

[ORIGINAL ARTICLE]**Mckenzie Approach for Quadratus Lumborum Dysfunction in Patients Suffering from Chronic Low Back Pain with Borderline Bmi**Ali Askar¹, P Mahendran², K Kalaiselvi³¹Physiotherapist, Apurva Multispeciality hospital, Bangalore²Principal, ³ Professor, Acharya Institute of Health Sciences, R. T. Nagar, Bangalore**ABSTRACT**

Background: Low back pain is the common condition people with borderline McKenzie. Method are popular active treatment approach that include both exercise and information for patient with chronic LBP.

Objectives: To assess the effectiveness of McKenzie approach for quadratus lumborum dysfunction in people with borderline BMI.

Design: Single group, pre and post experimental study, single center included patient with LBA.

Methodology: The experimental study included 26 people with low back pain based on Inclusion and exclusion criteria. Subjects were explained about the McKenzie exercises. Oswestry disability index and VAS scales was taken as outcome measures and checked before and after completion of 4 weeks.

Result: The study shows significant improvement when assessed post study used in VAS scale and OSWESTRY scales with $P < 0.005$. Hence reject the null hypothesis and accept alternate hypothesis. Which states that significant effect of McKenzie protocol reducing severity of back pain and improving functional activity.

Conclusion: The study has concluded that McKenzie approach for quadratus lumborum dysfunction in patients suffering from CLBP with borderline BMI has shown great improvement by reducing pain and improving functional activity. So, further effort should be forward promoting McKenzie approach as a part of physiotherapist rehab service whenever necessary with goal of reducing LBP.

Keywords: *Low Back Pain, Mckenzie, BMI, VAS.*

Introduction

Low back pain is that the leading worldwide reason behind years lost to disability and its burden is growing alongside the increasing and ageing population. Characterised by pain between the twelfth rib and also the sacrum, associated or not with radiation to the lower limbs, causing limitation of current activities and disability^[1].the epidemiology of chronic low-back pain with no associated work disability or compensation. Chronic low-back pain has also become a diagnosis of convenience for several folks that are literally

disabled for socioeconomic, work-related, or psychological reasons. In fact, some people argue that chronic disability in back pain is primarily associated with a psychosocial dysfunction.

Because the validity and reliability of form of the present data are uncertain, caution is required in an assessment of the data on this type of pain applied to spine that led to LBP^[2]. The McKenzie method is widely considered to be a highly effective program for patients with nonspecific spinal pain. developed by robin McKenzie in New Zealand in 1981. It is a stuffed with life therapy that involved repeated measurement or sustained positions and has an

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academic component with the wants of minimizing and disability & improving spinal mobility^[3].this method has 3 basic components 1) evaluation 2) intervention exercises 3) prevention. The presence of centralization is claimed to good prognosis in patients with LBP 4) Classification within the Mc Kenzie method follows as common comprehensive clinical examination including examination of posture and ROM, along with the assessment of patient's symptomatic response to differ at loading strategies applied to spine that led determine the classification of LBP into 3 syndromes.

1. Derangement syndrome
2. Dysfunction syndrome
3. Postural syndrome

Quadratus lumborum is a posterior pair's muscle that originates from the posteromedial iliac crest and inserts into the medial border of the twelfth rib and therefore the transverse processes of the primary to fourth lumbar vertebrae. The lateral free border of quadratus lumborum is angled from craniomedial to caudo-lateral. The quadratus lumborum and psoas major muscles traverse posterior to the lateral and medial arcuate ligaments of the diaphragm, respectively. Posterior to the quadratus lumborum muscle lies the erector spine muscle group, consisting of the multifidus, longissimus, and iliocostalis^[5].as a structure that helps to support the body and influence movement.as a structure this muscle help to support body and influence movement, and help to take care of neutral position of the spine.

Obesity could be a medical condition with excess body fat accumulation to an extent that has negative effect on health.in 2005 it had been estimated 33%of world adult population now its projected upto57%.the combination of excess body fat and reduced muscle mass or Strength and should play role in functional disability. These factors: obesity and Low condition are frequently associated/both may impair muscle strength. The McKenzie method has a very important role to play altogether patients with CLBP in terms of reliably classifying them into distinct, validated subgroups with distinctly different treatment needs^[6]. When an individual is obese, any added weight within the midsection shifts the pelvis forward and cause the spine to curve excessively inward. We call this as a hyper lordosis or sway back.it is the condition that exert abdominal

pressure to back muscle that are forced inReality the burden.

Body mass index is defined because the body mass divided by the square of the body height, and is expressed in units of kg/m², resulting from mass in kilograms and height in meters.

Common use of BMI is to test how far a private weight from normal person. The WHO regards an BMI for an adult is eighteen.^[5] as underweight which may indicate the person is malnourished or having some health problems while BMI is equal or greater than 25 is indicating that the person is overweight and if it's 30 or it considered as obese. A high BMI are often an indication of an excessive amount of fat on the body which Suggests there's an opportunity of developing certain serious conditions like heart diseases, High pressure level, and diabetes. Were low BMI may cause health problems, including bone loss, decreased immune function, and anemia. However, we will reduce body fat By employing a proper diet likewise nearly as good exercise. That way it can reduce all the issues related with body health as mentioned above. However, it shouldn't be the Sole measure for a private to assess whether their weight is good.

Increasing in BMI is a one of the causes of LBP. Which can be reducing the QOL of life in the people who are suffering from back pain. Majority of the survey's which are done with LBP been proved the statement. This in turn may reduce the productivity of the people and have an impact on their QOL. It is essential to perform a proper holistic intervention for such patients that can be easily done by patients themselves in their busy schedule under proper guidance. Including McKenzie approach will increase the effectiveness of back muscle and can help to stabilize the posture. Therefore, it is very essential to determine and effective and holistic treatment of McKenzie approach for the people who have LBP with borderline BMI to improve their QOL and productivity.

Methodology

This study adopted a pre- and post-experimental design conducted over a duration of 3–4 months. A total of 26 participants were recruited through convenient sampling based on inclusion and exclusion criteria. Participants were between the ages of 20–40 years with a borderline BMI and chronic low back pain. Exclusion criteria included conditions such as IVDP, spondylolysis,

spondylolisthesis, spinal surgeries, and nerve root compression. Data collection involved the use of outcome measures like the Visual Analog Scale (VAS) and the Oswestry Disability Index (ODI). Participants were instructed on the McKenzie exercises and underwent a structured 4-week intervention. Source of data is from Apurva Mother and Child Hospital, Bangalore. Study design is pre and post experimental study. Duration of the study is 3-4 months. Sample size is 26. Sampling procedure is convenient sampling. The following materials are used for the study: Exercise mat, Goniometer, marker, calculator, weighing machine, VAS and Oswestry disability Index scales. Inclusion criteria are Gender: both male and female, age: 20-40, BMI - <24 and above and those who are having chronic back pain. Exclusion criteria are: IVDP, Spondylolysis, Spondylolisthesis, spinal surgeries and nerve root compression. Outcome measures are VASO and Oswestry disability index. The specific steps taken to diagnose QL dysfunction include Patient History - Understanding symptoms like pain, stiffness, or functional limitations, Physical Examination - Using palpation, range of motion tests, and postural assessments, Special Tests- Applying specific tests like the Resisted Hip Hike, Side-Bending Provocation, and Quadratus Lumborum Stretch tests to identify QL dysfunction.

Procedure

26 subjects were recruited based on inclusion and exclusion criteria. Subjects were explained about the McKenzie exercises that are to be performed and an informed written consent was taken from the subjects.

The following are the exercises^[7]. Assessment and written consent will be taken from the subject who will participate in the study.

Exercises

1) Trunk Flexion:

- Lying down: From a supine position with knees and hips flexed, the patient raises the knees toward the chest, applying extra pressure using the hands.
- Seated: Seated on a chair, with knees and hips flexed at 90 degrees, the patient bends forward until the head is between the knees and the hands are as close to the floor as possible. The patient can hold on to the ankles, bringing the trunk even closer to the knees.
- Standing: With feet shoulder-width apart, the patient places his or her fingers on the front of the

toes, gliding hands toward the floor and keeping the knees extended.

2) Trunk Extension:

- Lying down: The patient begins in a prone position with the palms of the hands on the floor just in front of the shoulders. The patient extends the elbows, elevating the upper part of the body, while the pelvis and thighs remain relaxed.
- Standing: With feet shoulder-width apart, the patient places his or her hands at the base of lower back, fingers pointed toward the floor, and extends the trunk backward as far as possible, keeping the neck relaxed.

3) Lateral Shift:

- Standing with upper arm support: With feet placed shoulder-width apart and the upper arm bent at 90 degrees of elbow flexion with the hand contacting the lateral trunk. Using the hand, supported by the upper arm, the patient manually shifts the pelvis to the opposite side.
- 3 sets of 10 repetitions could be performed sequentially, with a small break between repetitions or split into different times of day, according to the response of the patient.
- The exercise training for all subject was given



Fig. 1: Trunk Extension in prone lying position



Fig. 2 : Trunk extension in standing position



Fig. 3 :Trunk flexion in lying down position.



Fig. 4 : Trunk flexion is sitting position.



Fig. 5 : Trunk flexion in standing position.



Fig. 6: Lateral shift in standing position

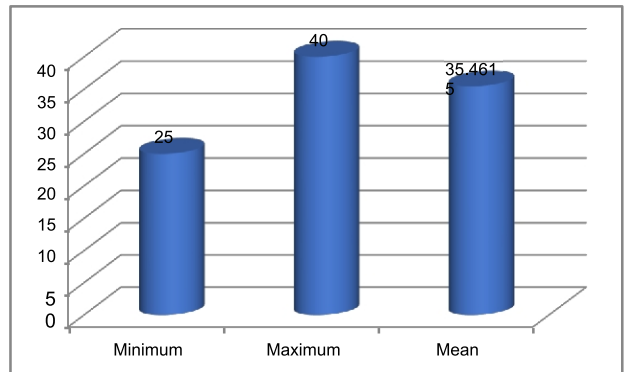
Result

Statistical analysis of the data was done using SPSS 23.0. Descriptive statistics were calculated and summarized. Which includes mean and standard deviation. Inferential statistics had been carried out in the study pre and post comparison was done using paired t test. Level of significance was set at 5%.

Table1 : Showing mean and standard deviation of age of the patients

	N	Minimum	Maximum	Mean	Std. Deviation
Age in years	26	25.00	40.00	35.4615	4.13986

The study shows average age of the 26 patients included in the study is 40±4.139 years with minimum of 25 years and maximum of 40 years.

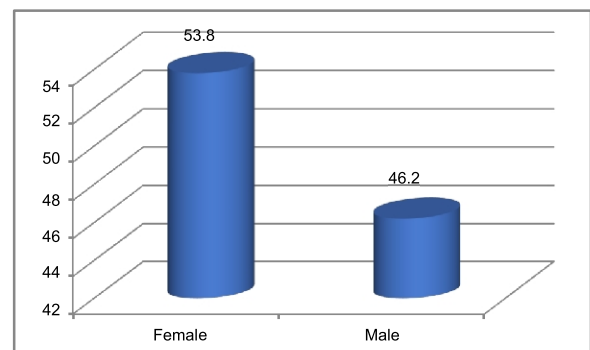


Graph 1 : Showing average age in years

Table 2 : Distribution on the basis of gender

	Frequency	Percent
Female	14	53.8
Male	12	46.2
Total	26	100.0

The study includes 26 patients with majority 14(53.8%) female and 12(46.2%) males

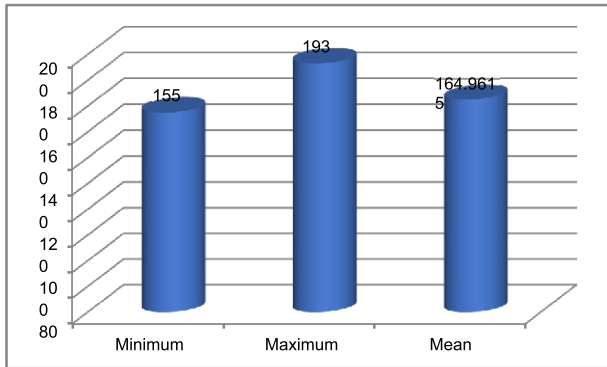


Graph 2 : Showing frequency percentage on the basis of gender

Table 3: Showing mean and standard deviation of height

	N	Minimum	Maximum	Mean	Std. Deviation
Height	26	155.00	193.00	164.9615	8.79764

The table depicts, average height of the patients is 164.96±8.797 cm with minimum of 155 cm and maximum of 193 cm.

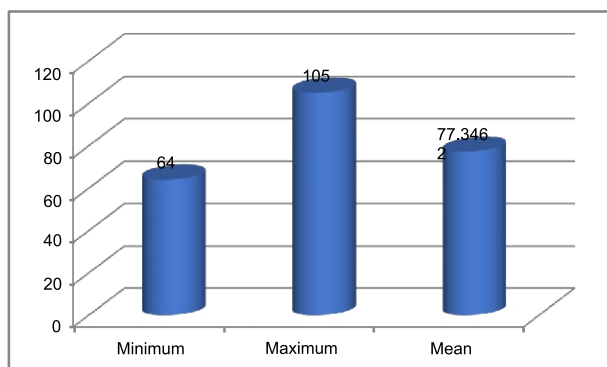


Graph 3: Showing mean height of the patients

Table 4 : Mean and standard deviation of weight

	N	Minimum	Maximum	Mean	Std. Deviation
Weight	26	64.00	105.00	77.3462	10.13091

The table shows, average weight of the patients is 77.34±10.130 kg with minimum of 64 kg and maximum of 105 kg.

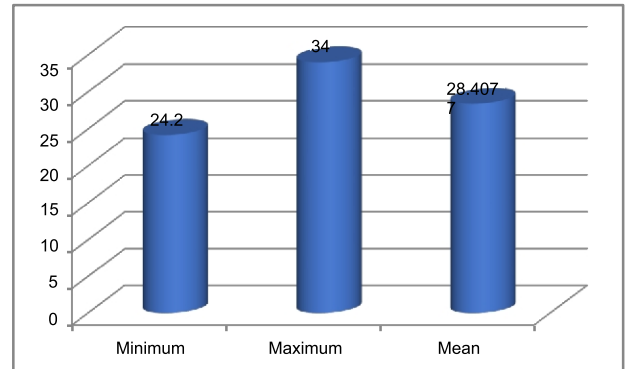


Graph 4: Mean weight

Table 5: Mean and standard deviation of BMI

	N	Minimum	Maximum	Mean	Std. Deviation
BMI	26	24.20	34.00	28.4077	2.90116

The table shows average BMI is 28.40±2.901 with minimum of 24.2 and maximum of 34.0.

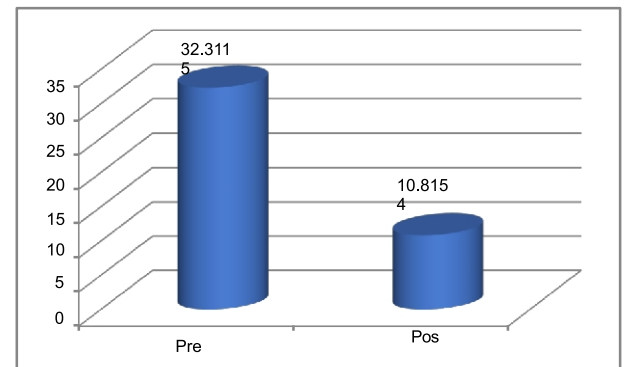


Graph 5: Mean BMI of the patients

Table 6 : Pre post comparison in Oswestry Disability

	Mean	Std. Deviation	Average improvement	t value	Result
Pre	32.3115	19.40386	21.49	7.224	P<0.001
Post	10.8154	13.22203			

The average pre-Oswestry disability score is 32.311±19.403 and the post score reduced to 10.815±13.222 with an average decrement of 21.49 and p<0.005, The analysis shows Oswestry disability score has significantly decreased after the treatment.

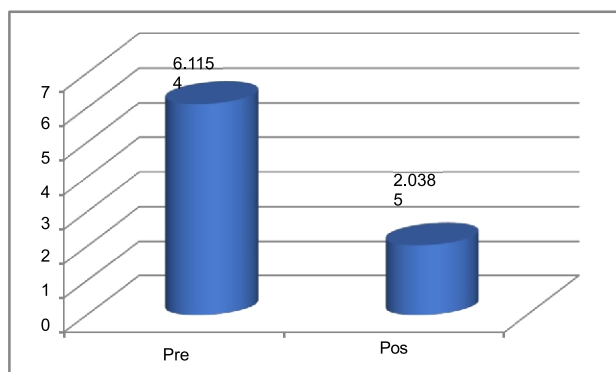


Graph 6: Mean Oswestry disability score in pre and post treatment

Table 7 : pre post comparison of VAS score

	Mean	Std. Deviation	Average improvement	t value	Result
Pre	6.1154	1.14287	4.076	15.883	P<0.001
Post	2.0385	1.77721			

The average pre-VAS score is 6.115±1.142 and the post score reduced to 2.038±1.777 with an average decrement of 4.076 and p<0.005, The analysis shows VAS score has significantly decreased after the treatment.



Graph 7: Mean VAS score in pre and post treatment

Discussion

The objective of the study was to check the effectiveness of McKenzie approach for quadratus lumborum dysfunction in patients suffering from chronic low back pain with borderline BMI. The study reveals that there was significant improvement in pain with $P < 0.005$, The analysis shows VAS score is slightly decreased after the treatment. This result supports prior research which stated that positive effect on CLBP while doing McKenzie approach.

The findings of this study indicate that McKenzie approach can decrease the effect of pain in the low back. The reliability of the VAS for the disability in patients with chronic musculoskeletal pain is good, the validity of the VAS for disability was not conformed. Because of a weak correlation with other disability instruments and a strong correlation with the VAS for pain, however, its validity is questionable⁸. The study shows average pre-Oswestry disability score is 32.311 ± 19.403 and the post score reduced to 10.815 ± 13.222 with an average decrement of 21.49 and $p < 0.005$. where the average pre-VAS score is 6.115 ± 1.142 and the post score reduced to 2.038 ± 1.777 with an average decrement of 4.076 and $p < 0.005$.

Health related quality of life patients with long term LBP decreases with severity of pain. The McKenzie protocol for back extensor has a significant therapeutic effect on health-related quality of life in patients with long term low back pain, however the addition of back extensor exercise to McKenzie protocol lead to higher improvement on health-related quality of life (HRQoL)⁹. There is very low to moderate quality evidence that

MCE (motor control exercise has clinically important effect compared with manual intervention

for CLBP¹⁰.

Increase BMI is a risk factor for LBP. The role of physical activity is shown to be greater consequences in the overweight and obese population¹¹. our findings consistently show that overweight and obesity are risk factors for LBP in men and women. Maintaining a healthy body weight may be the one of the factors preventing the outcomes of LBP¹². The result of the study indicates that when McKenzie approach is done under the guidance of a physiotherapist. Its shown significant improvement. Another study report that McKenzie group had a greater improvement in disability at 1 month. Staying active means keeping your body functioning at a high level. Regular exercise will maintain the performance of your lungs and heart to most efficiently burn off excess calories and keep your weight under control. Exercise will also improve muscle strength, increase joint flexibility and improve endurance. In general meaning, physical fitness is a general state of a good physical health.

In our study patient faced issues in interest, time constraint which was overcome by regular intervention. LBA hinders in ADL and required to be addressed by an approach to reduce the pain and hence McKenzie approach was proved and beneficial approach used to reduce the pain. Further researches to be carried out to design the effectiveness of McKenzie approach for obese people on LBP. It could enhance and provide further understanding of the McKenzie approach quadratus lumborum dysfunction in patients suffering from CLBP.

Pain reduction and improved disability may resulted from centralization of symptoms, enhanced spinal mobility, and strengthened musculature through targeted McKenzie exercises.

Conclusion

The study concluded that McKenzie approach for quadratus lumborum dysfunction in patient suffering from CLBP with borderline BMI has shown great improvement by reducing pain and improving functional activity. More research effort should be directed towards developing intervention with the goal of improving the strength of back muscle in the demographic group. This might

prevent or delay the progression of long-term health complications.

Conflict of Interest

The authors declare no conflicts of interest regarding the publication of this study

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References

- 1) Buchbinder R, van Tulder M, Öberg B, Costa LM, Woolf A, Schoene M, et al. Low back pain: a call for action. *Lancet*. 2018 Jun 9; 391(10137):2384-8. Doi: 10.1016/S0140-6736(18)30488-4. PMID: 29573871
- 2) Lam OT, David PT, Matthew PT, Paul PT, Richard PT, Shawn PT. Effectiveness of the McKenzie Method of Mechanical Diagnosis and Therapy for Treating Low Back Pain: Literature Review with Meta-analysis. *J Orthopedic Sports Physiotherapy*. 2018 Mar 30. doi: 10.2519/jospt.2018.7562. PMID: 29602304
- 3) Busanich BM, Verscheure SD. McKenzie Therapy Improves Outcomes for Back Pain. *PMCID: PMC1421491*. PMID: 16619104
- 4) May S, Donelson R. Evidence-informed management of chronic low back pain with the McKenzie method. *The Spine Journal*. 2008 Jan 1;8(1):134-41
- 5) Elsharkawy H, El-Boghdadly K, Barrington M. Quadratus Lumborum Block: Anatomical Concepts, Mechanisms, and Techniques. 2019. DOI: 10.1097/ALN.0000000000002524
- 6) Upadhyay J, Farr O, Perakakis N, Ghaly W, Mantzoros C. Obesity as a disease. *Med Clin North Am*. 2017 Oct.
- 7) Garcia AN, Costa LC, da Silva TM, Gondo FL, Cyrillo FN, Costa RA, Costa LO. Effectiveness of Back School versus McKenzie Exercises in Patients with Chronic Nonspecific Low Back Pain: A Randomized Controlled Trial. *Physical Therapy*. 2013 Jun; 93(6):729-37. doi: 10.2522/ptj.20120414. PMID: 23431213.
- 8) Boonstra AM, Preuper HR, Reneman MF, Posthumus JB, Stewart RE. Reliability and validity of the visual analogue scale for disability in patients with chronic musculoskeletal pain. *International journal of rehabilitation research*. 2008 Jun 1;31(2):165-9.
- 9) Jimenez A. Influence of McKenzie Protocol and Two Modes of Endurance Exercises on Health-Related Quality of Life of Patients with Long-Term Mechanical Low Back Pain.
- 10) Saragiotto BT, Maher CG, Yamato TP, Costa LO, Menezes Costa LC, Ostelo RW, Macedo LG, Cochrane Back and Neck Group. Motor control exercise for chronic nonspecific lowback pain. *Cochrane Database of Systematic Reviews*. 1996 Sep 1;2016(11).
- 11) Smuck M, Kao MC, Brar N, Martinez-Ith A, Choi J, Tomkins-Lane CC. Physical activity influences the relationship between low back pain and obesity. *Spine J*. Doi: 10.1016/j.spinee.2013.11.010. PMID: 24239800.
- 12) Zhang TT, Liu Z, Liu YL, Zhao JJ, Liu DW, Tian QB. Obesity as a risk factor for low back pain: a meta-analysis. *Clinical spine surgery*. 2018 Feb 1;31(1):22-7.
- 13) Jhaveri B, Savaliya G. An Observational Study to Determine and Compare Effects of Various Physical Test Components on BMI of School-Going Children. *Ann Physiotherapy Occupation Therapy*. 2018;1(2):1-6.