

Clinical Trial Protocol

Iranian Registry of Clinical Trials

27 Jul 2026

The Effect of Diaphragmatic Breathing and Corrective Exercises on Pain and Neck Function in Radiologic Technologists with Upper Crossed Syndrome

Protocol summary

Study aim

Investigation of the effect of diaphragmatic and corrective exercises on neck pain and function in radiotechnologists with upper crossed syndrome

Design

This is a randomized, controlled, parallel-group clinical trial involving 36 patients. Participants will be allocated to one of the three groups using a simple randomization method, generated via the Randomizer software

Settings and conduct

This randomized controlled trial will be conducted at the Arak University laboratory. The target population consists of radi technologists suffering from Upper Crossed Syndrome. Both intervention groups will follow their respective exercise programs. Assessments will be performed at pre-test and post-test stages using the Visual Analogue Scale (VAS) and the Neck Disability Index (NDI).

Participants/Inclusion and exclusion criteria

Inclusion criteria: Clinical diagnosis of upper crossed syndrome by postural assessment and deep neck muscle weakness, age between 25 to 45 years, minimum 1 year of work experience as a radiotechnologist, chronic neck pain more than 3 months, pain intensity/disability: VAS $\geq$ 3 or NDI $\geq$ 10, provision of informed consent. Exclusion criteria: History of cervical spine or shoulder surgery, systemic/neurological/rheumatic diseases, acute respiratory or cardiovascular problems, pregnancy, participation in a similar exercise program in the last 3 months, use of other treatments during the study period

Intervention groups

Intervention group 1: Shoulder and scapular stabilization exercises Intervention group 2: Diaphragmatic breathing exercises Control group: No exercise intervention

Main outcome variables

Neck Pain Intensity

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20251121068065N12**

Registration date: **2026-07-03, 1405/04/12**

Registration timing: **prospective**

Last update: **2026-07-03, 1405/04/12**

Update count: **0**

Registration date

2026-07-03, 1405/04/12

Registrant information

Name

kavoushgaran kavoushgaran

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 915 718 4680

Email address

atiye.hesary@gmail.com

Recruitment status

recruiting

Funding source

Expected recruitment start date

2026-07-16, 1405/04/25

Expected recruitment end date

2026-10-17, 1405/07/25

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effect of Diaphragmatic Breathing and Corrective Exercises on Pain and Neck Function in Radiologic Technologists with Upper Crossed Syndrome

Public title

The Effect of Diaphragmatic Breathing and Corrective Exercises on Pain and Neck Function in Radiologic Technologists with Upper Crossed Syndrome

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Clinical diagnosis of Upper Crossed Syndrome (UCS) based on postural assessment (forward head, rounded shoulders), deep cervical flexor weakness, and validated clinical tests (e.g., Janda or observation-based tests). Age range: 25 to 45 years. Minimum of 1 year of professional experience as a radiotechnologist. Chronic neck pain (duration of more than 3 months). Pain intensity of VAS ≥ 3 and/or NDI score ≥ 10 . Informed consent to participate in the study.

Exclusion criteria:

History of cervical spine or shoulder surgery. Presence of systemic, neurological, or rheumatic diseases. Acute respiratory or cardiovascular disorders. Pregnancy. Participation in similar exercise programs within the last 3 months. Concurrent use of other therapeutic interventions (e.g., physiotherapy, chiropractic, or acupuncture) during the study period.

Age

From **25 years** old to **45 years** old

Gender

Both

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **36**

Randomization (investigator's opinion)

Randomized

Randomization description

Participants will be allocated to one of the three groups using simple randomization, facilitated by the Randomizer software. To ensure unbiased allocation, the random codes generated by the software will serve as the basis for assigning each participant to one of the three groups, ensuring a systematic and randomized distribution of participants across the study group.

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

Research Ethics Committees of Arak University

Street address

Arak University, Sardasht Blvd., Basij Sq., Arak, Iran.

City

Arak

Province

Markazi

Postal code

3818175846

Approval date

2026-02-25, 1404/12/06

Ethics committee reference number

IR.ARAKU.REC.1404.071

Health conditions studied

1

Description of health condition studied

Upper Crossed Syndrome (Cervicalgia)

ICD-10 code

M54.2

ICD-10 code description

Cervicalgia

Primary outcomes

1

Description

Neck Pain Intensity

Timepoint

Assessments will be conducted in two stages: pre-test (before the start of the exercise protocol) and post-test (after completion of the 8-week exercise period).

Method of measurement

Pain intensity will be measured using the Visual Analog Scale (VAS).

Secondary outcomes

1

Description

Neck function

Timepoint

Assessments will be conducted in two stages: pre-test (before the start of the exercise protocol) and post-test (after completion of the 8-week exercise period).

Method of measurement

Neck function will be assessed using the Neck Disability Index (NDI).

Intervention groups

1

Description

Intervention Group 1: (Shoulder Stabilization Exercises) consists of corrective stabilization exercises for the shoulder girdle and scapular muscles, performed for 8 weeks, three sessions per week, with each session lasting 30 to 45 minutes. The exercise content includes active exercises to strengthen scapular muscles (such as the serratus anterior and lower trapezius), balance and postural control exercises in sitting, standing, and quadruped positions, and functional exercises using resistance bands or body weight.

Category

Rehabilitation

2

Description

Intervention Group 2: (Diaphragmatic Breathing Exercises) consists of diaphragmatic breathing retraining, performed for 8 weeks, three sessions per week, with each session lasting 30 to 45 minutes. The exercise content includes training in deep diaphragmatic breathing in supine, sitting, and standing positions, breathing rhythm exercises, inhalation and exhalation control, and breathing exercises combined with upper limb movements.

Category

Rehabilitation

3

Description

Control group: Will not receive any exercise intervention.

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

University of Arak Laboratory

Full name of responsible person

Dr. Fakheri

Street address

Arak University, Sardasht Blvd., Basij Sq., Arak, Iran.

City

Arak

Province

Markazi

Postal code

3818175846

Phone

+98 86 3262 9024

Email

f-fakhri@araku.ac.ir

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Laya Dolatabadi Farahani

Full name of responsible person

Laya Dolatabadi Farahani

Street address

Arak University, Sardasht Blvd., Basij Sq., Arak, Iran.

City

Arak

Province

Markazi

Postal code

3818175846

Phone

+98 930 376 2537

Email

l.dolatabadi.03@msc.araku.ac.ir

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?

Yes

Title of funding source

Laya Dolatabadi Farahani

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

Arak University

Full name of responsible person

Shahnaz Sharjerdi

Position

Associate Professor

Latest degree

Ph.D.

Other areas of specialty/work

Sport Medicine

Street address

Arak University, Sardasht Blvd., Basij Sq., Arak, Iran.

City

Arak

Province

Markazi

Postal code

3818175846

Phone

+98 918 862 0643

Email

s-shahrjerdi@araku.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity

Arak University

Full name of responsible person

Shahnaz Sharjerdi

Position

Associate Professor

Latest degree

Ph.D.

Other areas of specialty/work

Sport Medicine

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Phone

+98 918 862 0643

Email

s-shahrjerdi@araku.ac.ir

Person responsible for updating data

Contact

Name of organization / entity

Arak University

Full name of responsible person

Laya Dolatabadi Farahani

Position

Student

Latest degree

Bachelor

Other areas of specialty/work

Sport Medicine

Street address

Arak University, Sardasht Blvd., Basij Sq., Arak, Iran.

City

Arak

Province

Markazi

Postal code

3818175846

Phone

+98 930 376 2537

Email

l.dolatabadi.03@msc.araku.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

Not applicable

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