Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 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

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Recruitment status

Recruitment complete

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
گونیامتر

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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Shahid Beheshti University, Shahriari square, Volanjek Town, Tehran
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
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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
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Person responsible for updating data

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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