Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 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 ≥ 3 or NDI ≥ 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)

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atiye.hesary@gmail.com

Recruitment status
Recruitment complete

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.

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Arak

Province
Markazi

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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

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

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Laya Dolatabadi Farahani

Full name of responsible person
Laya Dolatabadi Farahani

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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

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Latest degree

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Person responsible for updating data

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Student

Latest degree

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Other areas of specialty/work

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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