to our results, the work of [74] showed that PRT for the treatment of patients with cervicobrachialgia has proved effective because it reduced the muscle tension in the upper trapezius and the results demonstrated a progressive decrease of the musculoskeletal pain in each session, with consequent improvement of posture and daily life activities.

In agreement with our results the work of [75] comparing PRT with exercises versus exercises alone in patients with LBP. The results showed that pain rated on the VAS demonstrated no difference between groups over time and neither did any of the other measured outcomes. The only significant difference between groups was shown at two weeks; the patients in the PRT group showed a significant improvement compared to the control group.

From all of the above, it was approved that application of PRT is effective as a treating method for CLBD patients owing to its analgesic effects so it helps in reducing pain and functional disability and improving lumbar range of motion.

Regarding conventional physical therapy in group (C) the results revealed a statistically significant improvement in pain intensity level, function disability and lumbar ROM by conventional physical therapy (infrared radiation, therapeutic exercise) within group. But less than group (A) and group (B).

Heat application had been proven to be effective in relieving pain, reducing muscle spasm and disability in acute and chronic LBP [76]**.**

Strengthening exercises for lower back muscles increased the strength of weak muscles which increased the stability of the spine which helped in reduction of pain intensity level [77]**.** Repeated muscular contraction lead to activation of ergoreceptors (the ending of A delta fibers) which stimulate enkephalinergic nerve cells in the thalamus which decrease the pain and improve functional activities [78] Also, strengthening exercises influence the fluid dynamics of the injured area as the stasis of the fluid and alteration of the chemical environment of the

tissues which stimulate the nociceptor and cause reduction of pain [79]**.**

These results are in agree with the previously published results of research done by [80], who investigated trunk muscle strength and the effect of trunk muscle exercises in patients with CLBD where the patients had reduction in extension strength of the trunk. Trunk extensors strengthening exercises were useful for increasing muscle strength and improving pain intensity level in LBD patients.

This was also supported by [81] who examined the effects of isolated lumbar extensor muscle exercises in patients with CLBD after ten weeks of exercise program. Results indicated a significant increase in isometric lumbar extension strength for the treatment group and a significant reduction in reported pain in patients with CLBD.

Furthermore, a study conducted by [82] who examined the trunk extensors strength in patients with LBD and effect of the short-term impact of trunk extensors strengthening exercises on the same patients. Decreases in trunk extensors strength were important factors in CLBD, and a trunk extensors strengthening program would be helpful in reducing the pain.

Both flexion and extension exercises help in relieving pain, this agreed with **83**who reported that both the spinal flexion and extension exercises provided significant reduction in LBP severity in patients with CLBD.

Also, this finding was supported by [84] who found that functional ability and ROM of lumbar flexion, extension, right side bending and left side bending improved after physical therapy treatment included strength and flexibility exercises because of increase muscle strength, reduction of pain, improve muscle flexibility and improve motor control skills.[85] reported that increased trunk flexion ROM after flexion and extension exercises due to increased flexibility and mobility of the trunk.

Dynamic strengthening exercises increased back muscle strength resulting in increased stability of lower back and reduced the load and strain in passive structures responsible for stability i.e. ligaments and joints and this improve function and ROM [86]. [87] reported that improvement of patients physical activities, psychological status and relief of pain are responsible for decrease disability and increase ROM.

Concerning to the functional disability level there was significant decrease of functional disability post treatment of the traditional treatment group.

The functional activities in patients with chronic LBD are greatly influenced due to painful limited mobility of the spine and lack of strength and motor control which are guarding the patient during performance of the functional activities like sitting, standing and walking **.**The patient's functional activities improved as the pain decreased and the lumbar ROM increased. In addition, the exercise program aimed to increase individuals' confidence in the use of their spine and overcome the fear of physical activity [88].

In current study the exercises program was used as strengthening exercises for back muscles and abdominal muscles to prevent muscular imbalance that could result from shortening of soft tissue in lumbar region or weakness of muscles. This exercises program was easy applicable for all patients during sessions. Strengthening exercises for back muscles and abdominal muscles were found to be effective in reducing functional disability in patients with CLBD and these results were in line with many studies which indicated that LBP can produce reflex muscle inhibition for paraspinal muscles to prevent movement and protect the structures So, strengthening of these muscles reduces pain and improves function [89,90,91].

This finding also, has been supported by [92] who found that dynamic exercises for back and abdomen with stretching exercises was effective in reducing functional disability**.**

Also, another study evaluated the effectiveness of 3-month high-intensity training and low-intensity training of isolated lumbar extensors on CLBD patients. Functional disability and back muscle strength were evaluated. The results showed that the two treatment programs lead to comparable improvements in all outcome measures. High-intensity training as well as low-intensity training of the isolated back extensors was effective in increasing back strength and improvement of functional disabilities of CLBD [93]**.**

In summary, the findings of this study demonstrated that group (B) that received PRT and conventional physical therapy showed improvement in pain intensity level, functional disability level and lumbar ROM, group A that received MFR and conventional physical therapy showed improvement in pain intensity level, functional disability level and lumbar ROM, also group C (control) showed improvement in pain intensity level, functional disability level and lumbar ROM. There would be no significant difference between the effect of PRT and MFR on pain intensity level, lumbar ROM and functional disability level in patients with CLBD. There was improvement of group A(MFR) than group C (control) in pain intensity level, functional disability level and lumbar ROM. There was improvement of group B (PRT) than group C (control) in pain intensity level and lumbar ROM. There was no significant difference between the effect of group B (PRT) and group C (control) for function disability level.

Conclusion

Positional release techniquewith conventional physical therapy is more effective than conventional physical therapy in reducing pain, increasing ROM (lumbar flexion, extension and lateral side bending) and functional disability. Myofascial release technique with conventional physical therapy is more effective than conventional physical therapy in reducing pain, increasing the ROM (lumbar flexion, extension and lateral side bending) and functional disability. Both PRT and MFR were shown to be effective in reducing pain intensity level, improving of spinal mobility and function level in patients within CLBD but, no statically difference was proven between them

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