

Clinical Trial Protocol

Iranian Registry of Clinical Trials

11 Sep 2026

Comparison of the Effect of National Academy of Sports Medicine (NASM)-Based Corrective Exercises with and without Hamstring Stretching on Posture and Quality of Life in Dentists with Upper Crossed Syndrome

Protocol summary

Study aim

Comparison of the effects of two training methods based on the National Academy of Sports Medicine approach with and without hamstring stretching on the alignment and quality of life of dentists with upper crossed syndrome.

Design

randomized, controlled, parallel-group clinical trial

Settings and conduct

After selecting the subjects and confirming the presence of upper crossed syndrome and hamstring shortening, these individuals will be assigned to the intervention and control groups using a random block method and will receive the necessary therapeutic exercises under the supervision of the researcher in the rehabilitation center. Blinding will not be performed in this study.

Participants/Inclusion and exclusion criteria

Inclusion: Age range between 30 and 40 years and at least 3 years of dental work experience, have a body mass index of less than 30, have thoracic kyphosis angles above 42 degrees, head forward angle above 45 degrees, and shoulder forward angle above 52 degrees, and have a doctor's permission to participate in exercises and have hamstring shortness. Exclusion: similar corrective interventions in the past 6 months and a history of spinal surgery, presence of musculoskeletal diseases and medical problems

Intervention groups

Intervention group: In addition to the National Academy of Sports Medicine corrective exercises, which include restraint, lengthening, activation, and integration techniques, they also perform specific hamstring stretching exercises. The exercises are performed for 8 weeks, 3 sessions of 50 minutes each week. Control group: They only perform the National Academy of Sports Medicine corrective exercises without any hamstring stretching for 8 weeks, 3 sessions of 50

minutes each week.

Main outcome variables

Alignment(kyphosis angle, forward head angle, forward shoulder angle), quality of life

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20260322069009N1**

Registration date: **2026-05-22, 1405/03/01**

Registration timing: **prospective**

Last update: **2026-05-22, 1405/03/01**

Update count: **0**

Registration date

2026-05-22, 1405/03/01

Registrant information

Name

Parisa Shahrzad

Name of organization / entity

The University of Tehran

Country

Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-06-10, 1405/03/20

Expected recruitment end date

2026-06-20, 1405/03/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of the Effect of National Academy of Sports Medicine (NASM)-Based Corrective Exercises with and without Hamstring Stretching on Posture and Quality of Life in Dentists with Upper Crossed Syndrome

Public title

Comparison of two corrective exercise programs to improve the spine of dentists

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

They must have at least 3 years of dental practice experience Body Mass Index (BMI) less than 30 Having an abnormality with a chest kyphosis angle of 42 degrees or more, a head forward angle of 45 degrees or more, or a shoulder forward angle of 52 degrees or more Medical certificate attesting to the ability to perform light to moderate physical exercises. Shortening of the hamstring muscle, based on the straight leg raise test (SLR) (less than 80 degrees)

Exclusion criteria:

Presence of acute or chronic musculoskeletal diseases that prevent exercise History of spinal or upper extremity surgery that may affect ability to exercise Receiving similar corrective interventions (such as physiotherapy or corrective exercises) in the past 6 months

Age

From **30 years** old to **40 years** old

Gender

Both

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

In this study, researchers employ a block randomization method to assign patients to two distinct groups. The approach involves dividing patients into smaller blocks and then randomly allocating them to the main research groups (NASM exercises with hamstring stretching and NASM exercises without hamstring stretching). The goal is to balance the groups and minimize the impact of confounding variables on the research outcomes.

Implementation steps: Patient numbering: Each patient is assigned a unique identifier. Web application utilization: To facilitate randomization, a specialized web application named "Research Randomizer" is used. This tool automatically distributes patients into groups using random algorithms. Block division: Patients are divided

into 5 blocks of 6 individuals each. This is done to ensure balance within each block. Group assignment: Patients within each block are randomly assigned to groups A and B in sequence. The sequence is determined by the web application. Formation of main groups: Ultimately, patients from all blocks are combined, forming two main 15-person groups (NASM exercises with and without hamstring stretching)

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**

Ethics Committee, Faculty of Sport and Health Sciences, University of Tehran

Street address

opposite University of Tehran Dormitory (Kuy-e Daneshgah), Between 15th & 16th Streets, North Kargar Street, above Jalal-e-Ale Ahmad Intersection, Tehran

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1439813117

Approval date

2026-02-01, 1404/11/12

Ethics committee reference number

IR.UT.SPORT.REC.1404.231

Health conditions studied**1****Description of health condition studied**

Upper cross syndrome

ICD-10 code

M40.0

ICD-10 code description

Postural kyphosis

Primary outcomes**1****Description**

Kyphosis angle.

Timepoint

It is evaluated at the beginning of the research and after 8 weeks, that is, before and after the treatment.

Method of measurement

The kyphosis angle is measured using a flexible ruler.

2

Description

Forward head angle.

Timepoint

It is evaluated at the beginning of the research and after 8 weeks, that is, before and after the treatment.

Method of measurement

The forward angle of the head is done using the photogrammetry method (photographing from the side view).

3

Description

The forward shoulder angle.

Timepoint

It is evaluated at the beginning of the research and after 8 weeks, that is, before and after the treatment.

Method of measurement

The forward shoulder angle is done using the photogrammetric method (side view photography).

4

Description

Quality of Life.

Timepoint

It is evaluated at the beginning of the research and after 8 weeks, that is, before and after the treatment.

Method of measurement

Using Short Form Health Survey questionnaire (SF-36).

Secondary outcomes

empty

Intervention groups

1

Description

Intervention Group: In this group, in addition to the full implementation of the National Academy of Sports Medicine (NASM) corrective exercise protocol—which follows a specific structure and includes inhibitory, lengthening, activation, and integration techniques—dedicated hamstring stretching exercises will also be added to the training. These stretching exercises are designed to reduce hamstring tightness, which can indirectly affect posture and muscular balance in the posterior kinetic chain. The stretching exercises are incorporated into the lengthening phase and include static stretching held for 30 seconds, with three repetitions per leg. These stretches will be progressively adjusted based on the individual's flexibility. Close supervision of the correct execution of these stretches

will prevent injury and ensure the quality of the intervention. Each training session lasts 50 minutes and is performed three times per week for 8 weeks. The structure of each session includes 5 minutes of general warm-up (light aerobic movements and dynamic stretches), 40 minutes of main exercise, and 5 minutes of cool-down.

Category

Treatment - Other

2

Description

Control Group: The exercise intervention in this group will be designed and implemented based on the corrective exercise model of the National Academy of Sports Medicine (NASM). Each training session lasts 50 minutes and is performed three times per week for 8 weeks. The structure of each session includes 5 minutes of general warm-up (light aerobic movements and dynamic stretches), 40 minutes of main exercise, and 5 minutes of cool-down. The main exercise portion is delivered in four consecutive phases: (1) Inhibitory – using foam rollers for myofascial release of overactive muscles; (2) Lengthening – using static stretches for shortened muscles; (3) Activation – strengthening weak muscles with targeted resistance exercises; and (4) Integration – providing compound exercises to coordinate muscles in functional movement patterns. The exercise intensity is set at a low to moderate level, and the types of movements are specifically designed to address postural abnormalities resulting from upper crossed syndrome.

Category

Treatment - Other

Recruitment centers

1

Recruitment center

Name of recruitment center

Laboratory of Faculty of Physical Education and Sports Sciences, University of Tehran.

Full name of responsible person

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Sponsors / Funding sources

1

Sponsor

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Full name of responsible person

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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

The University of Tehran

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 Tehran

Full name of responsible person

Parisa Shahrzad

Position

Phd Student

Latest degree

Master

Other areas of specialty/work

Others

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Person responsible for updating data

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Full name of responsible person

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Latest degree

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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

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

Title and more details about the data/document

All data obtained from this research will be made freely and openly available to researchers and interested parties through academic databases and reputable scientific articles, after the anonymization of

participants.

When the data will become available and for how long

6 to 15 months after the publication of the results

To whom data/document is available

All researchers, therapists and specialists.

Under which criteria data/document could be used

With the aim of facilitating the improvement of the level of academic research and improving the treatment of patients by therapists, researchers and specialists.

From where data/document is obtainable

Parisa Shahrzad, Faculty of Physical Education, University of Tehran (Tehran - North Kargar St. - above Jalal Al Ahmad Intersection - between 15th and 16th St. - in front of Tehran University Koi). Email: Parisashahrzad@yahoo.com

What processes are involved for a request to access data/document

As soon as the scientific articles are published, all relevant findings and data that can help to advance research and improve treatment methods will be available to the scientific community.

Comments