Innovations

"A Comparative Study on the Effect of Deep Transverse Friction Massage and Ultrasound in Reducing Pain in Plantar Fasciitis"

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Abstract

Background: *Inflammation of the fascia that covers the plantar area and the tissues around it is known as plantar fasciitis. The main reason for discomfort in the heel, which is found near the base of the foot, is plantar fasciitis. The pain and suffering linked to this illness can significantly affect physical mobility. The cause of this illness is not well known and is likely to be influenced by multiple factors.[1]This is a frequently occurring injury caused by over use.[2]The terms "jogger's heel," "tennis heel," and "policeman's heel" are other names for plantar fasciitis.The measurement is 4 feet and 5 inches. This study seeks to assess the advantages of 2 therapeutic approaches, DTFM and ultrasound method and it would be advantageous to compare their effectiveness in order to determine which technique is more suitable for relieving pain in patients with Plantar fasciitis.* ***Method:*** *This interventional study was conducted on a sample of 30 individuals who met the inclusion criteria for plantar fasciitis. Regarding the condition of plantar fasciitis. This study included 30 individuals who were randomly assigned to two groups. Each group consisted of 15 subjects. Subjects in Group A received Deep transverse friction treatment, Those in the B group were treated with ultrasound. Both groups were evaluated for pain using a VAS. The pretreatment visual analog scale (VAS) score was recorded prior to administering the treatment during all six sessions.The after treatment VAS rating was evaluated after each of the 6 sessions of therapy.* ***Result:*** *In the intergroup analysis, Group A has a mean rank of 8 and a total of ranks (R1) equal to 138.50. On the other hand, Group B has a mean rank of 8 and a sum of ranks (R2) equal to 300. The Mann- Whitney U test yielded a value of 165.0 and a matching value for P equal 0.0015.This P value indicates statistical significance, as it is less than the predetermined threshold of 0.0015. The analysis demonstrates that Group B (Ultrasound) is superior to Group A (Deep transverse friction) in alleviating pain.* ***Conclusion:*** *This study concludes that Ultrasound is more efficacious than DTFM in relieving the pain caused by plantar fasciitis. Both groups had a reduction in pain levels during the treatment session. Specifically, Group B saw a significant reduction in pain immediately following the therapy. Ultrasound is a useful therapy for treating pain in persons with plantar fasciitis.*

Key Terms*: Plantar fasciitis. Deep transverse friction, Ultrasound, Visual Analog Scale (VAS)*

Introduction

The most common cause of heel discomfort is inflammation of the plantar fascia. The agony and unease linked to this ailment can significantly hinder physical mobility. The cause of this illness is not well known and is likely to be influenced by multiple factors.[1] This injury is frequently caused by excessive use. Plantar fasciopathy is a condition caused by repeated damage to the plantar fascia, which starts at its starting point on the median tubercle located in the calcaneus.[3] The terms "jogger's heel," "tennis heel," and "policeman's heel" are other names for plantar fasciitis.Plantar fasciitis accounts for around 11 to 15% of all foot conditions in adults that require expert medical intervention.The illness manifests in populations characterized by a lack of physical activity, affecting approximately 7% of people.[7]The reported occurrence of this condition is highest among individuals aged 40 to 60 in the general population, and among younger individuals who engage in running. The prevalence of the illness differs among studies in relation to gender.[6]Plantar fasciitis is a condition characterized by the thickening of a fibrous tissue called aponeurosis. The longitudinal arch of the foot is formed by this tissue, which starts at the medial tubercle of the calcaneus and expands forward.The plantar fascia provides static support to the longitudinal arch and also functions to absorb shock dynamically.[8] The plantar fascia has two primary purposes: providing support for the longitudinal arch and functioning as a dynamic shock absorber for the foot and leg.[9,10,11,12]Plantar fasciitis is commonly attributed to biomechanical issues, including excessive pronation, according to the literature. Forefoot varus, a type of structural deformity, can lead to an excessive inward rolling of the foot during walking. Overpronation leads to excessive movement of the foot, which can result in higher levels of tension on the muscles, fascia, and soft tissues, causing elongation and greater stress on the tissues[13] The etiology of plantar fasciitis is attributed to the repetitive application of tensile and compressional forces on the foot's arch, leading to a cyclic process of fascial tearing and subsequent repair. This leads to the secretion of chemical mediators that trigger inflammation and result in the sensation of pain. Ultimately, the fascia undergoes degradation and experiences a decline in strength. This results in the tearing of the fascia, which leads to the development of painful scar tissue and the hardening of the fascia through the process of calcification. Additionally, there is a possibility of the formation of a spur.[13,14] The risk factors linked to the development of plantar fasciitis can be classified into three primary categories: Factors related to the structure and function of the body, the mechanics of movement, and the surrounding conditions. The anatomical factors encompass pes planus&cavus, obesity, LLD, and a shortened Achilles tendon. The biomechanical variables encompass equinus, diminished plantar flexor muscles, weakened foot muscles, excessive pronation of the subtalar joint, inadequate footwear, and restricted ankle dorsiflexion. The environmental causes encompass trauma, deconditioning, hard surfaces, prolonged weight bearing, and insufficient stretching. Ankle dorsiflexion restriction has been identified as the primary autonomous risk factor. This constraint can lead to excessive pronation of the subtalar joint, resulting in an enhanced tensile pressure on the plantar aponeurosis.[4,5,6,14] Plantar fasciitis is more common in individuals with high BMI, making them almost twice as likely to develop it. Additionally, individuals with less than 10° of ankle dorsiflexion have at least triple the risk, and those who have a history of prolonged standing have a 3.6 times higher risk.[15, 16, 17, 18, 19.]

Plantar fasciitis, also referred to as heel spur syndrome, is characterized by discomfort that is mostly localized at the site where the plantar aponeurosis connects. The plantar fascia forms a longitudinal arch that supports the foot by extending through the medial tubercle towards the metatarsal heads. Plantar fasciitis is an ailment that can result from overstretching or applying too much pressure to this aponeurosis.[3,5,13,]The most typical symptom of plantar fasciitis is discomfort on the plantar area of the

foot, especially in the heel's inferior side. The patient has exacerbated pain upon initiating ambulation in the morning or following an extended time of abstaining from weight-bearing activities. Following a few steps and during the day, the discomfort in the heel diminishes, but resurfaces during vigorous or prolonged weight-bearing activity. Initially, heel pain may be dispersed or shift, but with the time it localized at the medial calcaneal tuberosity. Discomfort is usually most evident during activities that involve supporting one's own body weight.[21] Patients gives a history that before their symptoms started, they increase in the length or intensity of their regular walking or jogging, changed the shoes, or exercised on a hard surface. One may witness limited ankle movement in the upward direction due to stress in the Achilles tendon.[6, 14, 21,22]The patient's past medical conditions and clinical presentation are the primary factors that determine the final diagnosis of plantar fasciitis.[23] In ordinary clinical practice, imaging has a limited role. However, in certain circumstances, such as those involving persons who have both plantar fasciitis and a calcaneal stress fracture, it can be helpful in ruling out alternative causes of heel pain or validating a diagnosis of plantar fasciitis in situations where it is unclear.Bone scans are helpful when conventional radiographs show normal results. . Ultrasonography has diagnostic value, however it is not frequently used as a standard practice. There will be an increase in plantar fascia thickness, which is measurable.[6]A proactive method for addressing plantar fasciitis should be swiftly adopted, utilizing a comprehensive approach that focuses on the underlying reasons of the condition. The treatment will be classified into pharmaceutical, physical therapy, and surgical methods.[14,24] The medical treatment entails the dispensation of anti-inflammatory drugs. Possible treatments for plantar fasciitis encompass the utilization of anti-inflammatory drugs like NSAIDs and cortisone injections. These therapies have proven efficacy in pain management and inflammation reduction.[8] Due to the inherent risks and potential effects, corticosteroid injections are not the recommended initial therapeutic approach.[13] Various physiotherapy treatment modalities, such as Iontophoresis, Ice, and Ultrasound, have previously been suggested for the management of plantar fasciitis. Iontophoresis is the process of using a low voltage galvanic current to let topical corticosteroids penetrate soft tissue structures.[8] The application of ice is achieved through ice massage, ice bath, or ice pack. Stretching is a widely preferred approach for addressing foot issues, and strengthening the intrinsic muscles of the foot is also a frequently selected therapy option. Stretching and strengthening routines are essential in the management of plantar fasciitis and can target functional risk factors, such as tightness in the gastrocnemius-soleus complex and weakness in the intrinsic foot muscles. Stretching entails the elongation of the gastrocnemius, soleus, and plantar fascia.[14,24]

A seated stretch is the main technique used to extend the Achilles tendon, while rolling is an effective way to stretch the plantar fascia. These stretching exercises can be done using either passive stretching or self-stretching methods.[14,24] The objective of the strengthening exercises is to augment the potency of the intrinsic muscles of the foot. The exercises are classified into non-weight bearing exercises and weight bearing activities. The non-weight bearing exercises include executing the complete alphabet in mid-air with pointed toes, consolidating all five toes, gripping small objects like marbles with the toes and placing them in a container, and twisting the ankle in both clockwise and counterclockwise directions. Weight-bearing exercises include actions like grasping a towel and squeezing a step.[8] Ultrasound is an electrotherapy technique used to alleviate pain caused by plantar fasciitis. Ultrasound is a form of sound wave that exhibits a high affinity for tendons and ligaments, which are distinguished by their organized arrangement and low moisture content. Ultrasound possesses the ability to enhance chemical activity within tissues, increase the permeability of cell membranes, alter molecular structures, and impact the rates of diffusion and protein synthesis. These

impacts can potentially influence the rate of tissue regeneration.[10]HanaHronkova conducted a study where a group of persons with plantar fasciitis were given ultrasound treatment, leading to a significant reduction in pain.[23,24] Electrical modalities are quite advantageous in the treatment of disease caused by chronic overuse soft tissue conditions. Friction massage is notably effective among these methods. The technique of Deep transverse massage was initially pioneered by Minnell in the 1940s and later became known as Cyriax. The clinical literature discusses the use of deep massage and manipulation.[25] Deep friction massage is an essential technique employed to mobilize the superficial tissue located above the underlying structure, hence improving its mobility. Deep transverse friction is a specific type of massage that focuses on the connective tissue. It was developed by Cyriax in 1941 through empirical methods. Massage improves the circulation of blood and lymphatic fluid. Their enlargement is caused by the mechanical actions utilized throughout the massage. Improved blood flow not only aids in transporting nutrients to target cells, but also enhances the body's capacity to efficiently eliminate toxins. Massage improves both the flexibility of joints and the overall mobility of the body. Friction strokes are quite effective in breaking down adhesions. Decreasing these adhesions helps to restore tissue expansion, which in turn stimulates traumatic hyperemia, or an increased local blood flow to the injured tissue.[26]According to the gait hypothesis of pain, friction massage has a captivating effect on anesthetic. By activating the large fiber mechanoreceptors, it triggers presynaptic inhibition in the spinal cord, which blocks the slower small diameter fibers from reaching conscious awareness. Furthermore, there exists a possibility for pain suppression via central neurotransmitters. Anesthesia typically begins within three minutes of friction. A well-documented chemical phenomenon states that the use of targeted lateral friction quickly relieves pain.During the friction, the patient experiences a numbing feeling. Following the session, an evaluation shows a reduction in discomfort and an enhancement in strength and mobility. Transverse massage is a method that entails exerting pressure directly on the region that is at a right angle to the muscle fibers, as well as on the tendons and ligaments. This method is employed to mitigate discomfort and facilitate the restoration of connective tissue.[27]

Other conservative treatment options for plantar fasciitis include the utilization of night splints to promote prolonged passive stretching of fascia, heel pads, cortico-steroid injections, taping, and shock wave therapy.[10, 11,12]

Orthoses are used to correct any anatomical abnormalities, while shoes are used to address both anatomical and biomechanical difficulties.[14] The surgical therapy options for plantar fasciitis consist of plantar fasciotomy or plantar fascia release. It is recommended only in exceptionally uncommon situations when conservative treatment has proven ineffective.[24] Research findings demonstrating improved muscle flexibility and joint mobility provide evidence for the rationale of treating patients with reduced mobility.[41]The therapeutic impact can be ascribed to many neurological and biomechanical mechanisms, such as hypoalgesia (diminished pain sensitivity), altered proprioception (body position awareness), motor programming and control, and modifications in tissue fluid. MET may have physiological effects regardless of impaired status. Applications of Mechanical Tissue Engineering (MET) for stretching and increasing the flexibility of myofascial tissue seem to affect the viscoelastic and plastic properties of the tissue, as well as the autonomic-mediated changes in the movement of fluid outside of cells and the transmission of mechanical signals to fibroblasts.[43]

Material and Methods:

A cohort of 30 patients diagnosed with Plantar fasciitis was the subject of a prospective study. The participants were sent to the orthopaedics department and then assessed in the physiotherapy outpatient department of Nims College of Physiotherapy & Occupational Therapy. The inclusion criteria consisted of patients diagnosed with plantar fasciitis between the ages of 20 and 40 years. The exclusion criteria included those with clinical problems for whom therapeutic ultrasonography is not recommended. Individuals suffering from referred pain due to sciatica and other neurological disorders, those with arthritis in the ankle, individuals who have received corticosteroid injections for heel pain, people with metatarsalgia, individuals with vascular issues, and those with ankle deformities or instabilities caused by previous fractures. Indicators employed to assess the outcomes or impacts of something.The VAS is a useful instrument for gathering opinions about how severe pain is perceived. The patient is told to indicate how much pain they are experiencing on a 10-cm line and is questioned about the severity of their pain.Following that, the line gets measured to get a value that may be quantified.

Method:30 people with plantar fasciitis, of both sexes, and ages ranging from 20 to 40, were chosen for this study. The selection criteria were used to choose the participants. Subsequently, these people were randomized to various groups by a random allocation procedure. Subject allocation: Participants were assigned to treatment groups by the use of sealed, opaque envelopes. The lead investigator allocated participants by sequentially selecting the next designated envelope for their therapy. The packet had a sticker indicating either A (Deep transverse friction massage) or B (Ultrasound). Later on, a uniform history was collected, including demographic information such as age, gender, features of symptoms, and occupation. The duration of symptoms and the affected side were documented. Afterwards, the participants were given informed permission and presented with a comprehensive explanation of the study's methodology. In this study a total of 30 participants were randomized to two groups, Group A &B, with 15 individuals in every group. Group A participants underwent Deep transverse friction therapy, whereas Group B participants received Ultrasound therapy. VAS was used to evaluate the pain in both groups. Upon arriving for treatment, subjects in both groups were given a designated time to get ready, during which the heel of the affected foot was left uncovered. The individuals were instructed to promptly notify any discomfort encountered throughout the therapy session. The VAS was used as a measuring tool to obtain the data. This study entailed the gathering of a pre-treatment visual analog score and a post-treatment score.The pre-treatment score was measured before the procedure in each of the six sessions, On the other hand, the six therapy sessions' post-treatment VAS scores were assessed following the therapy.

Method: Participants in group A were placed in an elevated sitting position, with the affected heel crossed over the opposite knee. Subsequently, the affected region was rinsed with water and subsequently dried with a towel prior to the application of the method. The treatment area was then covered with a powder coating to lessen friction and stop blisters from forming. Adjacent to the patient, the therapist administered the therapy. The deep transverse friction massage was administered for a duration of 3 minutes for each session. Using one finger reinforced over the other after palpating the affected fascia. The therapist used a larger, more powerful middle finger positioned over the index finger to effectively massage the muscles through friction. The skin displayed symptoms of dryness and no cream was administered. In order to avoid bruising, it was essential for the therapist's skin and the patient's skin to synchronize their movements during friction. The main determinant of friction is the application of substantial pressure while moving over the

tissue, within the patient's tolerance threshold. The friction steadily decreased until a state of anesthesia was reached. The patient will engage in active exercises encompassing the entire range of motion, followed by friction treatment, provided they can complete the activity with minimum discomfort. Following the procedure, the patient was put in a comfortable posture and given instructions to perform a series of exercises that required the least amount of pain over their whole range of motion. Ultrasonography was performed on the participants in group B. The ultrasonic treatment will be applied at an intensity of 1 watt per square centimeter for a period of 6 minutes. The ultrasound will be emitted in pulses with a ratio of 1:4 and a frequency of 1 megahertz. The therapy will consist of 6 sessions, with each session lasting for 6 sittings. Each participant was allocated a maximum of six therapy sessions. The participants were positioned in a prone posture, with their feet placed outside the bed. The heel that was impacted was cleaned using a cloth, and gel was administered to the affected region. The transducer head was thereafter rotated in a deliberate circular pattern for a period of 5 minutes. Every patient received the selected treatment for a total of 6 sessions, which took place over a period of 6 days. The outcome measurements were evaluated using a Visual Analog Scale (VAS) prior to and following the therapy. After a 6-day intervention, outcome measures were recorded post-treatment, and the resulting data was used for statistical analysis.

Result:

An analysis and interpretation will be conducted on the data obtained from 30 subjects diagnosed with plantar fasciitis. The collected data were systematically analyzed and interpreted using inferential statistics. An experiment with controlled variables has been conducted to compare different factors.Thirty individuals in total were divided into two groups (A & B) at random, with fifteen people in each group. Group A was administered deep transverse friction massage, whereas Group B underwent Ultrasound treatment. The study results were examined both within and between groups.The analysis of data within groups was conducted using the Wilcoxon's Sign rank test. while the Mann Whitney U test was used to compare data between different groups. The significance of the disparity between pre and post treatment VAS values in both groups was evaluated using the non-parametric statistical technique called Wilcoxon's Signed Rank test. To determine the statistical importance of the variation between the two procedures, the Mann Whitney U test was employed. Deep transverse friction and ultrasound are two therapeutic techniques. An investigation comparing the pain levels of both groups was undertaken. A comparative analysis of the visual analog scale (VAS) scores was performed for both groups before and after therapy on the first and sixth days. The data analysis was performed utilizing the statistical program SPSS version 15. Graphs and tables were created using Microsoft Word and Excel.

Groups	Mean	Sum of Rank	P value	Critical value
Group A	8.0	0	0.0001* (P<0.05)	30
Group B	8.0	0	0.000* (P<0.05)	30

Table 1: intra group analysis, Significance of Post treatment VAS score for both groups, (Wilcoxon Signed rank Test)

Groups	Mean	Sum of Rank	**U** value	P value
Group A	8.0	R [1]-138.5	165.0	0.0015
Group B	8.0	R [2] -300		

Table 2: Inter group analysis, Comparison of Post Score of VAS for Both groups, (Mann Whitney U Test)'

During the intra-group analysis, Group A, which had therapy with the deep transverse friction approach, showed an average rank of 8 and a cumulative rank of 0.The P value was calculated to be 0.0001, suggesting statistical significance (P<0.05).This demonstrates unequivocally that the therapeutic strategy was successful in lowering discomfort. The table presents the mean rank of B group , which was subjected to Ultrasound treatment, as 8.The cumulative sum of the ranks is 0, and the P value is 0.000, which suggests strong statistical significance (P<0.05).The data clearly and indisputably show that the therapeutic technique is very effective in reducing pain.In the intergroup analysis, Group A has an average rank of 8 and a cumulative rank (R1) of 138.50.In contrast, Group B has an average rank of 8 and a total sum of ranks (R2) that amounts to 300. The U test resulted in a value of 165.0, accompanied with a P value of 0.0015.The P value is statistically significant because it is lower than the predefined threshold of 0.0015.

The analysis indicates that B group (Ultrasound) is superior to Group A in terms of effectiveness (DTFM) in reducing pain.

Chart 1 A – Intra group analysis, Pre - Post Mean values of VAS score in Group A

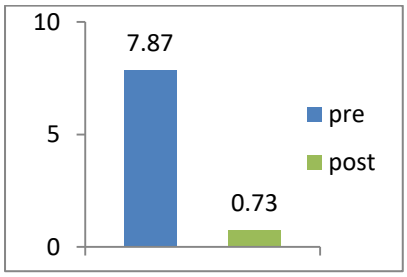
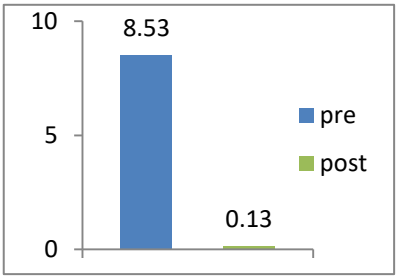


Chart 1 B – Intra group analysis, Pre - Post Mean values of VAS score in Group B



Treatment	Group A (DTF)		Group B(Ultrasuond)	
	Mean	S.D	Mean	S.D
Pre	7.87	± 1.16	8.533	± 0.516
Post	0.73	± 0.488	0.133	± 0.3519
Average Diff.	7.140		8.400	
% Of change	90.04		98.42	

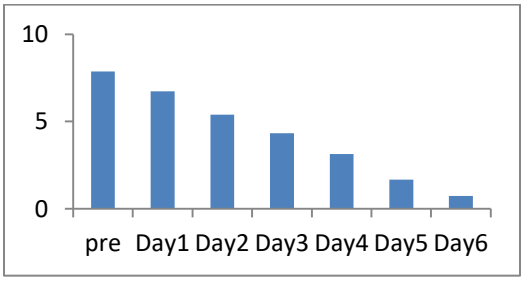
Table 3, Mean average difference, percentage of change in both groups, and intergroup analysis.

The pre-treatment mean value for Group A is 7.87 in the preceding table, with a 1.16 standard deviation.After therapy, the mean value is 0.73, with a 0.481 standard deviation.The mean value displays a 90.04% relative change and a mean deviation of 7.26.Group B's pre-treatment average is shown in the table as 8.533, with a 0.516 standard deviation.Post treatment, the mean value is 0.133 with a standard deviation of 0.3519.The average difference and percentage change for the mean value are 8.40 and 98.42%, respectively.The statistical analysis clearly shows that the treatment given to Group B is much more effective than the treatment given to Group A in reducing pain caused by plantar fasciitis. This is evident from the average mean differences and percentage change observed.

Group	Pre	D1	D2	D3	D4	D5	D6
A	7.870	6.730	5.40	4.330	3.130	1.670	0.730

Table 4, Mean reduction of pain on different days in group A

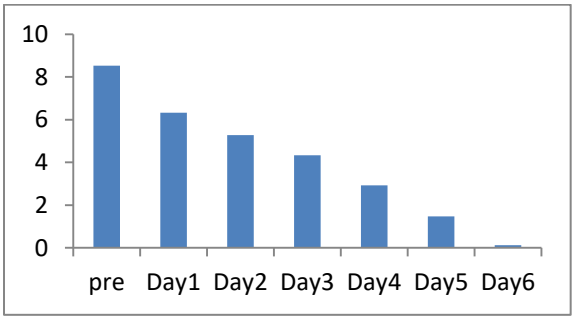
Chart 2 A- shows the mean reduction of pain on different Days for group A



Group	Pre	D1	D2	D3	D4	D5	D6
B	8.53	6.33	5.27	4.33	2.93	1.47	0.13

Table 5, Average Pain Reduction in Group B on Various Days

Chart 2 B – demonstrates the average pain decrease for Group B over several days.



Discussion:

This study investigates the effects of Deep Transverse Friction Massage in comparison to Ultrasound therapy on persons with plantar fasciitis. This study revealed that both therapy groups had enhancements in alleviating pain in people with plantar fasciitis. Nevertheless, after 6 sessions, group B, which underwent treatment with Ultrasound, demonstrated a more significant decrease in pain compared to group A, which received treatment with deep transverse friction massage. The study's findings support that there is a significant difference in the effectiveness of Deep transverse friction massage and Ultrasound in treating patients with Plantar fasciitis, as indicated by the outcome factors. Plantar fasciitis is a problem that arises from overuse and typically shows considerable improvement with non-invasive treatment. To restore optimal muscle lengths and joint motions, several manual therapy approaches were employed to modify soft tissue. Stretching exercises were mostly employed in the early therapies to target the fascia and the gastrocnemius-soleus muscle.The objective was to reduce tension and excessive muscle contraction and to reestablish regular movement of the myofascial tissue. Namik sahinet et al[47] examined the many risk variables linked to the development of plantar fasciitis. These risk factors encompass anatomical and biological characteristics that make individuals more vulnerable to this illness. Thefactors that contribute to this condition include age progression, obesity, specific pathologies such as decreased ankle dorsiflexion, unequal limb length, thick heel fatty pad, increased thickness of the plantar fascia, flat feet, excessive foot pronation, high arches, muscle strength imbalance, limited movement of the first metatarsophalangeal joint, and the presence of a calcaneal spur. In addition, aside from the anatomical and biochemical characteristics Various well-known causes contribute to the strain experienced by the body when standing or walking for long periods, including the use of unsuitable footwear.[17,18.76] Davis et al. (1988) discovered that fewer than 50% of patients experiencing prolonged heel pain reported being fully satisfied with the results of surgical intervention. Conflitti and Tarquinio[89] saw a notable degree of contentment among their patients, as only 57% reported no impairments in their functioning following the surgery. Nevertheless, the majority of nonoperative treatments for palantar fasciitis have demonstrated favorable or encouraging results. The therapies encompass stretching exercises, ultrasound, shock wave therapy, and a variety of other techniques. Two comparisons were undertaken in this inquiry, comparing the VAS scores before and after therapy on the first and sixth day, respectively. An evident discrepancy in pain levels between the two groups was identified. The ultrasound showed a significant and immediate decrease in discomfort with each session. The present study demonstrated that Deep transverse friction massage and Ultrasound significantly reduce the level of pain when evaluated both pre and post therapy

(P<0.001). An analysis of intragroup interventions, specifically deep transverse friction massage (Group A) and ultrasound (Group B), demonstrates a significant decrease in pain in both groups. Inter-group research findings indicate that Group B demonstrates a much higher level of success compared to Group A in lowering pain levels. Thus, we can confidently embrace the alternative hypothesis. The results of our study show that Group B, who underwent Ultrasound treatment, exhibited a significant improvement of 98.42%.The Group A, which underwent Deep transverse friction massage, showed a substantial improvement of 90.04%.The percentage change clearly indicates that the treatment given to Group B is substantially more effective than the treatment given to Group A in reducing discomfort related to plantar fasciitis.

Conclusion:

The primary finding of this research is that DTFM is less beneficial than ultrasound in easing the pain associated with plantar fasciitis. During the course of the therapy session, individuals in both groups reported feeling less intense pain. Group B saw a notable decrease in pain intensity immediately following theprocedure. Ultrasound is an effective therapeutic method for alleviating pain in those suffering from plantar fasciitis.

Relevance of Clinica Practice:

This study reveals a significant reduction in heel pain with Plantar fasciitis treated with Deep transverse friction massage and Ultrasound. Upon careful comparison of both treatment methods, it was concluded that when it comes to treating heel pain, ultrasound works better than DTFM. Thus, this study establishes that Ultrasound is a remarkably advantageous and efficient instrument in clinical practice. It conforms to the current practice of clinical physiotherapists in order to alleviate heel pain in individuals suffering from plantar fasciitis.

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