Clinical Trial Protocol
Iranian Registry of Clinical Trials

06 Nov 2026

Comparing the effect of scapular stabilization exercises with neck stabilization exercises with feedback on pain, posture, muscle electromyography activity in people with forward head deformity and non-specific chronic neck pain.

Protocol summary

Study aim

ompare the effects of scapular versus neck stabilization exercises on pain, posture, and electromyographic muscle activity in individuals with forward head posture and chronic non-specific neck pain.

Design

Design & Sample: A simple randomized, non-blinded, phase 0 clinical trial with two intervention groups and one control group. It includes 36 females (aged 20–30) with mild-to-moderate chronic neck pain and forward head posture. Randomization will be performed using the Excel RAND function.

Settings and conduct

Conducted at Shahid Beheshti University, this study involves 36 females with mild-to-moderate neck pain and forward head posture. Interventions comprise 4 weeks of scapular or neck stabilization exercises (3 sessions/week, 40–50 min/session). Outcomes include pain (VAS), forward head angle (photogrammetry), and superficial muscle activity (sEMG).

Participants/Inclusion and exclusion criteria

Inclusion Criteria: Forward head angle 35–50°; BMI 18–25 kg/m²; mild-to-moderate chronic neck pain; no regular exercise in past 6 months; no history of surgery; not pregnant. Exclusion Criteria: Outside age range; unwillingness to participate; active limb or musculoskeletal injuries.

Intervention groups

The study includes two intervention groups performing either scapular or neck stabilization exercises (4 weeks, 3 sessions/week, 40–50 minutes/session). The control group will receive no intervention and maintain their usual daily activities.

Main outcome variables

Neck pain intensity; forward head posture angle; onset time and amplitude of superficial neck and scapular muscle electromyographic activitY

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20180605039983N1**
Registration date: **2026-07-04, 1405/04/13**
Registration timing: **prospective**

Last update: **2026-07-04, 1405/04/13**
Update count: **0**

Registration date

2026-07-04, 1405/04/13

Registrant information

Name
Mehdi Gheitasi
Name of organization / entity
University of Shahid Beheshti
Country
Iran (Islamic Republic of)
Phone
+98 21 2990 5839
Email address
m_gheitasi@sbu.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-07-11, 1405/04/20

Expected recruitment end date

2026-07-18, 1405/04/27

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparing the effect of scapular stabilization exercises with neck stabilization exercises with feedback on pain, posture, muscle electromyography activity in people with forward head deformity and non-specific chronic neck pain.

Public title

Comparison of the Effects of Scapular and Cervical Stabilizing Exercises in Individuals with Forward Head Posture and Neck Pain

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

forward head angle greater than 35 degrees and less than 50 degrees), Body Mass Index (BMI) of 18 to 25, Mild to moderate neck pain (3 to 7 on the VAS scale) No history of athletic activity in the past six months No history of surgery, injury, accident, fracture, or significant abnormalities in the upper extremity. Absence of pregnancy

Exclusion criteria:

Older and younger ages Presence of injury in body organs

Age

From **20 years** old to **30 years** old

Gender

Female

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **36**

Randomization (investigator's opinion)

Randomized

Randomization description

In this study, simple randomization method is used and the randomization unit is "individual". Random sequence is generated in Excel software using RAND function and MOD ROW function is used for grouping. In order to observe allocation concealment, each individual's allocation code is placed in illegible and sealed envelopes after being determined in Excel.

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Older and younger ages Unwillingness to participate in research Having damage to the organs

Street address

Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran

City

Tehran

Province

Tehran

Postal code

1983969411

Approval date

2026-02-10, 1404/11/21

Ethics committee reference number

IR.SBU.REC.1404.311

Health conditions studied

1

Description of health condition studied

Neck pain

ICD-10 code

M54.2

ICD-10 code description

Cervicalgia

Primary outcomes

1

Description

Measuring pain levels

Timepoint

Before the start of the intervention and four weeks later

Method of measurement

Participants will be asked to respond using the Visual Analog Scale (VAS), which rates pain intensity on a scale of 0 to 10. A score of 1–3 indicates mild pain, 4–7 indicates moderate pain, and 8–10 indicates severe pain.

2

Description

Measurement of forward head angle

Timepoint

Before the start of the intervention and four weeks later

Method of measurement

The participant will be asked to stand in a relaxed position and gaze at an imaginary point directly ahead. The examiner will then take a side-view photograph from a distance of 150 cm, following a five-second pause.

Subsequently, using online protractor software, the angle between the line passing through the spinous process of the seventh cervical vertebra and the tragus, and the line passing horizontally through the spinous process of the seventh cervical vertebra (the cranio-vertebral angle), will be measured.

3

Description
electromyography (sEMG)
Timepoint
Before the start of the intervention and four weeks later
Method of measurement
Surface electromyography (sEMG) of the dominant side upper/middle/lower trapezius, sternocleidomastoid, serratus anterior, and middle deltoid was recorded using Megawin software and analyzed via MATLAB. Electrode placement followed the SENIAM protocol and reference literature. For data normalization, Maximum Voluntary Isometric Contraction (MVIC) was performed in muscle-specific positions using three 5-second trials separated by standardized rest intervals to prevent fatigue, utilizing the middle 3 seconds for analysis. Participants performed 5 repetitions of controlled-speed scaption, and signals from the middle 3 repetitions were band-pass filtered (20-450 Hz), rectified, and normalized to MVIC to calculate muscle onset time and activation amplitude

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group:Scapular stabilization exercises will be performed for four weeks, three sessions per week, lasting 40–50 minutes per session. Outcome measures include pain intensity via the Visual Analog Scale (VAS), forward head posture angle via photogrammetry, and superficial muscle activity via surface electromyography (sEMG).
Category
Rehabilitation

2

Description
Intervention group: Neck stabilization exercises will be performed for four weeks, three sessions per week, lasting 40–50 minutes per session. Outcome measures include pain intensity via the Visual Analog Scale (VAS), forward head posture angle via photogrammetry, and superficial muscle activity via surface electromyography (sEMG).
Category
Rehabilitation

3

Description
Control group: During the study period, no intervention will be administered to the control group, and participants will continue their usual exercises. Additionally, the VAS scale will be used to measure pain levels, photogrammetry to assess forward head angle, and EMG equipment to measure superficial muscle activity.
Category
Rehabilitation

Recruitment centers

1

Recruitment center
Name of recruitment center
Sports Science Laboratory of Shahid Beheshti University
Full name of responsible person
Sirus Sheikhi
Street address
Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran
City
Tehran
Province
Tehran
Postal code
1983969411
Phone
+98 21 2243 1953
Email
m_gheitasi@sbu.ac.ir

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
The University of Shahid Beheshti
Full name of responsible person
Mehdi Gheitasi
Street address
Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran
City
Tehran
Province
Tehran
Postal code
1983969411
Phone
+98 21 2243 1953
Email
m_gheitasi@sbu.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor

organization/entity?
No
Title of funding source
The University of Shahid Beheshti
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
The University of Shahid Beheshti
Full name of responsible person
Mehdi Gheitasi
Position
Associate professor
Latest degree
Ph.D.
Other areas of specialty/work
sport injury and corrective exercises
Street address
Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran
City
Tehran
Province
Tehran
Postal code
1983969411
Phone
+98 21 2243 1953
Email
m_gheitasi@sbu.ac.ir

Person responsible for scientific inquiries

Contact
Name of organization / entity
The University of Shahid Beheshti
Full name of responsible person
Mehdi Gheitasi
Position
Associate professor
Latest degree
Ph.D.
Other areas of specialty/work
sport injury and corrective exercises
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Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran
City
Tehran
Province
Tehran
Postal code
1983969411
Phone
+98 21 2243 1953
Email
m_gheitasi@sbu.ac.ir

Person responsible for updating data

Contact
Name of organization / entity
The University of Shahid Beheshti
Full name of responsible person
Mehdi Gheitasi
Position
Associate professor
Latest degree
Ph.D.
Other areas of specialty/work
sport injury and corrective exercises
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Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran
City
Tehran
Province
Tehran
Postal code
1983969411
Phone
+98 21 2243 1953
Email
m_gheitasi@sbu.ac.ir

Sharing plan

Deidentified Individual Participant Data Set (IPD)
Undecided - It is not yet known if there will be a plan to make this available
Study Protocol
Undecided - It is not yet known if there will be a plan to make this available
Statistical Analysis Plan
Undecided - It is not yet known if there will be a plan to make this available
Informed Consent Form
Undecided - It is not yet known if there will be a plan to make this available
Clinical Study Report
Undecided - It is not yet known if there will be a plan to make this available
Analytic Code
Undecided - It is not yet known if there will be a plan to make this available
Data Dictionary
Undecided - It is not yet known if there will be a plan to make this available