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Impact of soft tissue techniques and neuromuscular re-education on patients with poor posture and related neck pain or knee osteoarthritis

Submission date
25/09/2024

Recruitment status
No longer recruiting

Registration date
24/06/2025

Overall study status
Completed

Last Edited
24/06/2025

Condition category
Signs and Symptoms

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Neck pain (cervicalgia) and knee osteoarthritis are common musculoskeletal conditions that significantly impact an individual's quality of life, leading to pain, decreased functionality, and limited mobility. These conditions are often associated with muscular imbalances, joint instability, and poor postural alignment, which contribute to the chronicity and severity of symptoms. Cervicalgia often results from poor posture, repetitive strain, or degenerative changes in the cervical spine, leading to discomfort and restricted movement. On the other hand, knee osteoarthritis is a degenerative joint disease that causes pain, stiffness, and reduced mobility due to the breakdown of cartilage in the knee joint. This study aims to evaluate the effectiveness of a specialized stabilization exercise program designed to improve the functionality of patients with neck pain or knee osteoarthritis. The study seeks to determine how targeted exercises focusing on muscle strengthening, joint stabilization, and postural correction can alleviate pain, improve range of motion, and enhance overall quality of life for individuals with these conditions. By assessing the short- and long-term effects of these exercises, the study plans to provide valuable insights into non-invasive, exercise-based treatments for managing cervicalgia and knee osteoarthritis, potentially offering an alternative or complementary approach to conventional treatments.

Who can participate?
Patients with neck pain (cervicalgia) and patients with knee osteoarthritis

What does the study involve?
The study involves the implementation of specific stabilization exercises aimed at improving the functionality of patients with neck pain (cervicalgia) or knee osteoarthritis. The participants will undergo a structured exercise program that focuses on strengthening the muscles around the affected areas, enhancing joint stability, improving range of motion, and reducing pain.

What are the possible benefits and risks of participating?
The potential benefits for a patient with neck pain or knee osteoarthritis from participating in a study that implements specific stabilization exercises aimed at improving their functionality may include:
Targeted stabilization exercises can help reduce pain by strengthening the muscles that support the affected joints, leading to decreased strain and improved joint alignment.
By engaging in exercises designed to enhance stability, patients may experience an increase in the range of motion in their neck or knee, allowing for greater flexibility and ease of movement.
Stabilization exercises often focus on strengthening the muscles around the joints, which can lead to increased muscle endurance and the ability to better support daily activities without discomfort.
For patients with neck pain, stabilization exercises can help correct postural imbalances, potentially reducing the forward head posture and other alignment issues that contribute to pain and dysfunction.
Patients with knee osteoarthritis may benefit from exercises that stabilize the knee joint, reducing the likelihood of further injury and enhancing their ability to perform daily tasks with less discomfort.
These exercises are often designed to target functional movements, such as walking, sitting, or bending, enabling patients to improve their overall quality of life by making these activities easier and less painful.
Regular participation in a stabilization exercise program may help prevent future flare-ups of pain or discomfort, contributing to better long-term management of neck or knee conditions.
By improving strength, flexibility, and joint stability, these exercises can contribute significantly to the patient's overall rehabilitation and return to normal activities.
The risks associated with participating in this study are minimal. Some individuals may experience mild muscle soreness or fatigue after the manual therapy or exercise sessions. All interventions are non-invasive and will be administered by certified physiotherapists, ensuring participant safety throughout the study.

Where is the study run from?
The study will be conducted in the Therapeutic Exercise and Sports Physiotherapy Lab of the University of Patras lab, which is equipped with the necessary instruments and space to perform the required assessments. These labs provide the environment for all the measurement procedures, including the evaluation of sway back posture, pain, muscle strength, range of motion, and functionality assessments.

When is the study starting and how long is it expected to run for?
June 2021 to July 2025

Who is funding the study?
University of Patras (Greece)

Who is the main contact?
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Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Protocol serial number
130810

Study information

Scientific Title
The effects of soft tissue techniques and neuromuscular re-education exercises on the functionality of patients with poor posture and accompanying neck pain or knee osteoarthritis

Acronym
PostureNK

Study objectives
The strengthening and correction of the body's center of gravity and, more generally, the core may help positively affect not only spinal pathologies but also peripheral joint conditions, such as knee osteoarthritis. This can be explained by the balancing of loads on the peripheral joints that may result from correcting body posture. Specifically, potential correction of the core and pelvis will reduce both compressive and shear forces on the lower limb joints.

Despite the significant epidemiological prevalence of cervical syndrome and knee osteoarthritis and their impact on patient functionality, there is a notable scientific gap in the international literature regarding the effects of soft tissue techniques and neuromuscular re-education exercises on reducing the negative adaptations associated with cervical syndrome and knee osteoarthritis. To date, the short-term and especially the long-term therapeutic effects of myofascial release techniques or IASTM techniques combined with a targeted neuromuscular re-education exercise program on improving poor posture accompanied by neck pain or knee osteoarthritis have not been adequately researched and evaluated.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 23/11/2022, Research Ethics and Ethics Committee - University of Patras (Rio, Patras, 26504, Greece; +30 2610 997245; not@available.com), ref: 14750

Primary study design
Interventional

Study design
Randomized controlled trial

Study type(s)
Prevention, Treatment

Health condition(s) or problem(s) studied
Neck and arthritic pain

Interventions
The patients in the study will be randomly divided into four groups: Group A will receive interventions on the neck including ERGON IASTM TECHNIQUE, massage, neuromuscular re-education exercises, and stretches; Group B will receive the same techniques applied to the entire torso; Group C will receive massage to the lower limbs, ERGON IASTM TECHNIQUE, lower limb strengthening exercises, and stretches; and Group D will receive ERGON IASTM TECHNIQUE, massage, neuromuscular re-education exercises, and stretches applied to both the torso and lower limbs. Randomization of the sample will be conducted by an independent volunteer who will welcome the patients in the measurement and treatment area and provide them with questionnaires, including the Neck Disability Index (NDI).

The variables to be assessed in the study will include the improvement percentage of relaxed body posture through the measurement of sway back angle, improvement of pain symptoms through the Visual Analog Scale (VAS), muscle strength using the Microfet 2 handheld dynamometer, range of motion via the Bubble Inclinometer Baseline, and functionality of the upper cervical spine and spine assessed through the Neck Pain Disability Index (NDI). The research variables will be evaluated before and after each session regarding relaxed body posture, pain improvement, range of motion, and muscle strength of the neck. Additionally, patient functionality will be evaluated five times through questionnaires.

Specifically, the timing of measurements will be: initially before the 1st session, before the 4th session, before the 8th session, and before the 12th session. Finally, patients will return 2 weeks after the end of the 12th session and 4 weeks after for the assessment of mid-term and long-term results.

Intervention Type
Other

Primary outcome(s)
The following primary outcome measures are assessed before the first, 4th, 8th, and 12th sessions, and 2 and 4 weeks after the end of the 12th session:
1. Pain intensity measured using a pain Visual Analog Scale (VAS)
2. Disability measured using the Neck Disability Index (NDI)

Key secondary outcome(s)
The following secondary outcome measures are assessed before the first, 4th, 8th, and 12th sessions, and 2 and 4 weeks after the end of the 12th session:
1. Craniovertebral angle (CVA) measured with photogrammetry
2. Sway posture angle measured with photogrammetry
3. Isometric muscle strength measured using hand-held dynamometry
4. Range of motion (ROM) measured with a goniometer
5. Psychological status assessed using the Beck Anxiety Inventory (BAI) and Beck Depression

Inventory (BDI) (validated Greek versions)
6. Health-related quality of life measured using the SF-36 questionnaire (Greek validated version)

Completion date
30/07/2025

Eligibility

Key inclusion criteria
1. Presence of sway back posture (pelvic angle <10°)
2. Pain lasting for more than 3 months

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
40 Years

Upper age limit
80 Years

Sex
All

Key exclusion criteria
1. Acute injuries to the neck, thoracic, or lumbar spine
2. Intervertebral disc herniation
3. Spondylolisthesis
4. Trauma or surgery to the spine
5. Associated neurological, musculoskeletal, or cognitive disorders
6. Vision problems
7. Use of medication
8. Grade 3 or 4 osteoarthritis

Date of first enrolment
30/10/2024

Date of final enrolment
30/05/2025

Locations

Countries of recruitment
Greece

Study participating centre
University of Patras
Therapeutic exercise and Sports Rehabilitation Lab
Rio
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Sponsor information

Organisation
University of Patras

ROR
https://ror.org/017wvtq80

Funder(s)

Funder type
University/education

Funder Name
University of Patras

Alternative Name(s)

Funding Body Type
Private sector organisation

Funding Body Subtype
Universities (academic only)

Location
Greece

Results and Publications

Individual participant data (IPD) sharing plan

The dataset generated and analyzed during this study will not be made publicly available due to concerns regarding patient confidentiality and privacy. However, the data will be securely stored in the University of Patras' Therapeutic Exercise and Sports Physiotherapy Lab, where it will remain accessible to authorized researchers involved in the study. Access to the dataset may be granted upon reasonable request, subject to approval by the study's ethics committee and in compliance with applicable data protection regulations.

IPD sharing plan summary

Stored in non-publicly available repository, Not expected to be made available