

Clinical Trial Protocol

Iranian Registry of Clinical Trials

05 Aug 2026

The effects of backpack and modified pack carriage in different weights on posture, kinematics and kinetics of gait in schoolchildren

Protocol summary

Study aim

The aim was investigating and comparison of posture, kinematic and kinetic of during walking and carrying backpack and modified pack (with three bags that distribute the load equally in front and back of trunk) in 7.5, 10, 12.5, and 15 percent of body weight, in two heights of placement only in the 10% load, among 8 - 11 years old schoolboys.

Design

Within group comparison of eleven times randomized (repeated) measuring for each participant, Single blind

Settings and conduct

Location: Tehran city, motor control laboratory of electrical and computer faculty, university of Tehran.
Method: Each participant in one day, walked on Gaitway treadmill, while carrying backpack and modified pack with four different weights. At the end of each trial, then, the data recording was done. All randomized measurements (11 trials) were saved with a code then later calculations and analysis would be done. After calculations, trials would be arranged according to the primary list. Thus researcher and measurer didn't know how the measurements arrangement are, and each file of data is related to which trial, till the end of process.

Participants/Inclusion and exclusion criteria

Inclusion criteria: 1. The age ranged from 8 to 11 years; 2. Male gender; 3. The subject and his parent's consent; 4. Right hand and foot dominancy. Exclusion criteria: Any condition affecting on gait and carrying packs by participants.

Intervention groups

Two types of packs; Four different load for each one of packs; Two position of each pack only in 10% of body weight load.

Main outcome variables

Postural parameters including craniovertebral angle, trunk forward lean, hip and knee angle; Vertical ground reaction force parameters including first and second peaks, loading rate, support phase peak; Kinematical

parameters of gait including stride length, step width, double support time, cadence, swing phase time,

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20180607039995N1**

Registration date: **2020-04-28, 1399/02/09**

Registration timing: **retrospective**

Last update: **2020-04-28, 1399/02/09**

Update count: **0**

Registration date

2020-04-28, 1399/02/09

Registrant information

Name

Ali Akbar Jadidian

Name of organization / entity

Payamenoor university

Country

Iran (Islamic Republic of)

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+98 21 2237 3644

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2018-05-27, 1397/03/06

Expected recruitment end date

2018-07-22, 1397/04/31

Actual recruitment start date

2018-06-09, 1397/03/19

Actual recruitment end date

2018-08-05, 1397/05/14

Trial completion date
2018-08-05, 1397/05/14

Scientific title
The effects of backpack and modified pack carriage in different weights on posture, kinematics and kinetics of gait in schoolchildren

Public title
Effect of the carriage of tow types of pack on schoolchildren

Purpose
Other

Inclusion/Exclusion criteria
Inclusion criteria:
The age ranged from 8 to 11 Male gender The subject and his parent's consent Right hand and foot dominance
Exclusion criteria:
pain and injury within 6 months leading to measurement obesity with a BMI of over 30 history of chronic diseases postural and walking abnormalities such as flat foot drug intake fever within 72 hours leading up to measurement severe vision and hearing impairment history of surgery

Age
From **8 years** old to **11 years** old

Gender
Male

Phase
N/A

Groups that have been masked

- Investigator
- Outcome assessor
- Data analyser

Sample size
Target sample size: **30**
More than 1 sample in each individual
Number of samples in each individual: **11**
Each participant will be evaluated for 11 times. First is walking without backpack and load as control. 4 times is carrying conventional backpack in different weights (7/5, 10, 12/5, 15 percent of body weight). 4 times is carrying modified backpack in mentioned same weights. The 2 remained is carrying every pack with 10% weight at mid-back position.
Actual sample size reached: **28**
More than 1 sample in each individual
Actual sample size in each individual: **11**
Each participant was evaluated for 11 times. First was walking without backpack and load as control. 4 times was carrying conventional backpack in different weights (7/5, 10, 12/5, 15 percent of body weight). 4 times was carrying modified backpack in mentioned same weights. The 2 remained was carrying every pack with 10% weight at mid-back position.

Randomization (investigator's opinion)
N/A

Randomization description

Blinding (investigator's opinion)
Single blinded

Blinding description

Prior to measurement, each participant's data sheet was coded without specification, and all measurement interventions were randomly assigned to each participant in the sheet and each intervention was numbered. Each number is issued by the technician of the device, respectively. Therefore, the researcher and evaluator and data analyzer until the end of the analysis process in SPSS is unaware from the nature of the data and their relationship to the repetition.

Placebo
Not used

Assignment
Crossover

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics committee of physical education and sports science faculty, university of tehran
Street address
physical education and sports science faculty of university of tehran, AmirAbad, North Kargar
City
Tehran
Province
Tehran
Postal code
1439813117
Approval date
2018-05-29, 1397/03/08
Ethics committee reference number
IR.UT.SPORT.REC.1397.002

Health conditions studied

1

Description of health condition studied
Backpack, modified pack, gait, posture, kinetics, kinematics, pack position
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
postural parameters
Timepoint
one time, while applying independent variable
Method of measurement
Panasonic camera, NV-GS75

2

Description

Vertical ground reaction force

Timepoint

one time, while applying independent variable

Method of measurement

H/P/Cosmos Gaitway

3

Description

Spatiotemporal parameters of gait

Timepoint

one time, while applying independent variable

Method of measurement

H/P/Cosmos Gaitway

Secondary outcomes

empty

Intervention groups

1

Description

Control group: walking no load on level surface

Category

Prevention

2

Description

Intervention group: walking while carrying a backpack with 7.5% of body weight load.

Category

Prevention

3

Description

Intervention group2: walking while carrying a backpack with 10% of body weight load.

Category

Prevention

4

Description

Intervention group3: walking while carrying a backpack with 12.5% of body weight load.

Category

Prevention

5

Description

Intervention group4: walking while carrying a backpack with 15% of body weight load.

Category

Prevention

6

Description

Intervention group5: walking while carrying a modified pack with 7.5% of body weight load.

Category

Prevention

7

Description

Intervention group6: walking while carrying a modified pack with 10% of body weight load.

Category

Prevention

8

Description

Intervention group7: walking while carrying a modified pack with 12.5% of body weight load.

Category

Prevention

9

Description

Intervention group8: walking while carrying a modified pack with 15% of body weight load.

Category

Prevention

10

Description

Intervention group9: walking while carrying a backpack with 10% of body weight load, on thoracic position

Category

Prevention

11

Description

Intervention group10: walking while carrying a modified pack with 10% of body weight load, on thoracic position

Category

Prevention

Recruitment centers

1

Recruitment center

Name of recruitment center

Motor control laboratory, electrical and computer engineering faculty of university of Tehran

Full name of responsible person

Dr Fariba Bahrami_

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15th street, North Kargar street

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Physical Education and Sports Science, University of Tehran
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

Physical Education and Sports Science, 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
university of tehran
Full name of responsible person
Ali Akbar Jadidian
Position
Lecturer, Payame-noor
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Sharing plan

Deidentified Individual Participant Data Set (IPD)

No - There is not a plan to make this available

Justification/reason for indecision/not sharing IPD

There is no need to publish IPD in this study.

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

The mean and standard deviation of demographic information, and all data will publish as thesis and original article. There is no need to publish more than these.

When the data will become available and for how long

After submitting the thesis, 2019

To whom data/document is available

It will be free after publishing the thesis and article.

Under which criteria data/document could be used

After publish, it will be free with referencing.

From where data/document is obtainable

University of Tehran to achieve and reading full text of the thesis, and after publishing the articles, by searching in related scientific databases.

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

There is no other kind of request to achieve more information.

Comments