

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

The Effect of Six Weeks of Ankle-Stretching Exercises on Achilles Tendon Stiffness, Anterior Knee Pain, Genu Recurvatum, Stride Length and Walking Speed in Children with Ankle pronation

Protocol summary

Study aim

To evaluate the effects of 6-week ankle stretching on Achilles tendon stiffness, anterior knee pain, genu recurvatum, and gait parameters in children with ankle pronation

Design

Semi-experimental, single-blind, randomized controlled trial, parallel groups (1:1), phase N/A (exercise therapy) on 40 children (6-10 years). Individual simple randomization via Excel (RAND and MOD ROW functions). Allocation concealment used sequentially numbered, opaque, sealed envelopes opened by an independent supervisor

Settings and conduct

Conducted at Shahid Beheshti University sports hall. 40 children randomly assigned to stretching (n=20) or control (n=20) groups. Intervention: 6 weeks of ankle stretching (3 sessions/week, 40 min/session). Control: routine activities. Tested at baseline and post-intervention. Blinding: Open-label (no blinding)

Participants/Inclusion and exclusion criteria

Children aged 6-10 years, Chronic anterior knee pain (WBFS score 4-6), dorsiflexion range of motion <10 degrees. New orthopedic injury during the intervention, Unwillingness to continue the study, Irregular attendance in training sessions.

Intervention groups

5 static stretching exercises targeting gastrocnemius and soleus muscles (5 sets, 15-60s hold, 1-min rest) for 6 weeks, totaling 40 min/session Received no specific stretching or therapeutic intervention during the 6-week study period and maintained their routine daily activities

Main outcome variables

Anterior knee pain; Achilles tendon stiffness (ankle dorsiflexion range of motion); Genu recurvatum angle

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20240306061185N7**

Registration date: **2026-06-09, 1405/03/19**

Registration timing: **prospective**

Last update: **2026-06-09, 1405/03/19**

Update count: **0**

Registration date

2026-06-09, 1405/03/19

Registrant information

Name

Hossein Rezaei

Name of organization / entity

The University of Shahid Beheshti

Country

Iran (Islamic Republic of)

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Recruitment status

Not yet recruiting

Funding source

Expected recruitment start date

2026-06-22, 1405/04/01

Expected recruitment end date

2026-07-06, 1405/04/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effect of Six Weeks of Ankle-Stretching Exercises on Achilles Tendon Stiffness, Anterior Knee Pain, Genu Recurvatum, Stride Length and Walking Speed in Children with Ankle pronation

Public title

Stretching Effects on Child Pronated Ankles

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Boys and girls aged 6 to 10 years Chronic and persistent anterior knee pain with a WBFS score of 4 to 6 Limited ankle dorsiflexion range of motion less than 10 degrees Ankle pronation confirmed by a Navicular Drop Test greater than 10 mm Genu recurvatum angle greater than 5 degrees

Exclusion criteria:

History of lower limb surgery, fractures, or severe orthopedic injuries within the past year Severe structural deformities or neuromuscular disorders in the lower extremities Previous physical therapy, exercise therapy, or medical injections for the ankle/knee within the past 6 months Use of orthopedic insoles or specialized corrective footwear at the study onset

Age

From **6 years** old to **10 years** old

Gender

Both

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **40**

Randomization (investigator's opinion)

Randomized

Randomization description

In this study, simple randomization method is used and the randomization unit is "individual". Random sequence is generated in Excel software using RAND function and MOD ROW function is used for grouping. In order to observe allocation concealment, each individual's allocation code is placed in illegible and sealed envelopes after being determined in Excel.

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Shahid Beheshti University Ethics Committee

Street address

Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran

City

Tehran

Province

Tehran

Postal code

1983969411

Approval date

2025-12-06, 1404/09/15

Ethics committee reference number

IR.SBU.REC.1404.249

Health conditions studied

1

Description of health condition studied

Anterior knee pain

ICD-10 code

M22.2X

ICD-10 code description

Patellofemoral disorders

2

Description of health condition studied

Ankle pronation

ICD-10 code

ICD-10 code description

3

Description of health condition studied

Genu recurvatum

ICD-10 code

ICD-10 code description

4

Description of health condition studied

Achilles tendon stiffness

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Anterior knee pain severity

Timepoint

Baseline and Six weeks post-intervention

Method of measurement

Wong-Baker Faces Pain Rating Scale

2

Description

Ankle dorsiflexion range of motion

Timepoint

Baseline and six weeks post-intervention

Method of measurement

goniometer

3

Description

Genu recurvatum angle

Timepoint

Baseline and six weeks post-intervention

Method of measurement

گونیا متر

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: Consisted of twenty children who performed a static stretching exercise protocol targeting the gastrocnemius and soleus muscles of the ankle. The program included five static stretching exercises, performed in five sets, with a holding duration of fifteen to sixty seconds and one minute of rest between sets. The exercises were conducted for six weeks, with a frequency of three sessions per week and a duration of forty minutes per session, under the direct supervision of the researcher in the sports hall

Category

Rehabilitation

2

Description

Control group: During the research period, there will be no intervention in the control group and they will continue with their usual exercises.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Sports Science Laboratory of Shahid Beheshti University

Full name of responsible person

Sirus Sheikhi

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

The University of Shahid Beheshti

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?

No

Title of funding source

The University of Shahid Beheshti

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 Shahid Beheshti

Full name of responsible person

Hossein Rezaei

Position

PhD student

Latest degree

Master

Other areas of specialty/work

sport injury and corrective exercises

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Person responsible for scientific inquiries**Contact****Name of organization / entity**

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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

Undecided - It is not yet known if there will be a plan to make this available

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