

Clinical Trial Protocol

Iranian Registry of Clinical Trials

27 Jul 2026

The effects of dynamic neuromuscular stability (DNS) and low-level laser therapy on the muscle function and pain in People with low back pain from muscle weakness

Protocol summary

Study aim

Determining the effects of dynamic neuromuscular stability (DNS) and low-level laser therapy on the muscle function and pain in People with low back pain from muscle weakness

Design

Clinical trial with intervention and control groups, 40 female randomly assigned to 4 groups

Settings and conduct

Forty women with chronic non-specific low back pain were selected from 100 people and then randomly paired with a pre-test pain intensity score of 3 to 6 on the visual analogue scale and divided into four groups: combination of exercise and low-level laser, exercise, low-level laser and control

Participants/Inclusion and exclusion criteria

Inclusion criteria: Female; Non-Specific low back pain from muscle weakness; Duration of low back pain more than three months; Pain intensity between 3 and 6 on the visual pain scale
Exclusion criteria: Use of anti-inflammatory and analgesic medications

Intervention groups

Intervention group 1: Exercise, Subject will perform exercises for 8 weeks, 3 sessions per week, each session lasting 90 minutes. Initially, they will perform myofascial release exercises for 25 minutes, stretching exercises for 15 minutes, then DNS exercises for 40 minutes along with breathing exercises, and finally cool down exercises for 10 minutes.
Intervention group 2: low-level laser therapy, Subjects undergo low-level laser treatment on specific days and for a specific number of sessions
Intervention group 3: Exercise with low-level laser therapy, Subject undergoes low-level laser and Exercise.
Intervention group 4: Subjects will be controlled without exercise and without low-level laser

Main outcome variables

Chronic non-Specific Low Back Pain, movement function,

quality of life, functional disability, lumbar spine range of motion, depression Inventory

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20250508065647N1**

Registration date: **2025-06-22, 1404/04/01**

Registration timing: **registered_while_recruiting**

Last update: **2025-06-22, 1404/04/01**

Update count: **0**

Registration date

2025-06-22, 1404/04/01

Registrant information

Name

Atefeh Rafieeamjad

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 31 3267 1146

Email address

atefe.rafieeamjad@iau.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-06-08, 1404/03/18

Expected recruitment end date

2025-06-23, 1404/04/02

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date
empty

Scientific title
The effects of dynamic neuromuscular stability (DNS) and low-level laser therapy on the muscle function and pain in People with low back pain from muscle weakness

Public title
The effect of exercise and laser therapy on the muscle function and pain in People with low back pain from muscle weakness

Purpose
Supportive

Inclusion/Exclusion criteria
Inclusion criteria:
 Female gender Non-Specific low back pain from muscle weakness Confirmation of the type of low back pain with clinical examination and paraclinical evidence Duration of low back pain more than three months Age range 40 to 50 years Pain intensity between 3 and 6 on the visual pain scale
Exclusion criteria:
 Aggravation of pain and disability with exercise Trauma or surgery during exercise Participation in regular weekly exercise activity Medical prohibition against participation in exercise activity Use of anti-inflammatory and analgesic medications

Age
From **40 years** old to **50 years** old

Gender
Female

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **40**

Randomization (investigator's opinion)
Randomized

Randomization description
Pairing of participants: First, a VAS pre-test will be administered to all(with chronic non-specific low back pain, without discopathy) and based on the participants' pre-test scores, they will be divided into pairs with similar pain intensity scores between 3 and 6 on the visual analogue scale. Random assignment: Each pair will be randomly assigned to one of 4 groups: exercise and low-level laser, exercise group, laser group, and control group(10 people in each group. The intervention (exercise and low-level laser) will not be applied to the control group. Finally, a post-test will be administered and the data will be analyzed.

Blinding (investigator's opinion)
Not blinded

Blinding description

Placebo
Not used

Assignment
Factorial

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics committee on Research Islamic Azad University
- Marvdasht Branch

Street address

Marvdasht: Three kilometers of Persepolis Boulevard.
Islamic Azad University of Marvdasht

City

Marvdasht

Province

Fars

Postal code

73711-13119

Approval date

2025-01-15, 1403/10/26

Ethics committee reference number

IR.IAU.M.REC.1403.560

Health conditions studied

1

Description of health condition studied

chronic non-specific low back pain

ICD-10 code

M54.5

ICD-10 code description

Low back pain

Primary outcomes

1

Description

low back pain

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring muscle pain intensity using a visual analog scale

2

Description

Endurance of trunk flexor muscles

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring trunk flexor muscle endurance with modified sit-up tes

3

Description

Endurance of trunk extensor muscles

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring the endurance of the trunk extensor muscles using the trunk lift test (extensor endurance)

4

Description

Strength of trunk flexor muscles

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring the strength of trunk flexor muscles with a dynamometer

5

Description

Strength of trunk extensor muscles

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring the strength of trunk extensor muscles with a dynamometer

6

Description

Flexibility

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring the flexibility of the back and hamstring muscles with the Sit and Reach test

Secondary outcomes

1

Description

Quality of life

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring quality of life with the SF36 quality of life questionnaire

2

Description

Depression Inventory

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring depression Inventory using the modified version of the Beck Depression Inventory

3

Description

Functional disability

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring functional disability with Oswestry Disability Index

4

Description

Range of motion of the lumbar spine

Timepoint

At the beginning and end of 8 weeks of study

Method of measurement

Measuring the range of motion of the lumbar spine with the modified-modified schober test

Intervention groups

1

Description

Intervention group 1: Exercise; Ten female subjects will perform dynamic neuromuscular stability (DNS) exercises with myofascial release for 8 weeks, 3 sessions per week, each session lasting 90 minutes, as follows: First, 25 minutes of myofascial release exercises and 15 minutes of stretching exercises, then 40 minutes of DNS exercises with breathing exercises, and finally 10 minutes of cool-down exercises.

Category

N/A

2

Description

Intervention group 2: Low-level laser; Ten female subjects will undergo low-level laser on specific days and for a specific number of sessions. Also, the following model power meter will be used to measure the optical power of the device every two weeks (by a researcher who is not involved) and the type of laser device PHOTONCARE model Moonlight and Starlight (2020) made in Germany

Category

N/A

3

Description

Intervention group 3: Exercise and low-level laser; Ten female subjects will perform dynamic neuromuscular stability (DNS) exercises with myofascial release for 8 weeks, 3 sessions per week, each session lasting 90 minutes, as follows: First, 25 minutes of myofascial release exercises and 15 minutes of stretching exercises, then 40 minutes of DNS exercises with breathing exercises, and finally 10 minutes of cool-down exercises and also subjects will undergo low-level laser on specific days and for a specific number of sessions. Also, the following model power meter will be used to measure the optical power of the device every two weeks (by a researcher who is not involved) and the type of laser device PHOTONCARE model Moonlight and Starlight

(2020) made in Germany

Category

N/A

4

Description

Control group 4: No intervention; Ten female subjects will be given control without Exercise and without low-level laser

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

Isfahan Health Land Institute

Full name of responsible person

Parvin Salsali

Street address

U 1, No. 42, Shahid Mehdi Salimian Aly, Bahar Azadi Ave, Azadi Sq

City

Isfahan

Province

Isfahan

Postal code

8173967793

Phone

+98 31 3620 5506

Email

psalsali5812@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Islamic Azad University

Full name of responsible person

Ms. Salehi

Street address

Jahan Rd, Kish International Branch, Islamic Azad University

City

Kish

Province

Hormozgan

Postal code

7941775883

Phone

+98 76 9109 9071

Fax

+98 76 9109 9071

Email

atefe.rafeeamjad@iau.ac.ir

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

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

Islamic Azad University

Full name of responsible person

Atefeh Rafieeamjad

Position

Teacher

Latest degree

Ph.D.

Other areas of specialty/work

Physiology

Street address

U 2, No. 8, Aseman De, Roshan Aly, Moshtagh Aval Ave, Bozorgmehr Sq, Isfahan, 8153687813

City

Isfahan

Province

Isfahan

Postal code

8153687813

Phone

+98 31 3267 1146

Fax

Email

atefe.rafeeamjad@iau.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity

Islamic Azad University

Full name of responsible person

Atefeh Rafieeamjad

Position

Teacher

Latest degree

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Other areas of specialty/work

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+98 31 3267 1146

Fax**Email**

atefe.rafeeemjad@iau.ac.ir

Isfahan

Postal code

8153687813

Phone

+98 31 3267 1146

Fax**Email**

atefe.rafeeemjad@iau.ac.ir

Person responsible for updating data**Contact****Name of organization / entity**

Islamic Azad University

Full name of responsible person

Atefeh Rafieeamjad

Position

Teacher

Latest degree

Ph.D.

Other areas of specialty/work

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Street address

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City

Isfahan

Province**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