

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 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)

##### Phone

+98 21 2241 2082

##### Email address

parisa.shahrzad1@ut.ac.ir

##### Recruitment status

**recruiting**

##### 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

**City**

Tehran

**Province**

Tehran

**Postal code**

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**

Hooman Minoonejad

##### **Street address**

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

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## Sponsors / Funding sources

### 1

#### Sponsor

**Name of organization / entity**

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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 scientific inquiries

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**Latest degree**

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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

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