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

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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
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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.
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1

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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
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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