Clinical Trial Protocol
Iranian Registry of Clinical Trials

11 Sep 2026

Comparison of the effect of dynamic neuromuscular stability exercises and yoga exercises on women with chronic non-specific low back pain

Protocol summary

Study aim
Comparison of the effect of dynamic neuromuscular stability exercises and yoga exercises on women with chronic non-specific low back pain

Design
The clinical trial research will be a single-blind, pre-test and post-test design. Individuals will be randomly classified into 2 groups, with the groups performing dynamic neuromuscular exercises and yoga.

Settings and conduct
Karaj: Participants recruited via social media, sports, physiotherapy. Randomized into DNS/Yoga groups post-consent. 12-week training: twice weekly supervised, twice unsupervised. Pre/post-tests 48h post-training.

Participants/Inclusion and exclusion criteria
Inclusion criteria for the study: Women aged 18-45 years with chronic non-specific low back pain. Women diagnosed with chronic non-specific low back pain for more than 12 weeks and a VAS score between 3 and 7. Exclusion criteria: Irregular participation in training sessions (absence from two consecutive training sessions or three intermittent training sessions). Participation in yoga or back-related exercises in the past three months.

Intervention groups
Dynamic neuromuscular exercise group: Exercises in developmental positions (3 to 14 months), each movement 30–60 seconds with 5 repetitions, for 12 weeks (2 supervised and 2 unsupervised sessions per week). Yoga group: 11 exercises including asanas, pranayama, and shavasana, each movement 30–60 seconds with 5 repetitions, for 12 weeks (2 supervised and 2 unsupervised sessions per week).

Main outcome variables
1. Pain intensity - Visual Analogue Scale (VAS) 2. Quality of life - SF-36 Questionnaire 3. Dynamic balance - Y-Balance Test 4. Motor function - Pressure Biofeedback 5. Lumbar extensor muscle endurance - Sorensen Test

General information

Reason for update
Acronym
IRCT registration information
IRCT registration number: **IRCT20240907062968N8**
Registration date: **2026-06-12, 1405/03/22**
Registration timing: **prospective**

Last update: **2026-06-12, 1405/03/22**
Update count: **0**

Registration date
2026-06-12, 1405/03/22

Registrant information
Name
Ali Honarvar
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Recruitment status
Recruitment complete
Funding source

Expected recruitment start date
2026-06-15, 1405/03/25
Expected recruitment end date
2026-06-26, 1405/04/05
Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title

Comparison of the effect of dynamic neuromuscular stability exercises and yoga exercises on women with chronic non-specific low back pain

Public title
Comparison of the effect of dynamic neuromuscular stability exercises and yoga exercises on women with low back pain
Purpose
Prevention
Inclusion/Exclusion criteria
Inclusion criteria:
Women aged 18-45 with chronic non-specific low back pain Women diagnosed with chronic non-specific low back pain for more than 12 weeks with a pain ruler scale between 3 and 7
Exclusion criteria:
Failure to regularly attend training sessions (absence from two continuous training sessions or three intermittent training sessions) Traumatic low back pain (lumbar vertebrae) Participation in yoga or back-related exercises in the last three months
Age
From **18 years** old to **45 years** old
Gender
Both

Phase
N/A
Groups that have been masked

- Outcome assessor
- Data analyser

Sample size
Target sample size: **34**
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 and the second experimental 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 dynamic neuromuscular exercises group, and the number 2 for the yoga exercises 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-minute 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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Approval date
2025-09-23, 1404/07/01
Ethics committee reference number
IR.IAU.K.REC.1404.123

Health conditions studied

1

Description of health condition studied
Low back pain
ICD-10 code
M54.5
ICD-10 code description
Low back pain

Primary outcomes

1

Description
Visual Analog Scale for pain assessment
Timepoint
Before and after the intervention
Method of measurement
The visual analog scale is a 10 cm horizontal line with the words "pain-free" at its left end and "worst imaginable pain" at its right end. In other words, this scale is a 10 cm horizontal bar with zero at one end (no

pain) and 10 at the other end (most severe pain). Patients were asked to mark a point on this 10 cm line according to the numbers at both ends, indicating their level of pain, so that zero represented no pain and a score of ten represented the most severe pain. Then, using a ruler, the distance from this point to the starting point of the zero side was measured, and the obtained number was considered as the patient's pain. On this scale, pain intensity was categorized into four levels: no pain (0-4 mm), mild pain (5-44 mm), moderate pain (45-74 mm), and severe pain (75-100 mm).

2

Description

36-Item Quality of Life Questionnaire (SF-36)

Timepoint

Before and after the intervention

Method of measurement

Quality of life is an individual's perception of their health and satisfaction with it. The World Health Organization defines it as an individual's perception of their position in life, within the cultural and value context in which they live, and in relation to their goals, expectations, standards, and concerns. A recent study by Tom et al. shows that in addition to physical condition, psychological and social factors also affect the quality of life of patients with chronic low back pain. The Quality of Life Index questionnaire is a 36-item tool that measures satisfaction and importance of various aspects of life. This questionnaire includes 8 subscales (physical function, physical activity limitation, mental activity limitation, energy/fatigue, emotional well-being, social function, pain, and general health), each subscale having 2 to 10 items. Also, two general subscales of physical health and mental health are obtained by integrating these subscales. The score for each question is between 0 and 100, with a higher score indicating better quality of life. This questionnaire has the necessary validity and reliability in the Iranian population.

3

Description

Dynamic balance

Timepoint

Before and after the intervention

Method of measurement

The Y-balance test is a modified version of the star balance test, which includes analyzing performance in only three of the eight main directions: one anterior direction and two other directions at a 135-degree angle in the posterior-external and posterior-internal sections. In this test, three lines were drawn on the ground in the mentioned directions, and patients performed this test with their dominant leg in the anterior, posterior-external, and posterior-internal directions. Scoring was done in such a way that the sum of the records of the three directions for each patient was considered as their Y-balance test. It should be noted that all patients performed this test barefoot.

4

Description

Lumbopelvic Motor Control Performance Test

Timepoint

Before and after the intervention

Method of measurement

This test, introduced by Yang and colleagues using the lumbopelvic stability test, measures lumbopelvic motor control performance. The patient is in a supine position, with the hip and knee flexed to 90 degrees and the foot on the ground. The pressure biofeedback cuff is placed horizontally under the lumbar spine with its lower edge aligned with the posterior superior iliac spine. The baseline biofeedback pressure is set to 40 mmHg. The subject is then asked to lift one leg off the mat and flex the hip and knee joints to 90 degrees, maintaining this position for 4-6 seconds. The maximum pressure change read from the device is recorded as uncontrolled lumbopelvic movements.

5

Description

Trunk Extensor muscle endurance

Timepoint

Before and after the intervention

Method of measurement

For assessing **trunk extensor muscle endurance**, the **Sorensen test** was used. Participants were positioned in the prone position on an examination table, with the superior border of the iliac crest aligned with the edge of the table. During the test, the hip, knee, and ankle joints were stabilized using three straps. Participants were instructed to place their arms across their chest and maintain their trunk in a horizontal isometric position. The duration for which the participant was able to maintain this position was recorded. The test was terminated when the trunk flexed more than 5–10 degrees. The **minimal detectable change (MDC)** reported for the Sorensen test was **10 seconds**.

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: DNS group: Participants performed 8 exercises based on developmental positions (3–14 months), with each exercise performed for 30–60 seconds in 5 repetitions. The training program was conducted for 12 weeks, including 2 supervised and 2 unsupervised sessions per week.

Category

N/A

2

Description

Intervention group: Participants performed 11 yoga exercises, including postures, Pranayama, and Shavasana. Each exercise was performed for 30–60 seconds in 5 repetitions. The intervention lasted 12 weeks and consisted of 2 supervised and 2 unsupervised sessions per week.

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

Sponsor

Name of organization / entity
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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
Ph.D.

Other areas of specialty/work
Physiotherapy

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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