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An Study To Asses The Role Of Acupuncture Points In Patients With Non-Specific Upper Limb Pain: A Randomized Control Trial

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ABSTRACT

Background: Upper limb pain is a multifactorial condition often arising from musculoskeletal, neurological, or postural origins. Traditional physiotherapy remains a mainstay of treatment, yet integrating alternative approaches like acupressure, rooted in Traditional Chinese Medicine (TCM), may enhance therapeutic outcomes. The myofascial meridian concept parallels acupuncture meridians and offers a scientific rationale for acupressure in clinical settings.

Objective: To evaluate and compare the effectiveness of acupressure-based kneading of meridian points integrated with physiotherapy versus traditional physiotherapy alone in reducing upper limb pain and improving functional capacity.

Methods: A randomized experimental study was conducted with 60 participants divided into two groups (n=30 each). Group I received a standard physiotherapy regimen, while Group II underwent meridian-based kneading of acupoints combined with exercise. Outcomes were assessed pre- and post-intervention using the Visual Analog Scale (VAS) for pain and the Quick DASH questionnaire for upper limb disability. Demographic data, occupational background, and side of involvement were also analyzed.

Results: Both groups demonstrated statistically significant improvements in pain and functional outcomes ($p < 0.001$). However, Group II showed superior results, with VAS scores decreasing from 5.79 ± 2.13 to 0.79 ± 0.77 and Quick DASH scores dropping from 45.31 ± 15.71 to 3.81 ± 4.55. In contrast, Group I's VAS decreased from 6.48 ± 1.51 to 4.75 ± 2.03, and Quick DASH from 59.31 ± 14.39 to 43.05 ± 13.90. No significant differences were observed between genders or age groups in outcome, although females in Group II showed slightly better functional recovery.

Conclusion: Integrating acupressure-based kneading of meridian points with physiotherapy significantly enhances pain relief and functional recovery in individuals with upper limb pain compared to physiotherapy alone. These findings support a multimodal, holistic treatment approach and encourage further exploration into acupressure-physiotherapy integration for other musculoskeletal conditions. Acupressure point kneading with traditional physiotherapy is more effective in upper limb pain management than only traditional physiotherapy or acupressure point kneading

Keywords: Upper limb pain, acupressure, physiotherapy, meridian points, Quick DASH, VAS, integrative therapy, musculoskeletal rehabilitation

1. INTRODUCTION

Non-specific upper limb pain (NSULP) is a common musculoskeletal complaint characterized by pain without a definitive pathological diagnosis, such as rotator cuff tears, cervical radiculopathy, or tendinitis. This condition is often diagnosed by exclusion and can present with diffuse pain, functional limitations, and psychosocial distress, making its management particularly challenging.[iii]

Conventional physiotherapy—including exercise programs, manual therapy, and modalities such as ultrasound or TENS—remains a mainstay in the treatment of upper limb pain. However, despite the effectiveness of these interventions, residual symptoms persist in many patients, prompting investigation into complementary approaches.[iii]

One such adjunctive method is the use of acupuncture points, particularly through acupressure or kneading. Traditional Chinese Medicine (TCM) conceptualizes acupuncture points as energy centers along meridians through which "Qi" flows. These meridians are believed to have both superficial and deep anatomical relationships with musculoskeletal and visceral structures.[ivv] Emerging anatomical evidence, such as Myers' myofascial meridian theory, aligns many of these pathways with fascial lines, providing a possible physiological explanation for the clinical effects of acupuncture point stimulation.

This study seeks to evaluate the clinical efficacy of kneading acupuncture points as part of a physiotherapeutic regimen in patients with NSULP. The goal is to determine whether integrating acupoint stimulation with exercise therapy enhances pain reduction and functional recovery compared to physiotherapy alone.

2. BACKGROUND

Upper limb pain often arises from diverse causes—neurological, musculoskeletal, or vascular—but in cases labeled as non-specific, symptoms do not correlate with observable structural abnormalities. These patients frequently suffer prolonged discomfort and disability without conclusive diagnostic findings. As a result, treatment often becomes trial-and-error, with limited long-term success.

Traditional Chinese Medicine offers an alternate understanding of musculoskeletal pain through the meridian system. The upper extremity is traversed by several principal meridians, including the Heart, Lung, Large Intestine, and Pericardium channels, which influence both internal organ function and musculoskeletal health. Each meridian consists of a superficial pathway containing acupuncture points and a deeper trajectory connecting to internal organs.

Recent anatomical studies have revealed fascinating overlaps between acupuncture meridians and modern fascial networks. Thomas Myers' "Anatomy Trains" concept, particularly the deep front line, closely parallels the Kidney and Liver meridians in TCM, suggesting shared physiological or anatomical pathways.[vi] These connections support the hypothesis that acupuncture points may represent neurovascular and myofascial junctions, capable of influencing both local and systemic processes.

Kneading, a technique frequently used in manual therapy, involves rhythmic compression and circular movement to improve circulation, reduce muscle tension, and realign disorganized collagen fibers.[vii] When applied to acupuncture points, kneading may enhance not only local blood flow but also stimulate autonomic and neurological responses believed to regulate pain perception.[viii]

Despite evidence supporting acupuncture and acupressure in specific conditions—such as post-stroke shoulder pain, adhesive capsulitis, and periarthritis—most studies have focused on narrowly defined populations or single-intervention designs.[ixxxi] There is limited literature investigating the effect of combining acupoint kneading with physiotherapy in patients suffering from broader, non-specific upper limb pain.

This study was thus designed to fill this gap, using validated outcome measures such as the Visual Analog Scale (VAS) and QuickDASH questionnaire to assess improvements in pain and function. By integrating the Eastern philosophy of meridians with Western physiotherapeutic techniques, this research aims to propose a holistic and evidence-based management strategy for NSULP.

3. OBJECTIVES

Primary Objective

To evaluate the effectiveness of kneading acupuncture points in reducing pain among individuals with non-specific upper limb pain.

Secondary Objectives

To assess the improvement in upper limb functional ability using the QuickDASH questionnaire following acupoint-based intervention.

To compare the outcomes of a conventional physiotherapy exercise program versus a combined intervention involving kneading of acupuncture points and exercises.

To analyze the influence of demographic factors (age, gender, occupation, and affected side) on treatment response.

To determine whether integrating acupressure with physiotherapy enhances patient-reported outcomes compared to physiotherapy alone.

Research Question

Does the integration of acupuncture point kneading with conventional physiotherapy exercises lead to a greater reduction in pain and improvement in functional outcomes in patients with non-specific upper limb pain compared to physiotherapy exercises alone?

4. HYPOTHEIS

Null Hypothesis (H_0):

There will be **no significant difference** in pain reduction and functional improvement between patients receiving conventional physiotherapy alone and those receiving physiotherapy combined with acupuncture point kneading for non-specific upper limb pain.

Alternative Hypothesis (H_1):

Patients receiving **acupuncture point kneading combined with physiotherapy** will demonstrate a **significantly greater reduction in pain** and **improvement in functional outcomes** compared to those receiving physiotherapy alone for non-specific upper limb pain.

INCLUSION CRITERIA

Age group: (18-40 yrs)

Males and Females with upper limb pain.

EXCLUSION CRITERIA

Age group: Less than 18 and above 40 y

Metabolic Disorder and neurological disorder patients

Scar patients

patient with fracture

Open wound

Bankart lesion, soft tissue injury

Radiculopathy

Methodology

Study Design

This study was designed as an experimental, pre-post interventional study to evaluate the effectiveness of acupuncture point kneading combined with physiotherapy in individuals experiencing non-specific upper limb pain.

Study Duration

The research was conducted over a 12-month period, encompassing participant selection, intervention, follow-up, and data analysis.

Study Setting

The study was carried out in a clinical rehabilitation setting where patients with chronic upper limb pain sought physiotherapy services.

Sampling Method

A purposive sampling technique was employed to select participants who met the inclusion criteria for non-specific upper limb pain without identifiable neurological or orthopedic pathology.

Sample Size

A total of 60 participants were included in the study and divided equally into two groups:

Group I (n = 30): Received conventional physiotherapy treatment.

Group II (n = 30): Received acupuncture point kneading in addition to physiotherapy.

Inclusion Criteria

Adults aged 20–60 years

Individuals diagnosed with non-specific upper limb pain lasting for more than 3 months

Willingness to participate and provide informed consent

Exclusion Criteria

Patients with diagnosed neurological disorders, fractures, or malignancies

History of surgery in the affected limb

Presence of systemic inflammatory conditions (e.g., rheumatoid arthritis)

Pregnancy

Intervention Protocol

Group I: Underwent conventional physiotherapy management including exercises for range of motion, strengthening, and postural correction.

Group II: Received kneading at identified acupuncture points related to the upper limb meridians (e.g., LI4, PC6, LU5), along with the same physiotherapy regime as Group I.

Outcome Measures

Pain Intensity – measured using the Visual Analog Scale (VAS)

Functional Ability – measured using the QuickDASH (Disabilities of the Arm, Shoulder, and Hand) questionnaire

Both parameters were assessed before and after the 4-week intervention period.

Follow-up

Participants were followed up post-intervention to assess the sustainability of improvement, with data collected immediately after the treatment phase.

Statistical Analysis

Data were analyzed using paired t-tests for intra-group comparison (pre- and post-treatment values).

A significance level of $p < 0.05$ was set to determine statistical significance.

Descriptive statistics (mean, standard deviation, percentage) were used to describe demographic variables.

5. PROCEDURE

Randomly dividing both male and female upper limb patients as per iclusion criteria and exclusion criteria into two groups exercise group and acupuncture group. Exercise group will be treated using traditional physiotherapy exercises used in upper limb pain cases such as:

Scapular Stabilization exercises

Rowing

Exercise for triceps

Progressive resistance exercises

Stretching for pectoralis group

Acupuncture group.

Treatment Protocol for Upper Limb Pain

Patients underwent kneading techniques targeting specific meridians associated with upper limb discomfort, alongside prescribed exercises outlined for the exercise group.

1. Pericardium (Pc) Meridian

Pathway: Begins at the chest lateral to the nipple, ascends to the axillary fossa, and descends along the anterior-medial aspect of the arm to the cubital fossa. It continues between the Palmaris Longus and Flexor Carpi Radialis muscles, ending at the tip of the middle finger.

Clinical Use: Primarily targeted for arm pain and discomfort around the axillary fold.

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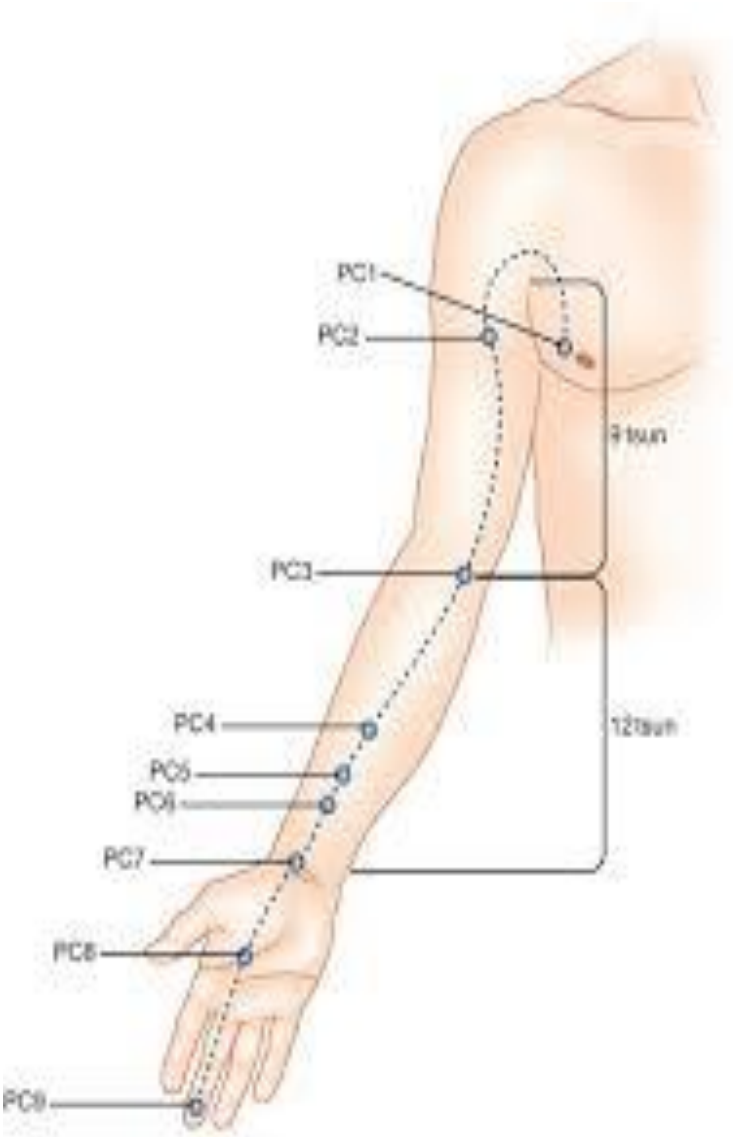
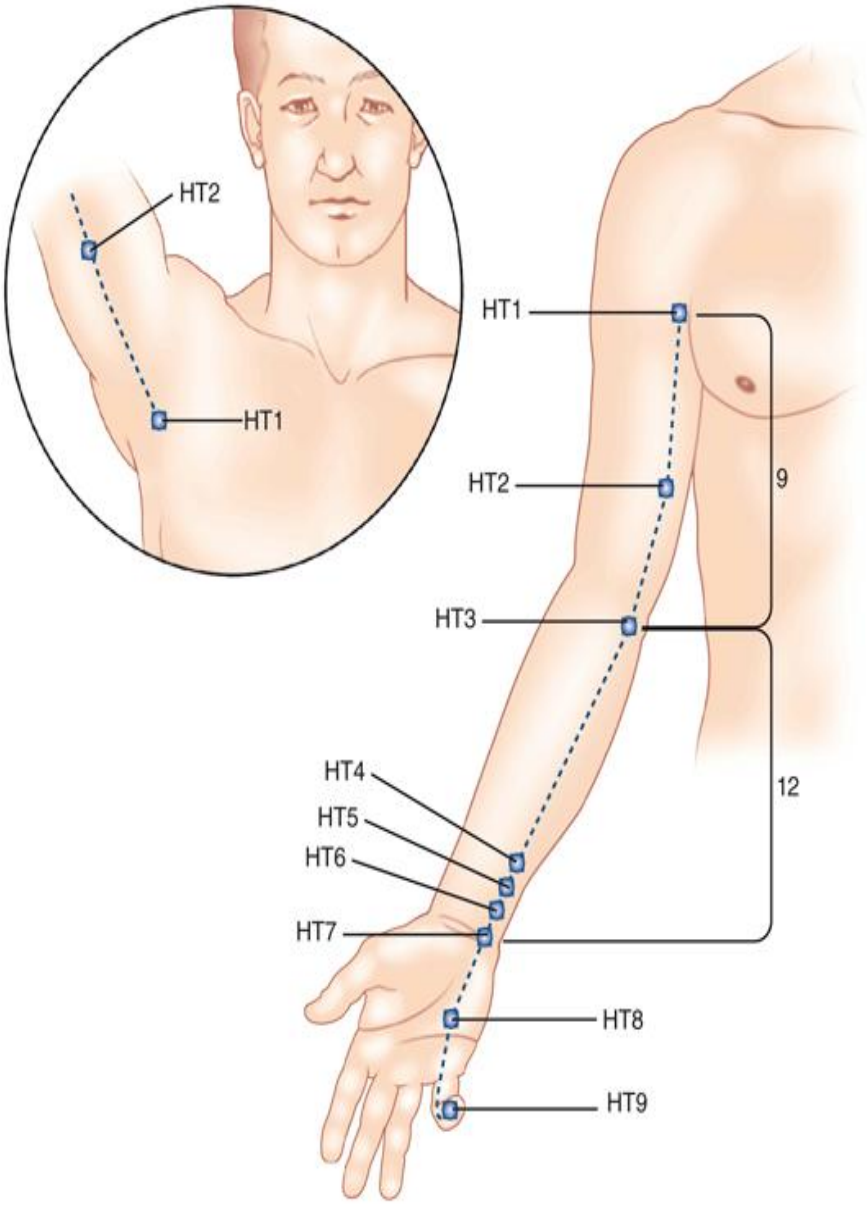


2. Heart (Ht) Meridian

Pathway: Originates from the center of the axilla, runs downward along the anterior-medial side of the arm, and reaches the tip of the little finger.

Clinical Use: Effective for managing paresthesia and pain in the forearm and hand, elbow injuries, and stiffness of the neck.



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3. Lung (LU) Meridian

Pathway: Starts from the lateral chest, travels through the anterior-medial side of the upper arm, crosses over at the cubital fossa, and continues down to the radial side of the wrist, ending at the tip of the thumb.

Clinical Use: Beneficial in treating facial paralysis, elbow and shoulder joint pain, and soft tissue injuries.

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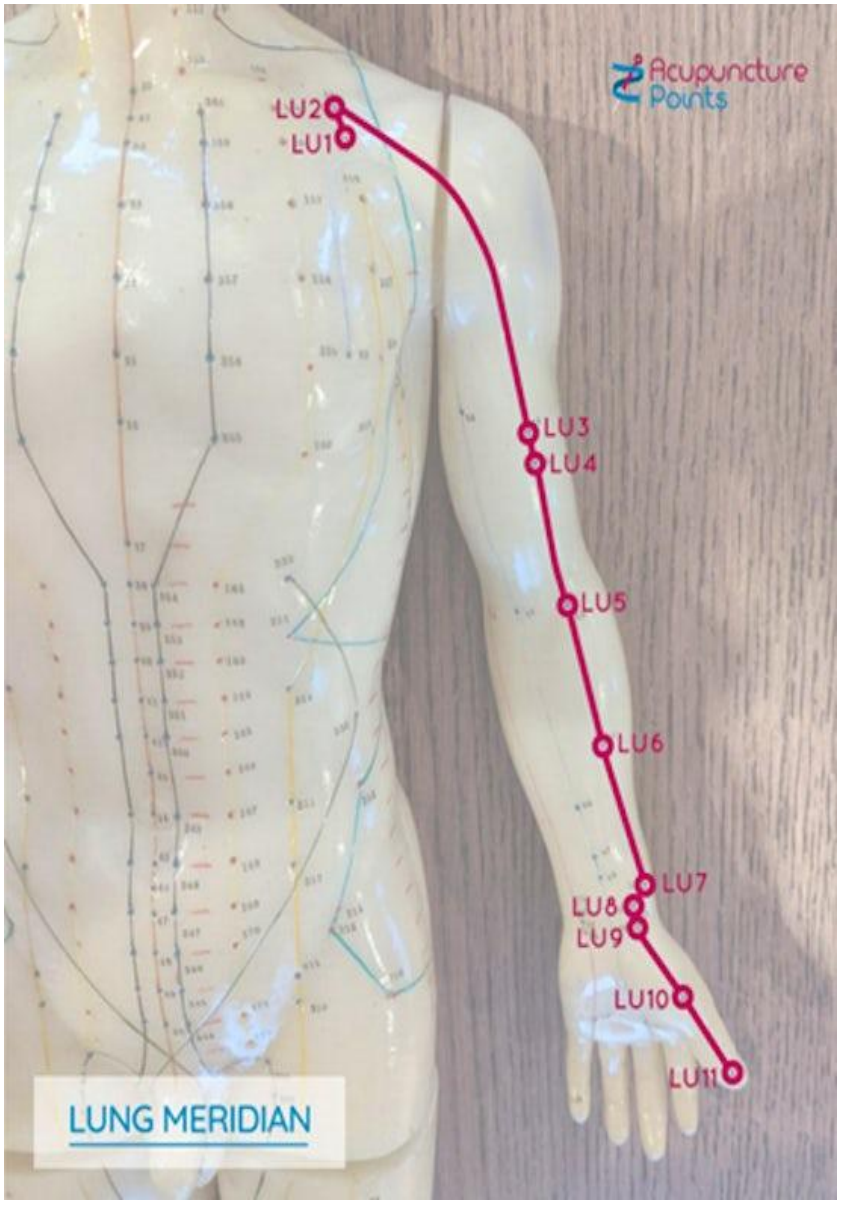

4. Triple Heater (TH) Meridian

Pathway: Emerges from the tip of the ring finger, travels along the posterior aspect of the arm, passes through the shoulder, and concludes at the outer end of the eyebrow.

Clinical Use: Used to alleviate facial pain, restricted shoulder movement, and pain in the arm or elbow.

Image:

5. Small Intestine (SI) Meridian

Pathway: Originates at the tip of the little finger, moves upward along the ulnar side of the arm to the scapula, zigzags across it, and ends at the front of the ear.

Clinical Use: Helpful for improving motor function in the arm and easing lumbar or cervical spine stiffness and pain.

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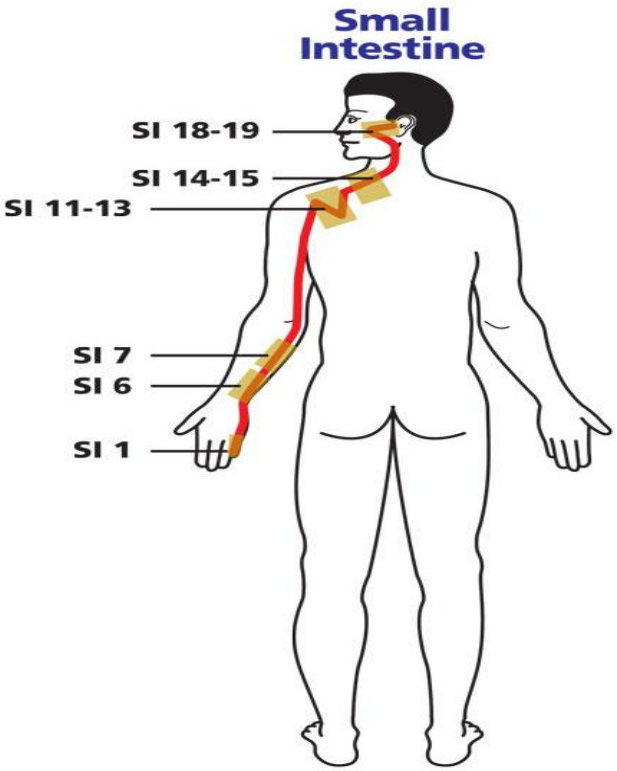

6. Large Intestine (LI) Meridian

Pathway: Begins at the tip of the index finger, ascends along the lateral aspect of the arm to the shoulder, and continues upwards, terminating at the opposite side of the face.

Clinical Use: Commonly involved in managing shoulder pain and arm disorders.

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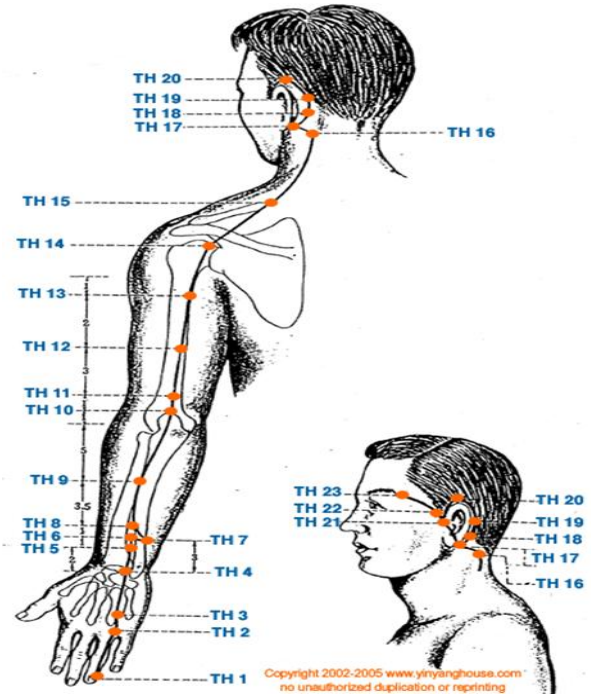
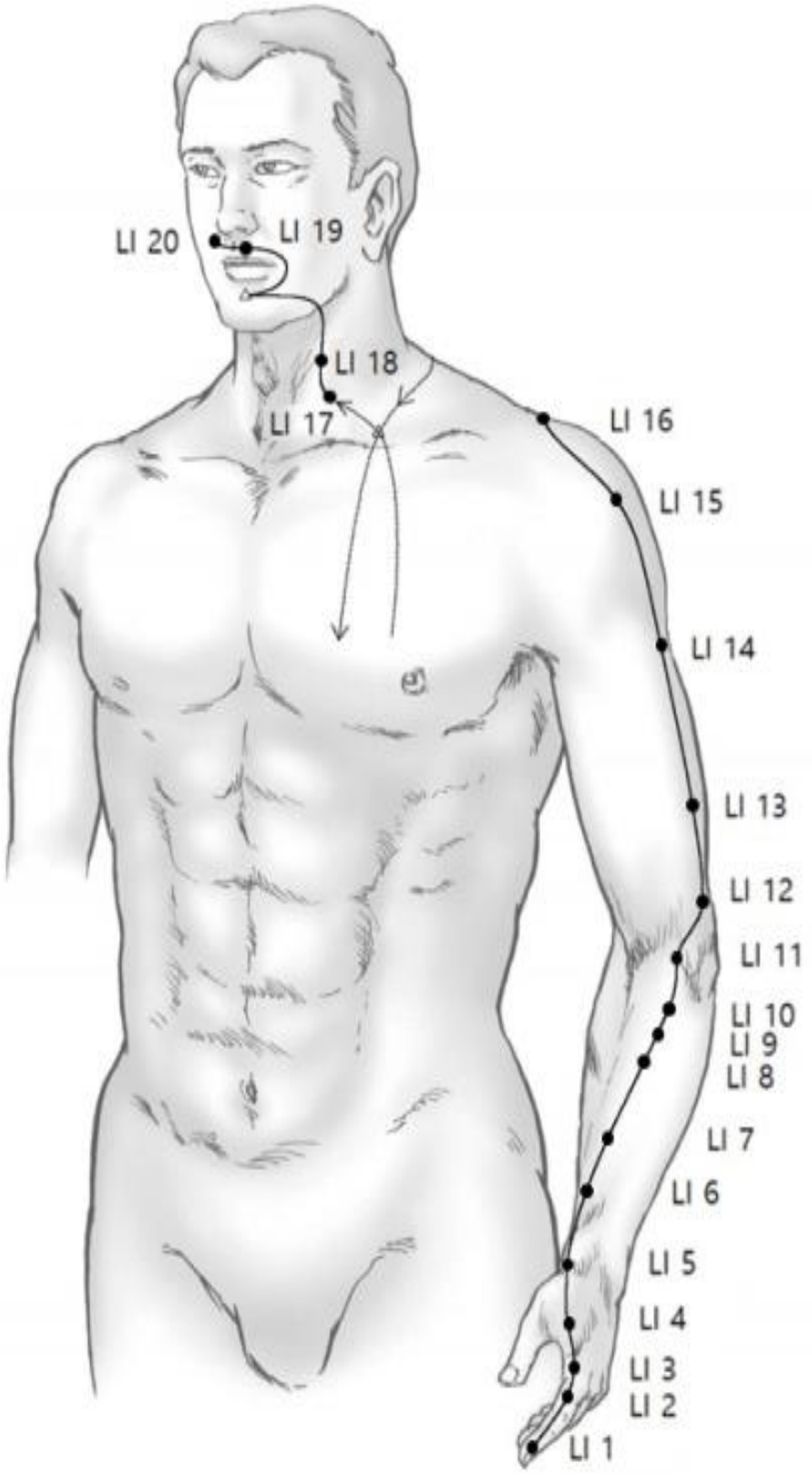
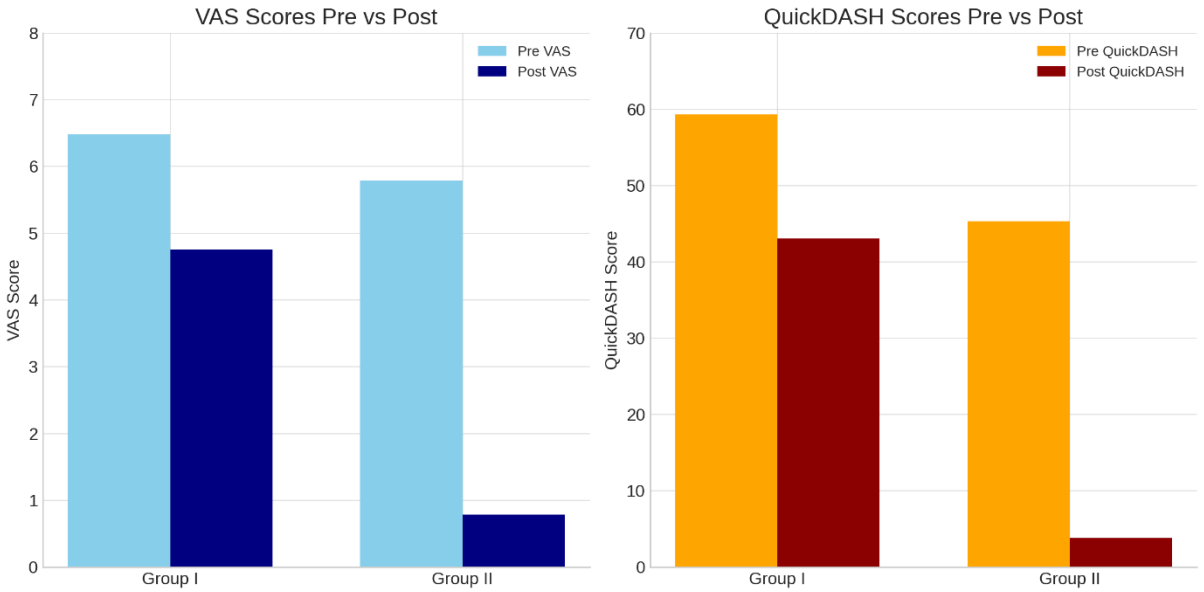




Results & Tables



Demographic Profile

Gender distribution was nearly balanced in both groups:

Group I: 53.33% Male, 46.67% Female

Group II: 50% Male, 50% Female

Age distribution showed Group I had younger participants (majority in 21–40 years), while Group II had older individuals (predominantly 41–60 years).

Affected Side

Right-sided symptoms were dominant in both groups:

Group I: 86.67% right side

Group II: 80% right side

Gender-wise and age-wise distribution followed similar patterns with no significant bias.

Occupational Background

Group I: Tailors (20%), Housewives (20%), Ward Boys (13.33%)

Group II: Housewives (40%), Tailors (13.33%), Puri Makers (10%)

Occupations involving repetitive upper limb use were highly represented.

Pain Duration

Mean duration of pain was similar in both groups:

Group I: 4.22 ± 1.13 years

Group II: 3.98 ± 1.05 years

No statistically significant differences were noted ($p > 0.05$)

VAS (Visual Analog Scale) Scores

Group	Pre-Op Mean ± SD	Post-Op Mean ± SD	P-value
Group I	6.48 ± 1.51	4.75 ± 2.03	< 0.001
Group II	5.79 ± 2.13	0.79 ± 0.77	< 0.001

Group II showed a greater pain reduction, indicating higher treatment efficacy.

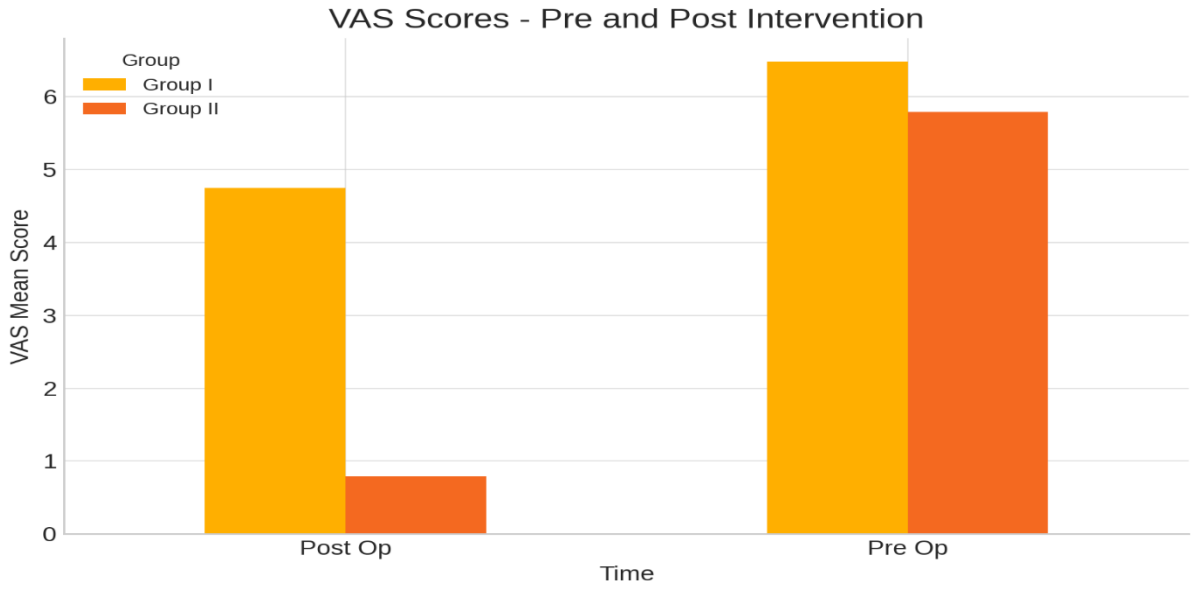
Age and gender subgroups within each group also reflected statistically significant improvements, especially in Group II.

QuickDASH Scores (Disability Assessment)

Group	Pre-Op Mean ± SD	Post-Op Mean ± SD	P-value
Group I	59.31 ± 14.39	43.05 ± 13.90	< 0.001
Group II	45.31 ± 15.71	3.81 ± 4.55	< 0.001

Group II achieved marked improvement in function, confirmed by gender and age-based analysis.

Females in Group II showed slightly superior post-treatment function compared to males ($p < 0.05$).



The study involved 60 participants divided equally into Group I (exercise with kneading acupoints) and Group II (exercise with acupressure). Gender distribution was almost equal across both groups, with a slightly higher percentage of males in Group I (53.33%) and equal male-female distribution in Group II (50% each). Age-wise, Group I included more younger participants (36.67% in 21–30 yrs and 50% in 31–40 yrs), while Group II had older individuals (43.33% in 41–50 yrs and 23.33% in 51–60 yrs).

Right-side involvement was predominant across both groups, notably 86.67% in Group I and 80% in Group II. Occupational analysis showed that housewives and tailors were most represented in both groups, hinting at repetitive upper limb tasks contributing to pain development. The average duration of pain was similar across both groups, with no statistically significant gender difference.

Pain severity was measured using the Visual Analog Scale (VAS). Group I showed a statistically significant decrease from a mean of 6.48 to 4.75 ($p < 0.001$), while Group II exhibited a much more substantial reduction from 5.79 to 0.79 ($p < 0.001$), indicating superior clinical efficacy. Age-wise and gender-wise analyses showed significant improvements across both groups, with no major inter-gender or inter-age differences.

Functional outcomes assessed via the QuickDASH score demonstrated substantial improvements. Group I's scores dropped from 59.31 to 43.05 ($p < 0.001$), while Group II's decreased dramatically from 45.31 to 3.81 ($p < 0.001$). Notably, Group II's females showed better post-treatment functional outcomes compared to males ($p < 0.05$). Across all age groups in both groups, significant functional improvement was noted, with Group II consistently outperforming Group I.

6. DISCUSSION

This study investigated the effectiveness of kneading acupuncture points integrated with physiotherapy exercises in managing non-specific upper limb pain. The results clearly demonstrate that both groups improved significantly in pain and functional outcomes, but participants in Group II—who received targeted acupressure stimulation—achieved more profound results.

The gender and age distribution showed minimal influence on overall treatment outcomes, although younger individuals in Group I and older participants in Group II were more prevalent. These differences did not skew the statistical outcomes. The

predominance of right-side pain reflects dominant-hand overuse, especially among housewives and manual workers such as tailors and puri makers, supporting prior literature associating repetitive strain with upper limb dysfunction (Walker-Bone et al.).

The effectiveness of acupressure as an adjunct to physiotherapy is consistent with previous findings by Zhan et al. and Cassileth et al., highlighting its potential to significantly enhance outcomes in musculoskeletal rehabilitation. Moreover, the study aligns with Dorsher's and Myers' theories linking myofascial lines with acupuncture meridians, offering a plausible anatomical explanation for the clinical improvements observed.

Functional recovery indicated by QuickDASH scores supports the integration of traditional Eastern therapies into modern physiotherapeutic regimens. This integrative model can redefine rehabilitation strategies by addressing not just the physical but also the energetic and fascial dimensions of musculoskeletal pain.

7. CONCLUSION

This experimental study affirms that acupressure, when integrated with standard physiotherapy, significantly reduces pain and improves function in patients with non-specific upper limb pain. Group II's superior results in both VAS and QuickDASH scores underline the clinical value of acupuncture point-based therapy. These findings advocate for a broader adoption of acupressure as a complementary modality in routine physiotherapy, especially in populations at risk due to repetitive upper limb activity.

8. LIMITATIONS

The sample size was limited to 60 participants, which may restrict generalizability.

The follow-up duration was limited to the study period and did not assess long-term efficacy.

The study relied on subjective outcome measures (VAS and QuickDASH) which, while validated, could be influenced by patient perception.

Acupoint selection and kneading techniques were standardized but may vary in real-world practice.

No blinding was done, possibly introducing observer bias.

9. RECOMMENDATIONS

Future studies should include a larger and more diverse sample to validate and generalize findings.

Long-term follow-up assessments are needed to evaluate sustained benefits.

Comparative studies using other acupuncture modalities (e.g., electroacupuncture) could further enrich treatment options.

Educational programs on incorporating acupressure into physiotherapy should be developed for clinical practitioners.

Further biomechanical and imaging-based research may help establish the underlying physiological mechanisms of acupoint-based therapy.

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