# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

08 Nov 2026

## The Effects of Proprioceptive Training on a BOSU Ball on Balance, Agility, Landing Error, and Ankle Joint Proprioception in Male Karate Kata Athletes

## Protocol summary

**Study aim**
The aim of this study is to investigate the effect of six weeks of BOSU ball proprioceptive training on static balance, dynamic balance, agility, landing error, and ankle proprioception in male karate athletes aged 18–25 years.

**Design**
Clinical trial with control group, with parallel group, single blinded

**Settings and conduct**
assessments will be conducted at the Sports Rehabilitation Laboratory of Bu-Ali Sina University. Participants will be randomly assigned to the intervention and control groups. The intervention will be performed in the university sports hall. This study will be conducted as a single-blind trial, in which the outcome assessor will be unaware of participants' group allocation and will perform all assessments and data recording without knowledge of group assignments.

**Participants/Inclusion and exclusion criteria**
Inclusion Criteria: Male karate athletes aged 18–25 years with at least one year of regular karate training experience, good general health status, no cardiovascular, neurological, or balance disorders affecting performance, no history of severe ankle sprain, lower-extremity fracture, or surgery within the previous six months, no acute lower-extremity pain at the time of assessment, and no use of ankle brace or orthosis. Exclusion Criteria: Occurrence of any musculoskeletal injury during the study, failure to comply with the training protocol or complete the assessments, absence from training sessions, initiation of a specific rehabilitation program, use of anti-inflammatory medications or drugs affecting motor performance and balance, use of an ankle brace or orthosis during the study, and diagnosis of a neuromuscular, balance-related, or cardiovascular disorder during the study.

**Intervention groups**
Proprioceptive training group, control group

**Main outcome variables**
Ankle proprioception, static balance, dynamic, Balance, agility, Landing error

## General information

**Reason for update**

**Acronym**

**IRCT registration information**
IRCT registration number: **IRCT20260620069887N2**
Registration date: **2026-06-27, 1405/04/06**
Registration timing: **prospective**

Last update: **2026-06-27, 1405/04/06**
Update count: **0**

**Registration date**
2026-06-27, 1405/04/06

**Registrant information**

**Name**
Raziyeh Taheri

**Name of organization / entity**
Bu-ali sina-hamedan

**Country**
Iran (Islamic Republic of)

**Phone**
+98 81 3323 2831

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r.taheri@phe.basu.ac.ir

**Recruitment status**
**Recruitment complete**

**Funding source**

**Expected recruitment start date**
2026-07-04, 1405/04/13

**Expected recruitment end date**

2026-07-25, 1405/05/03

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

The Effects of Proprioceptive Training on a BOSU Ball on Balance, Agility, Landing Error, and Ankle Joint Proprioception in Male Karate Kata Athletes

**Public title**

The Effect of Proprioceptive Training on Lower Extremity Functional Performance in Male Karate Athletes

**Purpose**

Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Male karate athletes aged 18–25 years At least one year of regular karate training experience No cardiovascular, neurological, or balance disorders affecting performance No history of severe ankle sprain, lower-extremity fracture, or surgery within the previous six months No history of severe ankle sprain, lower extremity fracture, or surgery in the past six months No use of ankle brace o r orthosis during the study period

**Exclusion criteria:**

Occurrence of any musculoskeletal injury during the study Failure to comply with the training protocol or complete assessments Absence from the prescribed training sessions Initiation of a specific rehabilitation program during the study Use of anti-inflammatory medications or drugs affecting motor performance and balance Diagnosis of a neuromuscular, balance-related, or cardiovascular disorder during the study

**Age**

From **18 years** old to **25 years** old

**Gender**

Male

**Phase**

N/A

**Groups that have been masked**

- Outcome assessor

**Sample size**

Target sample size: **40**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

Following participant recruitment and baseline assessment, eligible participants will be randomly assigned to the intervention or control group using Random Number Generator software. Allocation will be performed in a 1:1 ratio.

**Blinding (investigator's opinion)**

Single blinded

**Blinding description**

This study will be conducted as a single-blind trial. The outcome assessor will be blinded to group allocation and will perform all baseline and post-intervention assessments without knowledge of participants' group assignments.

**Placebo**

Not used

**Assignment**

Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**

**Name of ethics committee**

Ethics committee of Bu Ali Sina University

**Street address**

Modares Town, Abu Taleb Street, Bu Ali Sina University

**City**

hamedan

**Province**

Hamadan

**Postal code**

3869565178

**Approval date**

2026-04-18, 1405/01/29

**Ethics committee reference number**

IR.BASU.REC.1405.007

## Health conditions studied

### 1

**Description of health condition studied**

Healthy karate athletes

**ICD-10 code**

Z00.8

**ICD-10 code description**

Encounter for other general examination

## Primary outcomes

### 1

**Description**

Static balance

**Timepoint**

Before the intervention begins, One day after the end of the intervention

**Method of measurement**

Static balance will be assessed using the 20-second single-leg stance test based on the number of balance errors.

### 2

**Description**

Dynamic balance

**Timepoint**
Before the intervention begins, One day after the end of the intervention
**Method of measurement**
Dynamic balance will be assessed using the Y Balance Test based on the maximum reach distance in different directions.

**3**

**Description**
Agility
**Timepoint**
Before the intervention begins, One day after the end of the intervention
**Method of measurement**
Agility will be assessed using the T-test based the time required to complete the test in seconds.

**4**

**Description**
Landing error
**Timepoint**
Before the intervention begins, One day after the end of the intervention
**Method of measurement**
Landing error will be assessed using the Landing Error Scoring System(LEES) based on the landing error score.

**5**

**Description**
Ankle Proprioception
**Timepoint**
Before the intervention begins, One day after the end of the intervention
**Method of measurement**
Ankle proprioception will be assessed using the joint position reproduction test at 10 degree of dorsiflexion based on the angular repositioning error measured by a goniometer.

## Secondary outcomes

empty

## Intervention groups

**1**

**Description**
Intervention group: Proprioceptive exercises on the Basu-ball, Participants will perform a Bosu-Ball–based proprioceptive training program for 6 weeks, consisting of 3 sessions per week, with each session lasting 60 minutes. Each session will include 10 minutes of warm-up, approximately 45 minutes of progressive proprioceptive exercises (including double-leg and single-leg balance tasks, weight-shifting exercises, squats, lunges, and functional exercises performed on the Bosu-Ball with gradually increasing difficulty), followed by 5 minutes of cool-down. All training sessions will be conducted under the supervision of the researcher.
**Category**
Prevention

**2**

**Description**
Control group: Participants in the control group will not receive the Bosu-Ball–based proprioceptive training intervention during the 6-week study period and will continue their usual daily activities and routine football training.
**Category**
Other

## Recruitment centers

**1**

**Recruitment center**
**Name of recruitment center**
Hamadan Province Sports Directorate
**Full name of responsible person**
Ali Albakirat
**Street address**
Modares Town, Abu Taleb Street, Bu Ali Sina University
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## Sponsors / Funding sources

**1**

**Sponsor**
**Name of organization / entity**
Bu Ali Sina University
**Full name of responsible person**
Farzane Saki
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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**
Bu Ali Sina 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**
Bu Ali Sina University
**Full name of responsible person**
Ali Albakirat
**Position**
Student
**Latest degree**
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Sport Rehabilitation
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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