

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

15 Jun 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

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 26 3443 4073

##### Email address

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##### Recruitment status

**recruiting**

##### 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](http://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

##### City

Karaj

##### Province

Alborz

##### Postal code

3149968111

#### 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 Mazloun

**Street address**

Moazeen Boulevard, Islamic Azad University, Karaj Branch

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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 Mazloun

**Position**

Assistant Professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Physiotherapy

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**Position**

assistant professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

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## Person responsible for updating data

**Contact**

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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.mazloun@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**