Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

The Effects of 8 Weeks of Dynamic Neuromuscular Stabilization (DNS) Training on Core Stability and Pelvic Alignment in Professional Male Rock Climbers

Protocol summary

Study aim

The effect of an 8-week Dynamic Neuromuscular Stabilization (DNS) training program on core stability and pelvic alignment in male professional rock climbers with lumbar hyperlordosis and anterior pelvic tilt.

Design

The study is a randomized controlled clinical trial with a parallel-group design and double blinding (participants and assessor). Thirty eligible participants will be randomly allocated via simple randomization (lottery method) into experimental and control groups (n = 15 per group). Given the non-pharmacological nature of the intervention, trial phases are not applicable.

Settings and conduct

This randomized clinical trial will be conducted at the Amin-ol-Sani Takhti Rock Climbing Hall in Neyshabour. The intervention group will follow a structured training program, while the control group will continue their usual training routine. Outcome variables will be assessed at pre-test and post-test. Participants and the assessor will be blinded to group allocation to minimize measurement bias.

Participants/Inclusion and exclusion criteria

The study will include 30 male professional rock climbers aged 15–20 years with at least 4 years of regular training (≥3 sessions/week), diagnosed with lumbar hyperlordosis and anterior pelvic tilt. Participants with recent musculoskeletal injury (≤6 months), spinal injury history, use of neuromuscular-affecting medication, or poor compliance will be excluded.

Intervention groups

The experimental group will participate in an 8-week Dynamic Neuromuscular Stabilization (DNS) training program, consisting of 3 sessions per week, each lasting 50–60 minutes. The control group will receive no intervention during the study period and will continue their usual activities and training routines.

Main outcome variables

Core stability of the trunk; pelvic alignment in the sagittal plane; pelvic alignment in the frontal plane

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20260609069720N1**
Registration date: **2026-06-17, 1405/03/27**
Registration timing: **prospective**

Last update: **2026-06-17, 1405/03/27**
Update count: **0**

Registration date

2026-06-17, 1405/03/27

Registrant information

Name

Hanie Sadat Rasouli

Name of organization / entity

Hakim Sabzevari University

Country

Iran (Islamic Republic of)

Phone

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-07-11, 1405/04/20

Expected recruitment end date

2026-09-21, 1405/06/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effects of 8 Weeks of Dynamic Neuromuscular Stabilization (DNS) Training on Core Stability and Pelvic Alignment in Professional Male Rock Climbers

Public title

The Effects of 8 Weeks of Dynamic Neuromuscular Stabilization (DNS) Training on Core Stability and Pelvic Alignment in Professional Male Rock Climbers

Purpose

Education/Guidance

Inclusion/Exclusion criteria

Inclusion criteria:

Male sex At least 4 years of professional rock-climbing experience (minimum of 3 regular training sessions per week) Age range of 15–20 years No history of acute injury within the past 6 months (particularly involving the spine, pelvic, and lower extremities), assessed using the NMQ questionnaire No use of medications affecting neuromuscular performance, assessed using the MUQ questionnaire Written informed consent for participation in the study Rock climbers with hyperlordosis (LLI ≥ 18) and anterior pelvic tilt (APT ≥ 10), based on international normative values

Exclusion criteria:

Occurrence of a new injury during the intervention period Missing more than two training sessions Initiation of any additional training program affecting core stability or pelvic alignment Use of any medication or specific treatment influencing motor or neuromuscular performance Incomplete participation or lack of full compliance with testing procedures or training sessions History of previous spinal injury

Age

From **15 years** old to **20 years** old

Gender

Male

Phase

N/A

Groups that have been masked

- Participant
- Outcome assessor

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

Following the selection of eligible participants based on the inclusion and exclusion criteria and the completion of informed consent forms, individuals will be randomly assigned to either the experimental or control group using simple randomization. For randomization purposes, each participant will be assigned a unique code, and the codes will be placed in identical and indistinguishable balls. Subsequently, through a lottery procedure, participants will be randomly allocated to either the control or experimental group. This method will be used to minimize selection bias and to ensure an equal probability of assignment to each study group.

Blinding (investigator's opinion)

Double blinded

Blinding description

During the introductory session and prior to allocation of participants to the experimental and control groups, the researcher will explain the general overview of the study, its objectives, and the experimental procedures to the participants. Due to the nature of the exercise-based intervention, blinding of both participants and the researcher will not be feasible. However, following the random allocation process, participants will be informed of their assignment to either the experimental or control group. All pre- and post-intervention assessments will be conducted by an independent evaluator holding a Master’s degree in Sports Injury and Corrective Exercises, who will remain blinded to group allocation (experimental or control). To ensure consistency of the assessment procedures, several pilot assessments will be conducted by both the researcher and the independent evaluator on the study variables prior to the commencement of the main study.

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee for Research, Hakim Sabzevari University

Street address

Tohid Town, Hakim Sabzevari University Campus, Sabzevar, Razavi Khorasan Province, Iran

City

Sabzevar

Province

Razavi Khorasan

Postal code

۹۶۱۷۹۷۶۴۸۷

Approval date

2025-10-25, 1404/08/03

Ethics committee reference number

IR.HSU.REC.1404.040

Health conditions studied

1

Description of health condition studied

Rock climbers with hyperlordosis and anterior pelvic tilt

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Core stability

Timepoint

Core stability will be assessed at the beginning of the study (pre-intervention) and at the end of the study (post-intervention).

Method of measurement

The variable will be assessed using the McGill isometric tests.

2

Description

Pelvic alignment in the sagittal plane (anterior and posterior pelvic tilt)

Timepoint

Pelvic alignment in the sagittal plane (anterior and posterior pelvic tilt) will be assessed at the beginning of the study (pre-intervention) and at the end of the study (post-intervention).

Method of measurement

The variable will be measured using an inclinometer.

3

Description

Pelvic alignment in the frontal plane (lateral pelvic tilt)

Timepoint

Pelvic alignment in the frontal plane (lateral pelvic tilt) will be assessed at the beginning of the study (pre-intervention) and at the end of the study (post-intervention).

Method of measurement

The variable will be measured using an inclinometer.

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: Dynamic Neuromuscular Stabilization (DNS) training will be performed for 8 weeks, 3 sessions per week, with each session lasting 50–60 minutes.

Category

N/A

2

Description

Control group: No intervention will be provided.

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

Amin-ol-Sani Takhti Rock Climbing Hall, Neyshabour.

Full name of responsible person

Iman Ehsani Far

Street address

Kamal Street, next to the Youth and Sports Office of Neyshabuor County, Iran.

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Hakim Sabzevari University

Full name of responsible person

Dr. Hosein Shahrokhi

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Tohid Township, Sabzevar, Razavi Khorasan Province, Hakim Sabzevari University Campus, Iran

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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

Hakim Sabzevari 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
Hakim Sabzevari University
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Position
Student
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
Yes - There is 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
Yes - There is a plan to make this available
Clinical Study Report
Yes - There is 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
Individual participant data, after anonymization (removal of identifying information), including baseline characteristics, administered interventions, and primary outcome measures, will be made available for sharing. In addition, if required, only data related to the primary outcomes and statistical analysis files will be provided to researchers. Access to the data will be granted after completion of the study and publication of the results, upon reasonable request to the principal investigator.
When the data will become available and for how long
Access to the study data and documentation will begin after the completion of the study and publication of the results. The data access period will start 6 months after publication of the article/results and will continue for a minimum of 2 years. During this period, anonymized data will be made available to researchers upon reasonable request.
To whom data/document is available
Study data will be made available to researchers and investigators active in academic and scientific fields. In

addition, researchers affiliated with recognized research institutions or relevant organizations (including academic or sports institutions) may request access to the anonymized dataset by submitting a reasonable request with a clearly defined research purpose. The use of the data will be strictly limited to scientific and research purposes only.

Under which criteria data/document could be used

In addition to the eligibility criteria for applicants, access to the study data and documentation will be subject to the following conditions: Submission of a formal request including a clearly defined research objective and a proposed analysis plan. Use of the data strictly for scientific, academic, and non-commercial purposes. Analyses must be conducted strictly within the scope of the approved objectives, and no analyses outside the approved scope are permitted. No attempt to re-identify study participants at any stage of data use. Maintenance of data confidentiality and prohibition of sharing data with third parties without prior written permission. Use of the data only for statistical analyses and research purposes relevant to the study objectives (e.g., descriptive, inferential, or secondary analyses aligned with the study aim). Adherence to ethical research principles and proper citation of the data source in any resulting publications. Use of study documents (e.g., protocol, analysis files) strictly for scientific reproducibility and methodological review purposes of the data source in any resulting publications. Use of study documents (e.g., protocol, analysis files) strictly for scientific reproducibility and methodological review purposes.

From where data/document is obtainable

Applicants seeking access to the study data and documentation should, in the first instance, contact the principal investigator of the study. Requests must be submitted in writing and include a description of the research purpose. If necessary, communication may also be made via the official email of the principal investigator provided below: Email: hanierasouli2001@gmail.com Contact information: Principal Investigator: Hanie Sadat Rasouli Institutional Email: hanierasouli@sun.hsu.ac.ir Phone number: +98 915 207 0440 Requests will be reviewed by the principal investigator, and will be accepted subject to approval and fulfillment of the required conditions.

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

The review and provision of access to study data and documentation will follow a stepwise process: Submission of request: The applicant must submit a written request to the principal investigator. The request should include the research objective, intended analyses, and required data. Initial screening: The principal investigator reviews the request for completeness, scientific relevance, and compliance with ethical principles and data confidentiality requirements. Evaluation and approval: If necessary, the request is further assessed in terms of alignment with study objectives, feasibility of the proposed analyses, and data protection considerations. Additional information may be requested from the applicant. Decision and agreement: If the request is approved, a data use agreement may be established outlining access conditions, usage restrictions, and confidentiality obligations. Data preparation and delivery: Anonymized datasets and/or relevant study documents are prepared and securely transferred to the approved applicant. Estimated timeline: The entire process, from submission of the request to data access, typically takes approximately 2 to 4 weeks. This duration may vary depending on the complexity of the request and the need for clarification or additional information. Final access will only be granted after approval by the principal investigator and completion of all required requirements Anonymized datasets and/or relevant study documents are prepared and securely transferred to the approved applicant. Estimated timeline: The entire process, from submission of the request to data delivery, typically takes approximately 2 to 4 weeks. This timeframe may vary depending on the complexity of the request and the need for clarification or additional information. Final access will only be granted after approval by the principal investigator and completion of any required agreements.

Comments