# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

10 Jun 2026

## Investigating the added effects of subscapularis muscle dry needling to exercise therapy on pain, kinematics, and cervical position sense in individuals with forward head posture

## Protocol summary


**Study aim**

Investigating the added effects of subscapularis muscle dry needling to exercise therapy on pain, kinematics, and cervical position sense in individuals with forward head posture

**Design**

Clinical trial, with a control group, double-blind, randomized, on 32 patients. A random number table is used for randomization, with 8 blocks and a block size of 4.

**Settings and conduct**

Two groups of subjects are selected from among those with head pronation. Subjects in one group receive exercise therapy and subjects in the other group receive dry needling of the subscapularis muscle in addition to exercise therapy. The examiner and the therapist are not the same, and thus blinding of the evaluator will be performed.

**Participants/Inclusion and exclusion criteria**

Inclusion criteria: Men and women between the ages of 18 and 50, craniovertebral angle less than 50 degrees, shoulder angle less than 52. Exclusion criteria: Having central nervous system problems, musculoskeletal problems, congenital neck problems, spondylolisthesis, taking any pharmacological or non-pharmacological treatment for neck pain and postural disorders, any mental disorder such as anxiety and depression, cancer and pregnancy, conditions that dry needling cannot be used

**Intervention groups**

In the intervention group, participants will receive dry needling of the subscapularis muscle along with exercise therapy, and in the control group, participants will receive exercise therapy alone. Both groups will undergo 10 treatment sessions, 3 sessions per week. The exercises for both treatment groups are the same and include stretching exercises and strengthening exercises. At the end of sessions one, three, five, seven, and nine, individuals will undergo dry needling of the subscapularis muscle. To perform dry needling (5 sessions), a Huan Qiu needle, 30 mm in diameter and 50 mm high, made in China, is used.

**Main outcome variables**

Craniovertebral angle, shoulder angle, pain, neck range of motion, neck position sense


## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20241004063260N2**
Registration date: **2025-04-02, 1404/01/13**
Registration timing: **prospective**

Last update: **2025-04-02, 1404/01/13**
Update count: **0**

**Registration date**

2025-04-02, 1404/01/13

**Registrant information**


**Name**

Farzaneh Yazdani

**Name of organization / entity**

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Iran (Islamic Republic of)

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**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2025-04-09, 1404/01/20

**Expected recruitment end date**

2025-10-12, 1404/07/20

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

Investigating the added effects of subscapularis muscle dry needling to exercise therapy on pain, kinematics, and cervical position sense in individuals with forward head posture

**Public title**

The effects of adding subscapularis muscle dry needling to exercise therapy on symptoms of individuals with forward head posture

**Purpose**

Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Women and men between the ages of 18 and 50 Craniovertebral angle less than 50 degrees Shoulder angle less than 52 degrees

**Exclusion criteria:**

Having central nervous system problems Having musculoskeletal problems Having congenital neck problems Having spondylolisthesis Taking any pharmacological or non-pharmacological treatment for neck pain and postural disorders Having any mental disorder such as anxiety and depression Cancer Pregnancy The patient's fear of needles The patient's reluctance and negative beliefs about this method The patient's inability to obtain consent (cognitive problems and advanced age) The patient has a medical emergency or acute medical condition The patient has lymphedema in a region or an organ The patient has severe neutropenia or thrombocytopenia

**Age**

From **18 years** old to **50 years** old

**Gender**

Both

**Phase**

N/A

**Groups that have been masked**

- Investigator
- Outcome assessor
- Data analyser
- Data and Safety Monitoring Board

**Sample size**

Target sample size: **32**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

The random allocation method in this study is permutation (block) randomization. Considering 8 blocks of 4 in two groups and adding individuals with an allocation ratio of 1:1 in each group, 32 patients are studied in two groups of 16. Randomization is performed using a random number table.

**Blinding (investigator's opinion)**

Double blinded

**Blinding description**

In this study, assessment and treatment are performed separately by two physiotherapists, with the assessing physiotherapist blinded to the participants' treatment. Also statistical analysis is performed by a statistician who is blinded to the participants' allocation to groups.

**Placebo**

Not used

**Assignment**

Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**

**Name of ethics committee**

Research Ethics Committees of Shiraz School of Rehabilitation Sciences

**Street address**

Ethics Committee, Vice President for Research, School of Rehabilitation Sciences, Shahid Doran Campus, after Amir-al-momenin Burn Hospital, Sadra Town Road

**City**

Shiraz

**Province**

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**Postal code**

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**Approval date**

2025-02-05, 1403/11/17

**Ethics committee reference number**

IR.SUMS.REHAB.REC.1403.011

## Health conditions studied

### 1

**Description of health condition studied**

Forward head posture

**ICD-10 code**

R29.3

**ICD-10 code description**

Abnormal posture

## Primary outcomes

### 1

**Description**

Craniovertebral angle

**Timepoint**

Before the start of the intervention, after the intervention and two weeks after the intervention

**Method of measurement**

The craniovertebral angle is the angle between two anatomical landmarks (the spinous process of the seventh cervical vertebra and the outer part of the tragus of the ear) that is examined with the Kinovea software.

## Secondary outcomes

### 1

**Description**

Shoulder angle

**Timepoint**

Before the intervention, after the intervention, and two weeks after the intervention

**Method of measurement**

The shoulder angle is the angle formed by the intersection between the horizontal line passing through the acromion and the line connecting the spinous process of the seventh cervical vertebra to the acromion, and is measured with the Kinovea software.

### 2

**Description**

Pain

**Timepoint**

Before the intervention, after the intervention, and two weeks after the intervention

**Method of measurement**

Visual Analogue Scale

### 3

**Description**

Cervical positioning sense

**Timepoint**

Before the intervention, after the intervention, and two weeks after the intervention

**Method of measurement**

Joint position error test

### 4

**Description**

Cervical range of motion

**Timepoint**

Before the intervention, after the intervention, and two weeks after the intervention

**Method of measurement**

Goniometry

## Intervention groups

### 1

**Description**

Intervention group: Dry needling of the subscapularis muscle combined with exercise therapy. Individuals in this group will undergo 10 sessions of treatment, 3 sessions per week. The exercises will include stretching and strengthening exercises, and at the end of sessions one, three, five, seven, and nine, individuals will undergo dry needling of the subscapularis muscle. To perform dry needling, the participant is asked to lie supine, with the shoulder in 90 degrees of abduction and 90 degrees of external rotation. The therapist uses one hand to pull the participant's shoulder further outward, palpating the outer edge of the scapula. The latissimus dorsi tendon is identified and lifted using a pincer grip to provide better access to the muscle. The needle is then inserted parallel to the chest and perpendicular to the anterior surface of the scapula. The needle entry site is cleaned with alcohol and cotton. Dry needling is performed on the muscle at three points, each point for 1 minute using a fast in-fast out method. A Chinese-made Huan Qiu needle, 30 mm in diameter and 50 mm in height, is used. Assessments will be conducted before treatment, immediately after treatment, and two weeks later.

**Category**

Treatment - Other

### 2

**Description**

Control group: Exercise therapy. Individuals in this group will undergo 10 sessions of therapy, 3 sessions per week. The exercises in this group are exactly the same as those in the intervention group and include stretching and strengthening exercises. Assessments will be conducted before treatment, immediately after treatment, and two weeks later.

**Category**

Treatment - Other

## Recruitment centers

### 1

**Recruitment center**

**Name of recruitment center**

Clinic of the Faculty of Rehabilitation Sciences, Shiraz University of Medical Sciences

**Full name of responsible person**

Farzaneh Yazdani

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## Sponsors / Funding sources

**1**

**Sponsor**
**Name of organization / entity**
Shiraz University of Medical Sciences
**Full name of responsible person**
Mohammad Hashem Hashempour
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Research and Technology Vice Chancellor, 7th floor, Shiraz University of Medical Sciences Central Building, Zand Street
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**Phone**
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**Email**
vcrdep@sums.ac.ir
**Grant name**
**Grant code / Reference number**
**Is the source of funding the same sponsor organization/entity?**
No
**Title of funding source**
Shiraz University of Medical Sciences
**Proportion provided by this source**
100
**Public or private sector**
Public
**Domestic or foreign origin**
Domestic
**Category of foreign source of funding**
*empty*
**Country of origin**
**Type of organization providing the funding**
Academic

## Person responsible for general inquiries

**Contact**
**Name of organization / entity**
Shiraz University of Medical Sciences
**Full name of responsible person**
Farzaneh Yazdani
**Position**
Assistant Professor
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Ph.D.
**Other areas of specialty/work**
Physiotherapy
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## Person responsible for scientific inquiries

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## Person responsible for updating data

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## Sharing plan

**Deidentified Individual Participant Data Set (IPD)**
Yes - There is a plan to make this available
**Study Protocol**
Yes - There is a plan to make this available
**Statistical Analysis Plan**
Yes - There is a plan to make this available
**Informed Consent Form**
Yes - There is a plan to make this available
**Clinical Study Report**
Yes - There is a plan to make this available
**Analytic Code**
Not applicable
**Data Dictionary**
Not applicable
**Title and more details about the data/document**
Data collection form including primary and secondary outcomes, informed consent form, and SPSS file
**When the data will become available and for how long**
After the publication of the study results
**To whom data/document is available**
Researchers working in academic and scientific institutions
**Under which criteria data/document could be used**
Only for recording information in scientific databases
**From where data/document is obtainable**
Correspondence with the project manager via email yazdani_far@sums.ac.ir
**What processes are involved for a request to access data/document**
Maximum one month after sending the request via email
**Comments**