Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The Comparative Effects of Myofascial Release Exercises with and without muscle Energy Technique on Selected Musculoskeletal Variables in Taekwondo Athletes with Dynamic Knee Valgus

Protocol summary

Study aim

The Comparative Effects of Myofascial Release Exercises with and without muscle Energy Technique on Selected Musculoskeletal Variables in Taekwondo Athletes with Dynamic Knee Valgus

Design

A single-blind, randomized controlled clinical trial with parallel groups will be conducted on 60 participants. Randomization will be performed using Randomizer.org.

Settings and conduct

Participants will be recruited through advertisements posted at sports clubs in Karaj. After meeting the inclusion criteria and completing the informed consent form, they will be randomly assigned to three groups. The interventions will be conducted for 8 weeks (3 sessions per week), and post-tests will be performed using the same tools and procedures as the pre-tests.

Participants/Inclusion and exclusion criteria

Inclusion Criteria: Females aged 14–18 years with knee valgus >12° in SLL, ≥3 years of sports experience, and ≥3 weekly training sessions; no recent lower-limb injury, alignment-altering surgery, musculoskeletal disorders, neurological diseases, osteoarthritis, or hearing/visual impairments. Exclusion Criteria: Non-cooperation in assessments, incomplete intervention, >3 absences or 2 consecutive absences, pain or injury, or withdrawal.

Intervention groups

Experimental 1: SMFR using a foam roller for 8 weeks (3 sessions/week), with 10 repetitions over 2 minutes per muscle group on both lower limbs, under researcher supervision. Experimental 2: SMFR combined with MET for 8 weeks (3 sessions/week). involves 5–7-second isometric contractions at less than 20% MIVC, followed by relaxation and 5–30 seconds of stretching for 3–5 cycles. Control Group: No specific exercise intervention.

Main outcome variables

1.Dynamic Knee Valgus (DKV) Angle 2.Dynamic Balance 3.Static Balance 4.Landing Error Score 5.Hip Abduction Range of Motion (ROM) 6.Knee Joint Position Sense Error

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20260930071240N1**
Registration date: **2026-11-15, 1405/08/24**
Registration timing: **prospective**

Last update: **2026-11-15, 1405/08/24**
Update count: **0**

Registration date

2026-11-15, 1405/08/24

Registrant information

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Recruitment status

recruiting

Funding source

Expected recruitment start date

2026-11-18, 1405/08/27

Expected recruitment end date

2026-11-23, 1405/09/02

Actual recruitment start date

empty

Actual recruitment end date
empty
Trial completion date
empty

Scientific title
The Comparative Effects of Myofascial Release Exercises with and without muscle Energy Technique on Selected Musculoskeletal Variables in Taekwondo Athletes with Dynamic Knee Valgus

Public title
The Comparative Effects of Myofascial Release Exercises with and Without Muscle Energy Technique on Selected Musculoskeletal Variables in Taekwondo Athletes with Altered Knee Movement Patterns
Purpose
Prevention
Inclusion/Exclusion criteria
Inclusion criteria:
Females aged 14–18 years Knee valgus angle greater than 12 degrees during the Single-Leg Landing (SLL) test At least 3 years of sports training experience Participation in a regular training program (at least 3 training sessions per week) No history of lower-extremity injuries within the previous 6 months that resulted in functional or structural limitations No history of lower-extremity surgery that altered normal alignment No musculoskeletal disorders involving the spine or upper extremities No neurological disorders, osteoarthritis, or hearing or visual impairments
Exclusion criteria:
Failure to cooperate during the pre-test or post-test assessments Failure to complete the training program for any reason Absence from more than three training sessions or two consecutive sessions Development of pain or injury during the training sessions Unwillingness to continue participation in the study
Age
From **14 years** old to **18 years** old
Gender
Female

Phase
N/A
Groups that have been masked

- Data analyser

Sample size
Target sample size: **60**
Randomization (investigator's opinion)
Randomized
Randomization description
The randomization method will be web-based. Subjects who meet the study entry criteria will be randomly assigned to the first experimental group, the second experimental group, and the control group using the web-based randomization method (Social Psychology Network, Connecticut, USA) www.randomizer.org. The randomization will be simple. Concealment of random allocation will be done using a computer-generated block randomization table, where the number 1 will be defined for the self-myofascial release exercises group, the number 2 for the self-myofascial release exercises combined with Muscle Energy Technique group, and the number 3 for the control group. Then, the random number sequence will be placed in opaque and sealed envelopes. Also, according to the group assignments, the intervention will be continued by the researcher.
Blinding (investigator's opinion)
Single blinded
Blinding description
Participants, after reviewing the consent form in a 30-40minute session, are informed about the study groups and participate willingly in this study without having the permission to choose a group. The patients' names are randomly divided into three equal groups by a person unaware of the individuals' identity and physical characteristics, using the website http://randomizer.org, and each part is placed separately in sealed envelopes. Then, each individual receives the corresponding training and exercises according to their assigned group. The analyst and outcome evaluator, without being aware of the hypotheses, study methods, and patients' characteristics, examines and compares the changes before and after eight weeks.
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics Committee of Islamic Azad University Karaj branch
Street address
Karaj Branch, Islamic Azad University, Mo'azen Boulevard, Rajai Shahr, Karaj City Alborz Province
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Province
Alborz
Postal code
3149968111
Approval date
2026-10-27, 1405/08/05
Ethics committee reference number
IR.IAU.K.REC.1405.132

Health conditions studied

1

Description of health condition studied
Dynamic Knee Valgus
ICD-10 code

M21.069

ICD-10 code description

Valgus deformity, not elsewhere classified, unspecified knee

Primary outcomes

1

Description

Dynamic Knee Valgus Angle

Timepoint

Before and after the intervention

Method of measurement

Dynamic knee valgus (DKV) will be measured using the Single-Leg Landing Test and digital video recording in the frontal plane. The camera will be positioned at the participant's knee height and 230 cm from the landing area. Participants will jump down from a 30-cm-high box and land on their dominant leg at a distance of 30 cm from the box. Three successful trials will be recorded for each participant, and the mean angle will be calculated using Kinovea software. The angle will be measured at the point of maximum knee flexion. The angle will be calculated based on the anatomical landmarks of the ASIS, patellar center, and ankle joint center. Participants with a knee valgus angle greater than 12 degrees will be considered to have dynamic knee valgus.

2

Description

Static balance

Timepoint

Before and after the intervention

Method of measurement

Static balance will be assessed using the Bass-Stick Test. In this test, participants will be required to maintain balance on their dominant leg on a wooden block measuring 2.5 cm in width for 60 seconds without touching the ground. The test will be performed three times, and the best performance will be recorded as the static balance score.

3

Description

Dynamic balance

Timepoint

Before and after the intervention

Method of measurement

Dynamic balance will be assessed using the Y-Balance Test (YBT). The participant will stand barefoot on their dominant leg at the center of the YBT device and reach as far as possible with the contralateral leg in three directions: anterior (ANT), posteromedial (PM), and posterolateral (PL). Three valid trials will be recorded in each direction. Before the test, lower limb length will be measured as the distance between the anterior superior iliac spine (ASIS) and the medial malleolus. The mean reach distances in each direction will be calculated and normalized to lower limb length. Finally, the composite dynamic balance score will be calculated based on the mean reach distances in the three directions and lower limb length.

4

Description

Range of motion hip abduction

Timepoint

Before and after the intervention

Method of measurement

Hip abduction range of motion will be measured using a goniometer. The participant will lie in a supine position with the knees extended and the hip in a neutral position. The center of the goniometer will be placed over the anterior superior iliac spine (ASIS) of the limb being assessed. The stationary arm will be aligned with the imaginary line connecting both ASIS landmarks, while the movable arm will be aligned with the anterior midline of the femur, using the center of the patella as a reference point. The lower limb will then be passively moved into abduction until the first resistance or onset of compensatory movements is observed. Compensatory movements include displacement of the contralateral ASIS or lateral trunk flexion. The range of motion will be recorded in degrees at this point.

5

Description

Landing Error

Timepoint

Before and after the intervention

Method of measurement

Landing errors will be assessed using the Landing Error Scoring System (LESS) during the Drop Vertical Jump (DVJ) task. The participant will stand on a 30-cm-high box and jump forward, landing at a distance equal to half of their body height from the box, followed immediately by a maximum vertical jump. Two digital cameras will be positioned in front of and to the right side of the participant to record the movement in the frontal and sagittal planes. LESS assessment will be performed by analyzing the recorded videos, focusing on the dominant leg. The system consists of 17 assessment items evaluating foot and trunk positions, lower-limb movements, knee valgus, and movement patterns in the frontal and sagittal planes. The total score ranges from 0 to 17, with a score of 5 or higher indicating poor landing technique and a score below 5 indicating good landing technique.

6

Description

Knee Joint Position Sense Error

Timepoint

Before and after the intervention

Method of measurement

Knee joint position sense error will be measured using a goniometer and the passive-active repositioning method in a non-weight-bearing position. Participants will sit on the edge of an examination table with their eyes closed.

Initially, the knee joint will be passively positioned at 30 degrees of flexion and then returned to full extension. Participants will then be asked to actively reproduce the target position of 30 degrees of knee flexion. The difference between the target angle and the reproduced angle will be recorded as the knee joint position sense error. The test will be repeated five times, and the mean of the five measurements will be used for statistical analysis.

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group1: Self myofascial release using a foam roller for 8 weeks (3 sessions/week), with 10 repetitions over 2 minutes per muscle group on both lower limbs, under researcher supervision.
Category
N/A

2

Description
Intervention group2: SMFR combined with MET for 8 weeks (3 sessions/week). MET involves 5–7-second isometric contractions at less than 20% MIVC, followed by relaxation and 5–30 seconds of stretching for 3–5 cycles.
Category
N/A

3

Description
Control group: No specific exercise intervention.
Category
N/A

Recruitment centers

1

Recruitment center
Name of recruitment center
Islamic Azad University Karaj Branch
Full name of responsible person
Vahid Mazloum
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Sponsors / Funding sources

1

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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
Islamic Azad University
Proportion provided by this source
100
Public or private sector
Private
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
Islamic Azad University
Full name of responsible person
Vahid Mazloum
Position
Assistant Professor
Latest degree
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Sharing plan

Deidentified Individual Participant Data Set (IPD)
Yes - There is 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

Title and more details about the data/document
The data related to the subjects of the control and intervention groups in the pre-test and post-test are shared in an unidentifiable way.

When the data will become available and for how long
Six months after the publication of articles

To whom data/document is available
All researchers

Under which criteria data/document could be used
There is no obstacle to using data for citation, by mentioning the source.

From where data/document is obtainable
Vahid.mazloum@yahoo.com

What processes are involved for a request to access data/document
The request will be made by email and the answer will be sent within 15 days.

Comments