International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effectiveness of Theragun Therapy and Mckenzie Technique on Pain and Range of Motion in Individuals with Mechanical Low Back Pain

Madhu V[1], Dr Mayank Shukla[2]

[1]Mpt Student, Department Of Physiotherapy, Sharda School Of Allied Health Sciences, Sharda University, Greater Noida, Utter Pradesh
[2]Professor, Department Of Physiotherapy, Sharda School Of Allied Health Sciences, Sharda University, Greater Noida, Utter Pradesh

Abstract

Background: Theragun therapy and the McKenzie Technique are popular active treatment approaches for managing mechanical low back pain, combining manual techniques and exercises aimed at symptom reduction and functional improvement.

Aim and Objective: To compare the effectiveness of the McKenzie Technique alone versus McKenzie Technique combined with Theragun therapy on pain and range of motion in individuals with mechanical low back pain.

Method: Forty-two participants were randomly allocated into two groups (21 each). Group A received McKenzie Technique alone, and Group B received McKenzie Technique combined with Theragun therapy for 15 sessions over 3 weeks. Pain and functional measures were assessed pre- and post-treatment.

Results: Both groups demonstrated significant improvements in pain, muscle strength, and lumbar mobility. However, Group B, which received Theragun therapy, showed superior outcomes compared to Group A.

Conclusion: A 3-week intervention using the McKenzie Technique combined with Theragun therapy was more effective than the McKenzie Technique alone in reducing pain and improving function in individuals with mechanical low back pain.

Keywords: Mechanical Low Back Pain, McKenzie Technique, Theragun Therapy, Range of Motion, Pain Management.

INTRODUCTION

Mechanical or nonspecific low back pain is more common. One's own spine, intervertebral disks, or surrounding soft tissues might be the source of mechanical low back discomfort. The identification of non-mechanical low back pain patients and the need for further assessment or imaging can be aided by clinical cues, sometimes known as red flags. Newly developed urine retention or overflow incontinence, a history of malignancy, a recent invasive spinal treatment, and a history of substantial trauma relative to

age are all considered red signs. Imaging should be saved for cases when there is a possibility of infection, fracture, malignancy, or cauda equina syndrome at the time of presentation. Magnetic resonance imaging is a more effective method for determining the origin of soft tissue or neurologic abnormalities in the lumbar spine, whereas plain radiography is suitable for evaluating fracture and bony abnormality.

Mechanical low back pain can be treated in a variety of ways, but there is frequently insufficient proof of its effectiveness. The short-term treatment of mechanical low back pain with opioids, non-steroidal anti-inflammatory medications, and to primate is supported by moderate evidence. For the treatment of persistent low back pain, acetaminophen, transcutaneous electrical nerve stimulation, skeletal muscle relaxants, antidepressants (apart from duloxetine), and lidocaine patches have little to no evidence of effectiveness. Physiotherapy is well-supported in the short term and has moderately good evidence in the long run for treating Mechanical low back pain.

The purpose of this introduction is to give a general overview of the McKenzie Method and how it is used to treat LBP. We will examine the fundamental ideas of this strategy, the data demonstrating its efficacy, and the real-world applications for patients and healthcare providers. Healthcare professionals may more effectively customize their treatment plans and enable patients to attain long-term relief from LBP while reducing dependency on passive therapies by being aware of the basic ideas behind the McKenzie Method. Theragun has proved as the fascia releasing tool in the past researches, they hypothesize that Theragun have reduced the muscle fatigue and increases range of motion of muscle. Theragun have potential for early muscle recovery.

MATERIALS AND METHODS

Study design: Quasi experimental study.
Study Design: quasi experimental design
Study Setting: Sharda Hospital, Physiotherapy Department.
Study Subjects: Individuals with mechanical low back pain
Study Duration: 6 months
Sampling method: chit method
Sample size: A Total of 42 subjects with mechanical low back pain diagnosed by an orthopaedician were screened for eligibility, out of these 42 subjects both men and women who were willing to participate in the study were included in this study, all the recruited participants were explained about the purpose study and relevance of the study. After obtaining informed consent form and meeting the inclusion criteria, all the eligible participants were randomized into two groups with 21 subjects in McKenzie technique group and 21 subjects in McKenzie technique along with theragun group.

Sr. NO	Groups	No of subjects	Treatment
1	Group A	21	McKenzie technique
2	Group B	21	McKenzie technique + Theragun therapy

Materials used:

1. Examination couch (plinth)

2. Theragun machine
3. Inch tape
4. (VAS) Visual Analog Scale (sheet)
5. Roland Morris Disability Questionnaire (sheet)
6. Pen.

Criteria for sample selection

Inclusion criteria

Age range, 20 to 45 years old.
Gender both male and females.
Pain lasting less than 6 weeks.
Individuals with mechanical low back pain.

Exclusion criteria

Previous or scheduled back surgery
Malignancy.
Trauma.
Use of certain medications like analgesics, muscle relaxants and anti-epileptic drugs.
Inflammatory diseases.
Pregnancy.
Any other ongoing treatment.

Study Tools and Outcome measures

Visual Analogue scale (Vas): This tool was used to measure the pain intensity was measured at baseline (pre -test) and at the conclusion of the third week (post-test) using the visual analogue scale (VAS). In a visual analog scale, a horizontal line of 100 millimeters or 10 cm is usually used. The lines with the words "NO PAIN" on the left and "WORST PAIN" on the right are displayed. Patients were asked to indicate how uncomfortable they were during the examination over the phone. The patient's mark is then calculated by subtracting the left end, which denotes "no pain." The VAS score is a measure of the patient's level of pain.

Roland-Morris Low Back Pain and Disability Questionnaire: To evaluate functional impairment in people with low back pain, the Roland-Morris Low Back Pain and impairment Questionnaire (RMDQ) is a popular self-reported outcome measure. The 24 statements in the RMDQ address how back pain affects routine tasks including walking, bending, sitting, and taking care of oneself. On assessment day, patients are asked to tick the statements that pertain to them; each check earns one point. With a total score ranging from 0 (no impairment) to 24 (highest disability), the patient's perceived functional restriction as a result of low back pain may be simply but effectively quantified. It is an effective tool for tracking patient development over time and assessing treatment results because of the RMDQ questions. Measured at baseline (pre -test) and at the conclusion of the third week (post-test).

Manual Muscle Testing (MMT): Manual muscle testing, or MMT, is a basic clinical technique for determining muscle strength. Muscle strength is ranked from 0 to 5 on a standardized scale: Grades are as follows: Grade 0 (no contraction), Grade 1 (no movement, Trace contraction), Grade 2 (poor range of motion in a position where gravity is eliminated), Grade 3 (fair—full range of motion against gravity, no resistance), Grade 4 (good—full range of motion against moderate resistance), and Grade 5 (normal—

free range of motion against maximum resistance). Measured at baseline (pre -test) and at the conclusion of the third week (post-test).

The Modified Schober Test(MST): The Modified Schober Test is a simple and reliable clinical assessment used to measure the flexibility and range of motion of the lumbar spine. The posterior superior iliac spines (PSIS) are marked, followed by a line drawn between them, and then more lines made 5 cm below and 10 cm above that line. A new measurement of the distance between the upper and lower markings is taken when the patient bends forward. When the distance between the two markings increases by less than 5 cm, the test is considered positive and indicates limited lumbar flexion. Measured at baseline (pre -test) and at the conclusion of the third week (post-test).

Intervention:

This is a 3 week study which includes McKenzie technique for Group A and McKenzie technique along with theragun group for Group B along with conventional therapy to both the groups, The outcomes were measured by Visual Analogue scale (VAS) and Roland-Morris Low Back Pain and Disability Questionnaire (RMDQ) for pain and function, Manual Muscle Testing (MMT) for muscle strength, The Modified Schober Test(MST) for Range of motion All the subjects who were eligible for the criteria were randomly allocated in to Group A and Group B.

Group A

McKenzie technique

Procedure

Duration: 3 weeks (15 sessions – 5 sessions / week)

1st week – Modified lateral glide with assistance

- Patient has to lean towards the door by grabbing the door support with the foot 10 cm apart and then with assistance then the patient has to perform the lateral flection to the spine level.

2nd week –Prone McKenzie techniques

- **Level 1:** Prone Lying on your stomach with arms by your side trying to left the head from the couch while maintaining the hips and legs on the table.
- **Level 2:** Prone Lying on your stomach Resting on your forearms with elbows under your shoulders while lying on your stomach and trying to left the head presses their shoulders up toward the ceiling as if they are ready to perform a push-up to their maximum level
- **Level 3:** Prone Lying on your stomach resting on your forearms with elbows under your shoulders while lying on your stomach and trying to left the head and shoulder presses their shoulders up toward the ceiling till the chest eliminates the contact from the couch. The goal is to reach full end range of extension

3rd week – Prone Rotations

- After all the expectations met prone rotations will be performed.

Fig. 1: Modified lateral glide with assistance

Fig. 2: Prone McKenzie techniques (LEVEL 1)

Fig. 3: Prone McKenzie techniques (LEVEL 2)

Fig. 4: Prone McKenzie techniques (LEVEL 3)

Group B

McKenzie technique along with theragun

Procedure

Duration: 10 minutes per session 3 weeks (15 sessions – 5 sessions / week)

- 1st week – Modified lateral glide with assistance
- Patient has to lean towards the door by grabbing the door support with the foot 10 cm apart and then with assistance then the patient has to perform the lateral flection to the spine level. Then the assessing for the stiffness by palpating and fell at spinous level and musculoskeletal level then the application of theragun will be given and recheck with the same technique
- 2nd week –Prone McKenzie techniques
- Level 1: Prone Lying on your stomach with arms by your side trying to left the head from the couch while maintaining the hips and legs on the table.
- Level 2: Prone Lying on your stomach Resting on your forearms with elbows under your shoulders while lying on your stomach and trying to left the head presses their shoulders up toward the ceiling as if they are ready to perform a push-up to their maximum level
- Level 3: Prone Lying on your stomach Resting on your forearms with elbows under your shoulders while lying on your stomach and trying to left the head and shoulder presses their shoulders up toward the ceiling till the chest eliminates the contact from the couch. The goal is to reach full end range of extension
- Assessment of stiffness will be done by palpation during the procedure then the application of theragun will be given and re assessing will be done at spinous level and musculoskeletal level
- 3rd week – Prone Rotations

- After all the expectations met prone rotations will performed and the Assessment of stiffness will be done by palpation during the procedure then the application of theragun will be given and re assessing will be done at spinous level and musculoskeletal level
- The frequency range is between 1750 to 2400 percussions per minute (PPM) and the amplitude of 16mm
- Intensity: 1st week – level 1 and 2
  2nd week – level 3 and 4
  3rd week – level 5 and 6.

Fig. 5: McKenzie technique along with Theragun therapy

RESULTS AND DISCUSSION

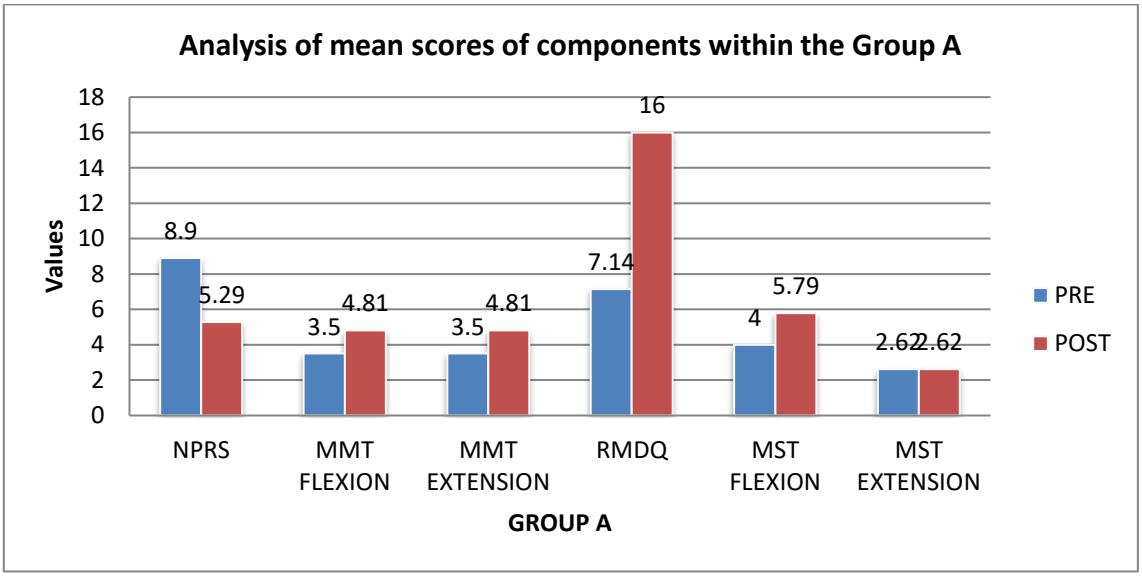
Results

Analysis of mean scores of components within the Group A

Table 1

Group A	Mean	SD	P Value	Inference

NPRS	PRE	8.83	0.37	0.568	Insignificant
	POST	6.31	0.46		
MMT FLEXION	PRE	3.50	0.00	0.001	Highly Significant
	POST	4.14	0.28		
MMT EXTENSION	PRE	3.50	0.00	0.001	Highly Significant
	POST	4.12	0.31		
RMDQ	PRE	7.00	0.71	0.508	Insignificant
	POST	12.00	1.14		
MST FLEXION	PRE	4.00	0.47	0.001	Highly Significant
	POST	4.90	0.58		
MST EXTENSION	PRE	2.48	0.11	0.109	Highly Significant
	POST	2.98	0.11		

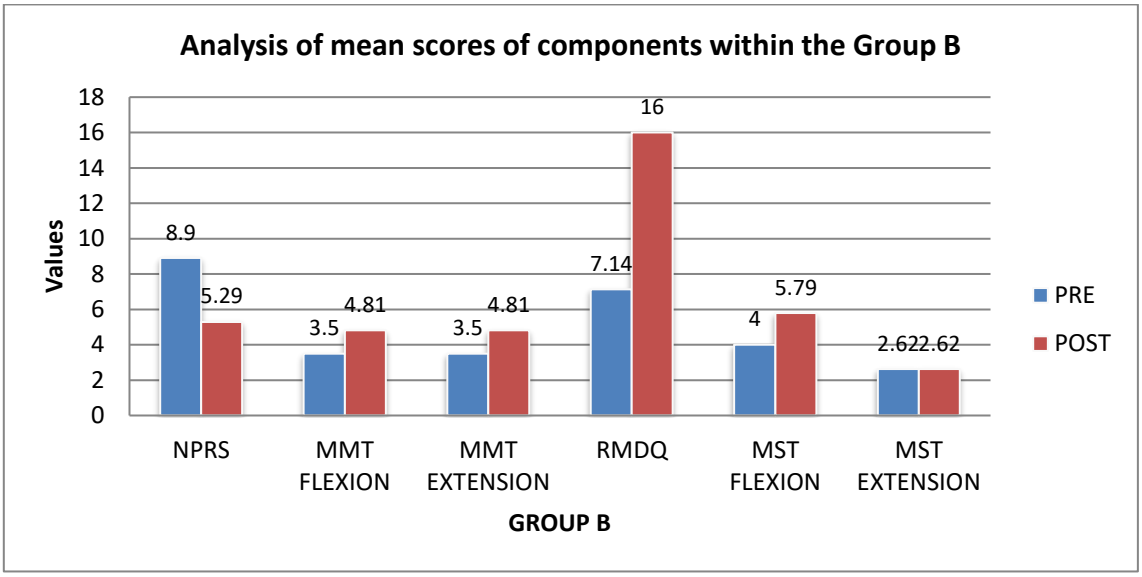


Result: The above table and graph shows that the mean score of Group A changes from pre-test to post-test values within Group A were found to be statistically highly significant($p<0.005$).But the NPRS and RMDQ which were found to be statistically insignificant

Analysis of mean scores of components within the Group B Table 2

Group B	**MEAN**	**SD**	**p-value**	**Inference**
NPRS PRE	8.9	0.44	0.001	Highly Significant
NPRS POST	5.29	0.56		
MMT FLEXION PRE	3.5	0.00	0.001	Highly Significant
MMT FLEXION POST	4.81	0.40		
MMT EXTENSION PRE	3.5	0.00	0.001	Highly Significant
MMT EXTENSION POST	4.81	0.40		

RMDQ PRE	7.14	0.65	0.001	Highly Significant
RMDQ POST	16	1.05		
MST PRE FLEXION	4	0.45	0.001	Highly Significant
MST POST FLEXION	5.79	0.51		
MST PRE EXTENSION	2.62	0.38	0.5008	Insignificant
MST POST EXTENSION	2.62	0.38		



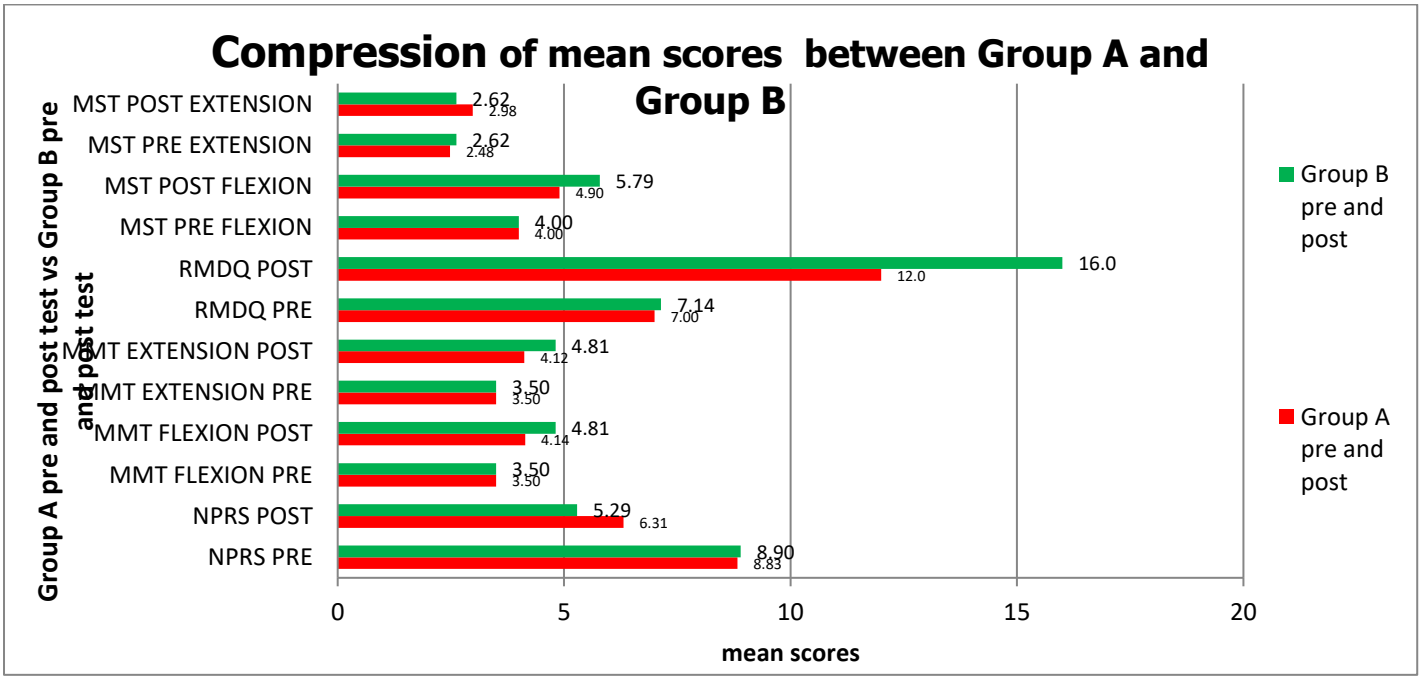
Result:

The above table and graph shows that the mean score of Group B changes from pre-test to post- test values within Group B were found to be statistically highly significant($p<0.005$).But the MMT Extension which were found to be statistically insignificant.

Compression of mean scores between Group A and Group B Table 3

Metric	Group A (Mean)	Group B (Mean)	p-value	Inference
NPRS PRE	8.83	8.90	0.569	Insignificant
NPRS POST	6.31	5.29		
MMT FLEXION PRE	3.50	3.50	0.001	Highly Significant
MMT FLEXION POST	4.14	4.81		
MMT EXTENSION PRE	3.50	3.50	0.001	Highly Significant
MMT EXTENSION POST	4.12	4.81		
RMDQ PRE	7.00	7.14	0.501	Insignificant
RMDQ POST	12.0	16.0		
MST PRE FLEXION	4.00	4.00	0.001	Highly

MST POST FLEXION	4.90	5.79		Significant
MST PRE EXTENSION	2.48	2.62	0.001	Highly Significant
MST POST EXTENSION	2.98	2.62		



Result: The above table and graph shows the mean score of NPRS changes between the Group A post-test is 6.31 and Group -B post-test is 5.29 were Group B Has found to be statistically highly significant.

DISCUSSION

The aim of the study was to compare the effectiveness of McKenzie technique with and without Theragun on pain and range of motion in individuals with mechanical low back pain. McKenzie technique and Theragun therapy are the techniques used in physical therapy practice but Theragun therapy is an emerging intervention multiple studies suggest that treating mechanical low back pain can decrease pain and improve function but there were limited studies on exploring the effects and comparison between McKenzie technique and McKenzie technique along with Theragun therapy on pain reduction and functional improvement in subjects mechanical low back pain.

The provided data presents statistical summaries for two groups (A and B) across various metrics before and after an intervention, such as NPRS (Numerical Pain Rating Scale), MMT (Manual Muscle Testing) for flexion and extension, and RMDQ (Roland-Morris Disability Questionnaire). Group A (Age) Mean = 26.48 years (NPRS PRE) Mean = 8.83 (indicating high pain levels) (NPRS POST)Mean = 6.31 (indicating improvement) MMT Flexion & Extension PRE/POST Mean values suggest slight improvements post-intervention in flexion from 3.50 to 4.14 and in extension from 3.50 to 4.12. RMDQ PRE/POST: Mean = 7.00 to 12.00 indicates a decrease in disability. MST Flexion & Extension PRE/POST: A reduction in reported scores suggests improvement in functional movements.

Group B (Age) Mean = 25.62 years- NPRS PRE: Mean = 8.90- NPRS POST: Mean = 5.29 (indicating a

greater improvement in pain compared to Group (A) MMT Flexion & Extension PRE/POST: Improvements similar to Group A, with flexion from 3.50 to 4.81 and extension from 3.50 to 4.81. RMDQ PRE/POST: Indicates disability decreased slightly. MST Flexion & Extension PRE/POST: Improvements noted indicating better functional capabilities. Both groups show improvements across the measured outcomes, but there is a more significant decrease in pain levels reported in Group B when comparing NPRS scores post-intervention. While there were observable improvements in both groups in terms of muscle strength and disability (as indicated by the RMDQ), But when compared between Group A and Group B (RMDQ) Group b has been more statically significant than Group A.

CONCLUSION

The findings of the study concluded that, a 3 week intervention of both McKenzie technique and McKenzie technique along with theragun therapy active release technique have shown to be statistically significant in reducing pain and improving the function in subjects with Mechanical low back pain. However McKenzie technique along with theragun therapy was more effective when compared with McKenzie technique.

ACKNOWLEDGEMENT

It is with a sense of pride and pleasure when I look back to acknowledge those who have been a source of encouragement in my entire endeavor.

1. National Institute of Neurological Disorders and Stroke. Low Back Pain Fact Sheet. 2015 Nov 3 [Internet]. Available from: https://www.ninds.nih.gov
2. Koes BW, van Tulder M, Lin CW, Macedo LG, McAuley J, Maher C. An updated overview of clinical guidelines for the management of non-specific low back pain in primary care. Eur Spine J. 2010 Dec;19(12):2075-94. doi:10.1007/s00586-010-1502-y.
3. Manusov EG. Evaluation and diagnosis of low back pain. Prim Care. 2012 Sep;39(3):471-9. doi:10.1016/j.pop.2012.06.003.
4. Casazza BA. Diagnosis and treatment of acute low back pain. Am Fam Physician. 2012 Feb 15;85(4):343-50.
5. National Institute of Neurological Disorders and Stroke. National Institute of Health [Internet]. Archived from the original on 19 July 2013 [cited 2013 Jul 12]. Available from: https://www.ninds.nih.gov
6. National Institute of Arthritis and Musculoskeletal and Skin Diseases. Fast Facts About Back Pain. NIH; 2009 Sep.
7. Seju Y, Rajput V. Efficacy of Theragun and Surge Faradic Stimulation in Subjects with Trapezitis: A Randomized Controlled Trial.
8. Heggannavar AB, Kulkarni PK, Naik KK, Oza AN. Compare the Effect of 50% Ramp-Up and 100% Ramp-Up Faradic Stimulation in Patients with Non-Specific Trapezius Spasm: A Randomised Clinical Trial.
9. Patel R, Patel A. Effect of Theragun on the improvement of back flexibility: A case study.
10. Chaudhary ES, Shah N, Vyas N, Khuman R, Chavda D, Nambi G. Comparative study of myofascial release and cold pack in upper trapezius spasm.
11. Zunzunwala S, Phansopkar P, Lakhwani M. Effect of Theragun on calf muscle tightness in asymptomatic individuals.

12. Alvarado F, Valenzuela K, Finn A, Avila EB, Crussemeyer JA, Nakajima M. Effects of Percussion Therapy (Theragun™) on Range of Motion and Athletic Performance.
13. Patel GR, Vedawala N. Effectiveness of myofascial release with fascial gun in myofascial pain dysfunction syndrome: A quasi-experimental study.
14. Ćosić M, Baša N, Stojiljković S, Prebeg G. Theragun as a recovery tool in recreational exercise.
15. Tyagi H, Sharma R. Impact of cupping therapy and percussive therapy in fibromyalgia patient: A case report.