

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

14 Jul 2026

### The effect of different types of pedagogy (linear and nonlinear) on lower limb kinematics in walking motor skills in children: a preliminary study of injury prevention

#### Protocol summary

##### Study aim

The aim of this study is to investigate the effect of different pedagogy methods (linear and nonlinear) on lower limb kinematics in gait motor skill in children 3-5 years old.

##### Design

This clinical trial with control group will be performed on 36 children.

##### Settings and conduct

This research will be done in the Faculty of Physical Education of Kharazmi University. For this purpose, 36 children aged 3-5 years will be randomly divided into three groups (two exercise groups and one control group). Pre-test will be performed. Then the exercises will be performed for 6 weeks. Then the post-test will be done.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: Children aged 3-5 years with no history of lower limb injury and underlying disease will be randomly assigned to the intervention and control groups. Exclusion criteria: Children with physical and mental disorders will not participate in the study.

##### Intervention groups

Intervention group 1: Linear pedagogy. Intervention group 2: Nonlinear pedagogy. Control group 1: control. In intervention groups 1 and 2, children will receive a walking educational program for six weeks. In the control group, children will not participate in the educational program and will only participate in pre-test and post-test. - Training period: six weeks, - Number of training sessions per week: two sessions per week, - Duration of each training session: 30 minutes (5 minutes of warm-up, 20 minutes of the main body of the class which includes walking training, 5 minutes of cool-down will be performed in each session).

##### Main outcome variables

lower limb kinematics while walking, stride length.

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20130109012078N5**

Registration date: **2021-05-14, 1400/02/24**

Registration timing: **registered\_while\_recruiting**

Last update: **2021-05-14, 1400/02/24**

Update count: **0**

##### Registration date

2021-05-14, 1400/02/24

##### Registrant information

##### Name

Maryam Ghorbani

##### Name of organization / entity

Azad

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 6656 2382

##### Email address

maryamm\_ghorbani@yahoo.com

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2021-05-04, 1400/02/14

##### Expected recruitment end date

2021-07-05, 1400/04/14

##### Actual recruitment start date

empty

##### Actual recruitment end date

empty

##### Trial completion date

empty

**Scientific title**  
The effect of different types of pedagogy (linear and nonlinear) on lower limb kinematics in walking motor skills in children: a preliminary study of injury prevention

**Public title**  
Investigating the effect of pedagogy on gait pattern

**Purpose**  
Prevention

**Inclusion/Exclusion criteria**  
**Inclusion criteria:**  
children aged 3-5 years. without a history of injury and underlying disease. Ability to walk.  
**Exclusion criteria:**  
Children with physical and mental disorders.

**Age**  
From **3 years** old to **5 years** old

**Gender**  
Both

**Phase**  
N/A

**Groups that have been masked**  
*No information*

**Sample size**  
Target sample size: **36**

**Randomization (investigator's opinion)**  
Randomized

**Randomization description**  
By lottery, individuals are divided into intervention and control groups. The children's names are written on a piece of paper and placed in a box. The names are then randomly removed from the box. Then the first person in the linear group, the second person in the nonlinear group and the third person in the control group are placed and continue, respectively.

**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

Kharazmi University

##### Street address

Faculty of Physical Education & Sports Sciences of Kharazmi University, Mirdamad Ave, Tehran, Iran.

##### City

Tehran

**Province**  
Tehran

**Postal code**  
1571914911

**Approval date**  
2020-12-06, 1399/09/16

**Ethics committee reference number**  
IR.KHU.REC.1399.031

## Health conditions studied

### 1

#### Description of health condition studied

gait

#### ICD-10 code

Y93.0

#### ICD-10 code description

Activities involving walking and running

## Primary outcomes

### 1

#### Description

Kinematics of gait (angles of the lower extremity joints) in the sagittal plane

#### Timepoint

Measurements will be performed before and after the training intervention.

#### Method of measurement

Using GoPro Black 7 camera, children's gait will be recorded before and after the intervention. Using Kinovea software, the measurements of the joint angles of the lower extremity at the moment of heel contact with the ground and the moment of the big toe off from the ground will be calculated.

### 2

#### Description

stride length

#### Timepoint

Measurements will be performed before and after the training intervention.

#### Method of measurement

Using GoPro Black 7 camera, children's gait will be recorded before and after the intervention. Stride length will be calculated by using Kinovea software.

## Secondary outcomes

empty

## Intervention groups

### 1

#### Description

Intervention group1: linear pedagogy. In linear pedagogy, the child will first be presented with the correct gait pattern (verbally and with a visual pattern).

The child will then be asked to follow the specified path and at the same time the child will be given feedback. - Training period: six weeks, - Number of training sessions per week: two sessions per week, - Duration of each training session: 30 minutes (5 minutes of warm-up, 20 minutes of the main body of the class which includes walking training, 5 minutes of cool-down will be performed in each session).

#### Category

Prevention

### 2

#### Description

Intervention group 2: nonlinear pedagogy. In non-linear, each session will be designed according to the intended goals. The child will then be allowed to walk in the environment. - Training period: six weeks, - Number of training sessions per week: two sessions per week, - Duration of each training session: 30 minutes (5 minutes of warm-up, 20 minutes of the main body of the class which includes walking training, 5 minutes of cool-down will be performed in each session).

#### Category

Prevention

### 3

#### Description

Control group: control. The control group will not receive training for six weeks. They will only take the pre-test and post-test.

#### Category

Prevention

## Recruitment centers

### 1

#### Recruitment center

##### Name of recruitment center

Lena School and Kindergarten

##### Full name of responsible person

Maryam Ghorbani

##### Street address

No. 14., at the beginning of Roshnaei St, North Kaveh Boulevard, Sadr Highway, Tehran.

##### City

Tehran

##### Province

Tehran

##### Postal code

1318835835

##### Phone

+98 21 2220 0989

##### Email

maryamm\_ghorbani@yahoo.com

## Sponsors / Funding sources

### 1

#### Sponsor

##### Name of organization / entity

kharazmi University

##### Full name of responsible person

Dr. Hamid Rajabi

##### Street address

Faculty of Physical Education & Sports Sciences of Kharazmi University, Mirdamad Ave, Tehran, Iran.

##### City

Tehran

##### Province

Tehran

##### Postal code

1571914911

##### Phone

+98 21 8832 9220

##### Email

hrajabi@khu.ac.ir

#### Grant name

#### Grant code / Reference number

#### Is the source of funding the same sponsor organization/entity?

Yes

#### Title of funding source

kharazmi University

#### 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

kharazmi University

##### Full name of responsible person

maryam ghorbani

##### Position

student

##### Latest degree

Master

##### Other areas of specialty/work

Motor behavior

##### Street address

No. 27., Deilman Str, Nofalah Str, Azadi St., Tehran.

##### City

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##### Province

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1313886873

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+98 21 6656 2382

##### Email

## Person responsible for scientific inquiries

### Contact

**Name of organization / entity**

kharazmi University

**Full name of responsible person**

Rasoul Yaali

**Position**

University Assistant Professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

motor behavior

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## Person responsible for updating data

### Contact

**Name of organization / entity**

kharazmi University

**Full name of responsible person**

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**Position**

student

**Latest degree**

Master

**Other areas of specialty/work**

motor behavior

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**Email**

maryamm\_ghorbani@yahoo.com

## 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**

Not applicable

**Data Dictionary**

Not applicable

**Title and more details about the data/document**

Data on walking kinematics, stride length, and static balance before and after the intervention will provided to the audience.

**When the data will become available and for how long**

September 2021

**To whom data/document is available**

Students and university professors

**Under which criteria data/document could be used**

This trial will be published in the form of a master's thesis.

**From where data/document is obtainable**

One should refer to the library of Kharazmi University.

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

Students will go to the library and receive a thesis file from the librarian.

**Comments**