Efficacy of hamstring stretching with core stabilization Vs myofascial release with k-tapping in case of sciatica

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***Abstract*—Purpose: sciatica represents a common worldwide condition that often impacts on general life and leads to several adverse health consequences, such as trouble walking, working, sleeping, and regulating mood. Accordingly, this study aimed to determine the impact of hamstring stretching with core stabilization versus kinesio tape (KT) and myofascial release (MFR) on sciatica.**

Material & Methods: Seventy patients suffering from sciatica pain participated in this trial. They were aged between 20 and 45 years, were 8-10 weeks sciatica pain. Participants were randomly assigned to two equal groups, each comprising 15 person. Group-A received hamstring stretching and core stabilization treatment regularly for 15 days, while Group B underwent MFR with K-tapping sessions daily for 15 days. Pre- and post-treatment evaluations were conducted for both groups, measuring pain intensity using the Visual Analogue Scale (VAS) and functional outcomes using Oswestry Disability Index(ODI).

Results: Both groups indicated statistically significant improvements ($P<0.05$) in pain and functional disability in all directions post-treatment. Between-group comparisons post-intervention showed that Group A demonstrated statistically significant superiority ($P<0.05$) in pain reduction and functional improvement in all as compared to Group B.

Conclusions: The study demonstrated that both hamstring stretching with core stabilization and kinesio tape (KT) with myofascial release (MFR) on sciatica are effective interventions for reducing pain and improving functional status in person suffering from sciatica pain. However, the significantly superior outcomes achieved with Gp-A across all measured variables suggest it is a more potent method for producing immediate improvements in this specific problem.

***Index Terms*—Kinesio tape, myofascial release, VAS, ODI, low back pain.**

I. INTRODUCTION

Sciatica is a broad term relating to a group of symptoms characterized by pain and sometimes sensori-motor disturbance radi- ating from the lumbar-sacral spine to below the knee.(1) It is often used synonymously with more contemporary terms such as spine- related leg pain, lumbar radicular pain and lumbar radiculopathy. To promote precision and a uniformity, this paper utilizes the word sciatica throughout because it is still the most prevalent word across patients and professionals. Sciatica typically affects the working-age population and usually has a favourable outcome at 12 to 24 months.(2) However, for some people, sciatica can be severely painful and disabling, affecting every aspect of their lives, including capability to work, participate in social activities and carry out activities of daily living. With an annual prevalence of 2.2%, it is a significant health and social care issue worldwide.(3) Low back pain which has been persisting more than 3 months are known as chronic low back pain, and they are multidimensional phenomenon. So that the treatment interventions to cure these problems are also present in multifactorial approach. Advanced interventions to treat lower backache in general and physiotherapy in particular are also happening in lightening fast now days. Many methods of interventions are less efficient, but at the same time manual therapy approaches, targeted muscle training program, higher function intervention like behavioural therapy and multifocal management of pain and discomfort are all having well supported research publications [4]. Sciatica is commonly described as the spine's inability to maintain controlled displacement under physiological loads, which may contribute to pain and disability(5). Expanding on this concept, secondary elements like hip mobility and hamstring strength are receiving more and more consideration, which may influence symptoms and functional outcomes in young adults with sciatica. In particular, impairments in hamstring performance and hip mobility are thought to play an important role in functional limitations and disability, making them relevant clinical targets for investigation(6). In particular, impairments in hamstring performance and hip mobility are thought to play an important role in functional limitations and disability, rendering them pertinent potential therapies for research. The causes of LBP are complex, and manifestations are often linked to disc degenerative conditions and decreased trunk-hip muscle function(7). There has also been discussion of a function defined of the hamstrings in lumbopelvic biomechanics. Tight hamstrings may influence pelvic tilt and lumbar posture, although it remains unclear whether these changes are causal or compensatory. Beyond flexibility, broader hamstring performance, including strength, has been linked to functional outcomes. For example, targeted hamstring exercises have been associated with improvements in balance and stability in individuals with LBP. These observations support examining hamstring strength as a clinically relevant factor in relation to pain and disability(8,9). Regarding the impact of hamstring extensions while preserving pelvic balance on low back pain, discover that pelvic control are more useful in alleviating lower back discomfort(10). hamstring muscle flexibility is significantly decreased in people with nonspecific low back pain, which affects anterior pelvic rotation and forward bending range. Reduced hamstring flexibility can lead to

greater lumbar flexion, which can worsen low back discomfort. While people experiencing sciatica pain have shorter hamstring muscles(11). Taping treatment is one of the most popular physical therapy alternatives for sciatica pain. This technique can either facilitate or restrict muscle movement, depending on the orientation of the underlying muscle fibers. It may also influence motor neuron output by stimulating sensory receptors in the skin (Bae et al., 2013). It is a technique that lifts the skin, thereby reducing pressure on the mechanoreceptors beneath the skin and decreasing pain signals (Maia et al., 2018)..

Myofascial release (MFR) is a hands-on treatment that uses gentle pressure and stretching techniques to relieve fascial restrictions. These restrictions can arise from different causes such as accidents, injuries, chronic stress, overuse, or scars from trauma or surgery (LeBauer et al., 2018). Releasing these restrictions helps reduce anxiety, improve sleep quality, and ease depression. It is seen as a complementary therapy for individuals with LBP. MFR has been shown to improve pain management and overall quality of life for patients with fibromyalgia (Balasuburamaniam, 2014). Various studies were published to understand the technique of releasing myofascia (MFR) has been an important physiotherapy technique in the treatment of painful conditions and it brought effective output in terms of muscle stiffness. It has been taught in wide range and carried out by physiotherapists throughout the world. It was very useful in the treatment of sciatica pain(12). Core stability refers to the body region bounded by the abdominal wall, pelvis, lower back and the diaphragm and its ability to stabilize the body during movement. The primary muscles involved are the transverse abdominal, internal and external obliques, quadratus lumborum and diaphragm. The diaphragm is the main breathing muscle in human breath and hence is important in providing stability of the base required for moving and lifting. It is the action of these muscles that contract together on the incompressible contents of the abdominal cavity (ie, internal organs or viscera) that provides support to the spine and pelvis during the movement (13). Core stabilization exercises are specifically designed to enhance the strength, endurance, and coordination of the deep trunk muscles responsible for maintaining spinal control during dynamic activities. These exercises, when performed systematically, aim to reestablish the neuromuscular activation patterns that are often disrupted in patients with CLBP sciatica. By retraining the timing and precision of muscle contractions, core stabilization programs restore balance between local stabilizers and global mobilizers, thereby improving postural control, load distribution, and overall movement efficiency. Moreover, evidence from clinical practice suggests that patients who adhere to core-focused rehabilitation demonstrate not only improved pain reduction but also superior gains in flexibility, stability, and functional independence compared with those undergoing conventional exercise therapy(7).

II. METHODOLOGY

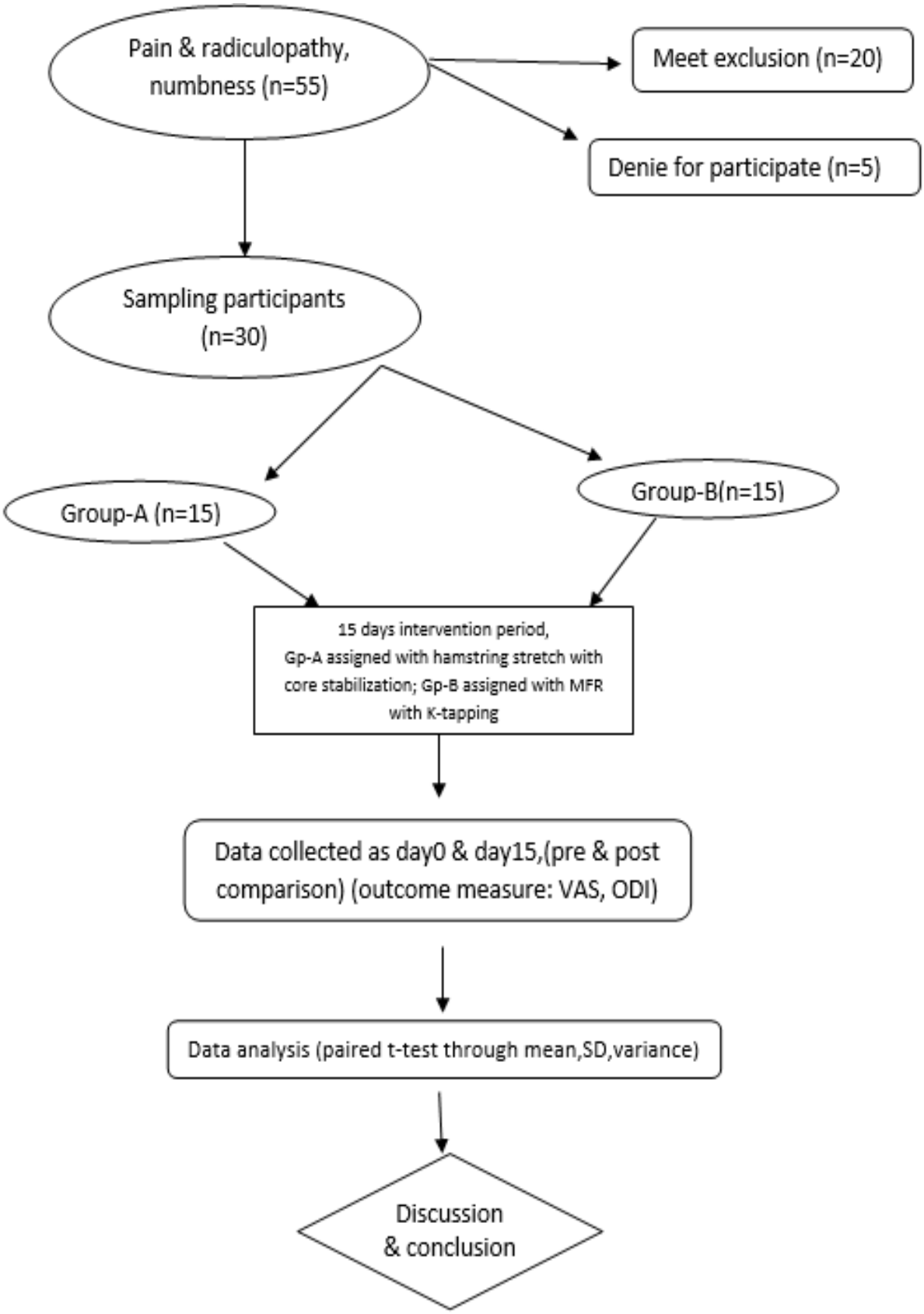
The single-blinded randomized controlled trial study was conducted at ANS Hospital from February to November 2025. The study was conducted at the physical therapy department of

ANS Hospital (Jaipur). The ethical approval was obtained from the Research and Ethical Committee of the hospital. Male and female subjects between the ages of 25- 50 years, with >3 months history of mild to moderate back pain having hamstring shortening, SLR less than 60^{O}, VAS > 5 and (ODI) score between 20% to 40% were enrolled in the study. Patients with osteoarthritis or spondylolisthesis, systemic disease, disc herniation or leg length discrepancy, pregnant females, and participants with back pathology or excessive lumber lordosis were excluded.

The JASP software was used to determine the sample size. The effect size (Cohen's d=0.92) obtained from a prior study was used to calculate the sample size of n=30. During the calculation, the power (1-β) was 85% and the alpha level was kept at 0.05 to achieve the sample size.

The non-probability convenience sampling technique was used for sample selection. A total of n=55 subjects were evaluated for eligibility criteria. Out of which n=20 patients were excluded due to not meeting the selection criteria (n=35) and declining to participate (n=5) in the study. From n=30 participants equally allocated to Group A (n=15) receiving hamstring stretching with core stabilization and Group B (n=15) receiving myofascial releasing with K-tapping method. From both groups with research protocols, a total of n=30 participants completed the study and were included in the data analysis. (Figure 1)

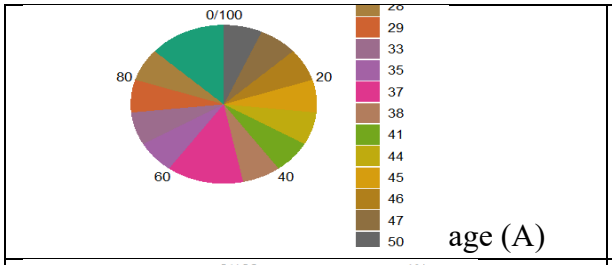
The randomization was done through the cheat sheet method. In this method, all participants were arrange with cheats and pick up the cheats one by one arbitrarily and placed the patients as group-A and group-B. This method was used repeatedly to assign participants to their respective groups. The patients were blinded in the study and unaware of the group being allocated. Both groups received a hot pack for 15 min before starting the treatment protocol over the lumber area in prone lying. Group A received hamstring stretching with core stabilization maintained for 20 mins, however on supine lying hamstring stretching performed as 30sec hold with 15 repetitive cycles and core stabilization exercise were performed for 10mins. Group B performed myofascial releasing techniques for 15min, however hold and relax cycle performed as 30 sec hold with 10 sec relax as each cycle, after MFR, kinesio tape used as thigh to lumbar complex region for stabilization. The pain intensity was measured by VAS which consists of 10 cm horizontal line representing 1 end with “no pain at all” and the other end with “as bad as possible it could be.” Each subject was asked to enter in the line as per his pain perception and the score is measured by the distance on the line. The reliability and validity of VAS in application of musculoskeletal conditions was good(16). The Oswestry Disability Index was used to measure pain-related disability in persons with low back discomfort, It contains a total of 10 items, and each item is scored from 0 to 5. The overall score is calculated by multiplying the sum of the scores by 2, giving a scale of 0 to 100(15).


Pain & radiculopathy, numbness (n=55)
Meet exclusion (n=20)
Denie for participate (n=5)
Sampling participants (n=30)
Group-A (n=15)
Group-B(n=15)
15 days intervention period, Gp-A assigned with hamstring stretch with core stabilization; Gp-B assigned with MFR with K-tapping
Data collected as day0 & day15,(pre & post comparison) (outcome measure: VAS, ODI)
Data analysis (paired t-test through mean,SD,variance)
Discussion & conclusion

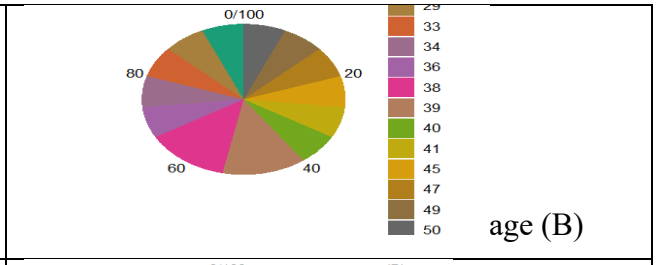
Results:
Descriptive Statistics

	age (A)	age (B)	sex (A)	sex (B)	VAS day0(A)	VAS day0(B)	VAS day15(A)	VAS day15(B)	ODI day0(A)	ODI day0(B)	ODI day15(A)	ODI day15(B)
Valid	15	15	15	15	15	15	15	15	15	15	15	15
Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean	37.467	38.933			6.933	6.600	3.200	3.400	49.867	48.467	22.733	24.200
Std. Deviation	7.945	6.902			1.100	0.986	0.862	0.910	5.579	3.642	2.282	4.127
Minimum	26.000	26.000			5.000	5.000	2.000	2.000	43.000	43.000	20.000	20.000
Maximum	50.000	50.000			8.000	8.000	4.000	5.000	58.000	56.000	27.000	33.000

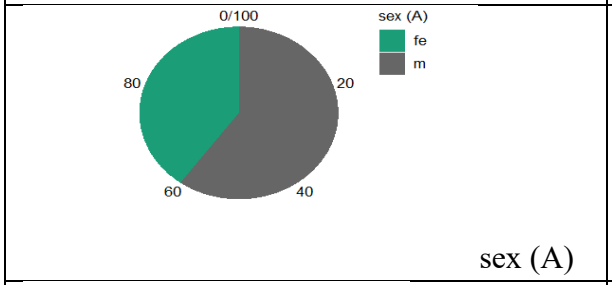
Pie charts



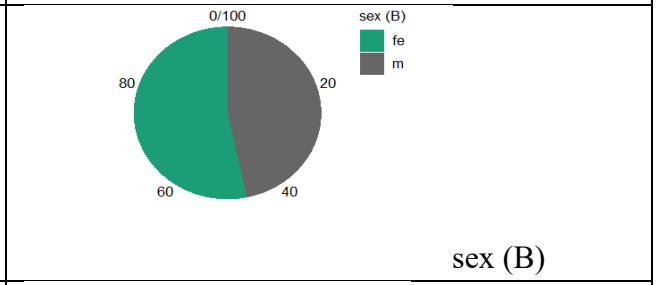
age (A)



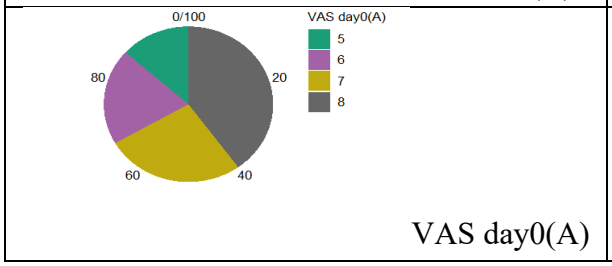
age (B)



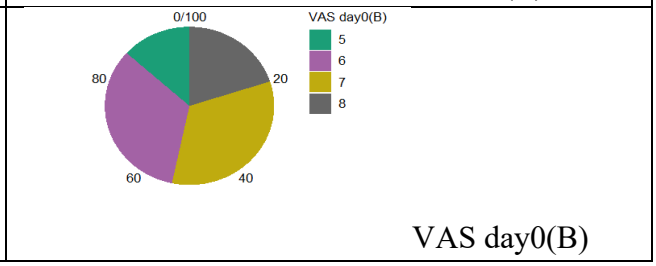
sex (A)



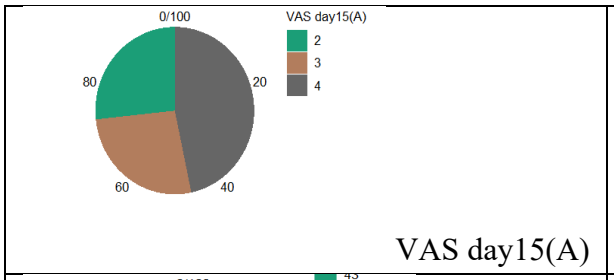
sex (B)



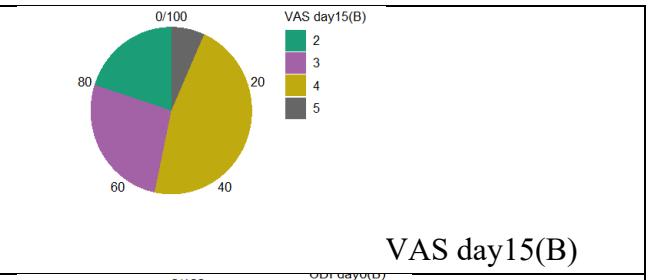
VAS day0(A)



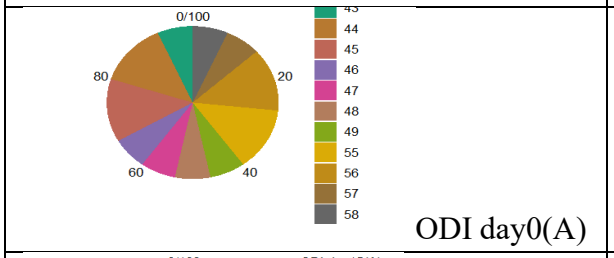
VAS day0(B)



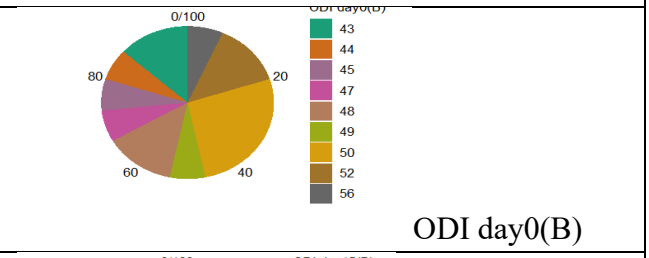
VAS day15(A)



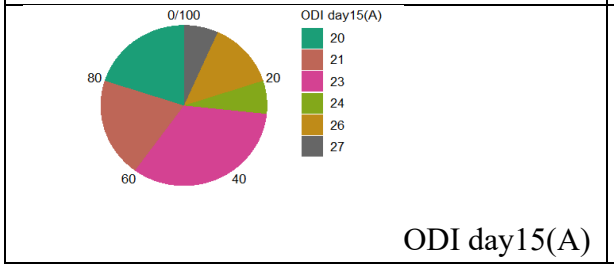
VAS day15(B)



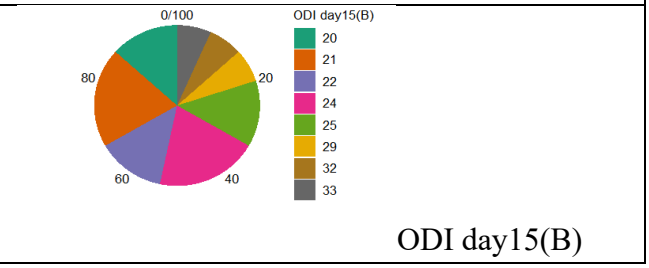
ODI day0(A)



ODI day0(B)



ODI day15(A)



ODI day15(B)

Paired Samples T-Test												
								95% CI for Mean Difference			95% CI for Cohen's d	
Measure 1		Measure 2	t	df	p	Mean Difference	SE Difference	Lower	Upper	Cohen's d	Lower	Upper
age (A)	-	age (B)	-0.807	14	0.433	-1.467	1.818	-5.365	2.432	-0.208	-0.717	0.307
VAS day0(A)	-	VAS day15(A)	18.101	14	0.0121	3.733	0.206	3.291	4.176	4.674	2.883	6.451
VAS day0(B)	-	VAS day15(B)	29.933	14	0.0237	3.200	0.107	2.971	3.429	7.729	4.851	10.498
VAS day15(A)	-	VAS day15(B)	-0.716	14	0.0386	-0.200	0.279	-0.799	0.399	-0.185	-0.692	0.329
ODI day0(A)	-	ODI day15(A	26.895	14	0.021	27.133	1.009	24.970	29.297	6.944	4.348	9.531

Paired Samples T-Test												
								95% CI for Mean Difference			95% CI for Cohen's d	
Measure 1		Measure 2	t	df	p	Mean Difference	SE Difference	Lower	Upper	Cohen's d	Lower	Upper
		)										
ODI day0(B)	-	ODI day15(B)	22.111	14	0.31	24.267	1.097	21.913	26.621	5.709	3.553	7.853
ODI day15(A)	-	ODI day15(B)	-1.926	14	0.025	-1.467	0.761	-3.100	0.166	-0.497	-1.028	0.048

From the above study the "P" value in VAS scale and ODI scale shows the significant difference i.e $p < 0.05$. hence the procedure-1 placed a better result than procedure-2.

III. DISCUSSION

Hamstring tightness is commonly observed in patients with sciatica due to pain-related muscle guarding, altered posture, and neural mechanosensitivity. Properly applied hamstring stretching can be a useful component of sciatica rehabilitation**,** but it must be done carefully and selectively**.** The reduction in pain intensity among participants who received core stabilization therapy underscored the importance of addressing neuromuscular dysfunction as a central therapeutic target. Pain in chronic low back conditions is not solely a result of tissue damage but also of maladaptive motor behavior and central sensitization. By re-establishing motor control and proprioceptive accuracy, the intervention appeared to modulate both peripheral and central mechanisms of pain. This dual effect can explain the substantial decline in Visual Analogue Scale scores observed after twelve weeks, surpassing the improvements achieved by conventional physiotherapy. In clinical practice, this outcome suggests that rehabilitation efforts focused on muscle coordination and endurance may offer more durable benefits than symptom-oriented interventions alone(17). MFR generally involves exerting constant, persistent pressure (120-300s) on a restricted number of fascial layers, either directly (using the direct MFR method) or indirectly (using the indirect MFR approach). Direct MFR uses knuckles, elbows, or other objects to contact, tension, or stretch the fascia. Indirect MFR requires a slight stretch to liberate movement. The hands follow fascial restrictions, stretch, and release fascia with a few grams of effort. In a prior study, LBP patients had single MFR session, which had no meaningful benefit. This case report uses a particular MFR protocol over a longer period (18). Research on radiculopathy are further supported by recent studies indicating that KT can enhance movement

confidence and reduce kinesiophobia, which is the fear of movement and a significant barrier to recovery in chronic pain conditions (Wlazło et al., 2025).

Hamstring Stretching with Core Stabilization	Myofascial Release Technique with K-Taping
Hamstring stretching: Reduces posterior chain tightness, Improves pelvic mobility and lumbar posture, Decreases neural tension (especially in L5–S1 related sciatica) Core stabilization: Enhances activation of deep stabilizers (Transversus abdominis, Multifidus), Reduces spinal segmental stress, Improves load sharing and movement control	Myofascial Release (MFR): Reduces fascial adhesions, Improves local circulation, Decreases muscle tone and pain sensitivity K-Taping: Provides proprioceptive input, May reduce pain via neurosensory stimulation, Offers short-term postural and muscle support

IV. CONCLUSION

Hamstring stretching combined with core stabilization demonstrates superior efficacy compared to myofascial release with K-taping in patients with sciatica, particularly in improving functional outcomes and providing long-term symptom relief. While myofascial release and K-taping may offer short-term pain reduction, they are best utilized as adjuncts rather than primary interventions in sciatica rehabilitation.

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