Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

Comparative Effects of Core Stability and Postural Control Training on Pain, Disability, and Sensorimotor Function in Women with Chronic Non-Specific Low Back Pain: A Three-Armed Randomized Controlled Trial

Protocol summary

Study aim
Comparative the effects of core stability training (CST) and postural control training (PCT) on pain, functional disability, proprioception, balance, and quality of life (QOL) in middle-aged women with chronic non-specific low back pain

Design
A controlled clinical trial practical groups, single blind, randomized, phase 3, conducted on 51 patient. Computer software was used for randomization.

Settings and conduct
Women with history of chronic non-specific low back pain who have been approved by medicin and refered to Arvand physiotherapy clinic and had at least 3 months elapsed since their chronic non-specific low back pain were invited to participate in this study

Participants/Inclusion and exclusion criteria
Being female and middle-age, more than 3 months elapsed since chronic non-specific low back pain

Intervention groups
Intervention group: core stability training or postural control training, Control group: did not receive any training

Main outcome variables
Scores of visual anloge scale for pain, Roland-Morris Disability and Oswestry Disability questionnaire, static balance, lumbo-pelvic proprioception, and quality of life

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20250519065806N2**
Registration date: **2026-04-12, 1405/01/23**
Registration timing: **prospective**
Last update: **2026-04-12, 1405/01/23**
Update count: **0**

Registration date
2026-04-12, 1405/01/23

Registrant information

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Name of organization / entity
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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2026-09-06, 1405/06/15

Expected recruitment end date
2026-10-06, 1405/07/14

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
Comparative Effects of Core Stability and Postural Control Training on Pain, Disability, and Sensorimotor Function in Women with Chronic Non-Specific Low Back Pain: A Three-Armed Randomized Controlled Trial

Public title
Comparative Effects of Core Stability and Postural

Control Training on chronic non-specific low back pain

Purpose

Supportive

Inclusion/Exclusion criteria

Inclusion criteria:

female sex middle age (40-57) chronic non-specific low back pain for more than three months absence of specific spinal pathology or musculoskeletal disoredrs approved chronic non-specific low back pain by doctor of medicine Willingness to participate in the intervention and written informed consent Pain intensity of at least 3 out of 10 based on the visual analog scale No participation in structured rehabilitation or corrective exercise programs during the previous three months.

Exclusion criteria:

History of spinal surgery Presence of specific spinal disorders such as: lumbar disc herniation, spondylolisthesis, spinal stenosis Presence od radiculopathy or radiating pain to the lower limbs Neurological or vestibular disorders affecting balance or motor control Musculoskeletal injury in the lower extrimities during the past six months Pregnancy or planning to become pregnant during the study period absence from more than two exercise sessions during the interventional period

Age

From **40 years** old to **57 years** old

Gender

Female

Phase

3

Groups that have been masked

- Outcome assessor
- Data analyser
- Data and Safety Monitoring Board

Sample size

Target sample size: **51**

More than 1 sample in each individual

Number of samples in each individual: **1**

Cchronic non-specific low back pain data of lumbar function

Randomization (investigator's opinion)

Randomized

Randomization description

After completion of baseline assessments, participants were randomly allocated to one of three groups: core stability training (CST), postural control training (PCT), or control. Randomization was performed using a simple random allocation procedure with a 1:1:1 ratio to ensure equal group sizes. The randomization sequence was generated using a computer-based random number generator by a researcher who was not involved in participant recruitment, intervention delivery, or outcome assessment. Allocation assignments were placed in sequentially numbered opaque sealed envelopes, which were opened only after completion of baseline measurements. To reduce assessment bias, the outcome assessor remained blinded to group allocation throughout the study. Participants were instructed not to disclose their assigned intervention during post-intervention testing.

Blinding (investigator's opinion)

Single blinded

Blinding description

Outcome assessor and data and statistical analyzer will be blinded from knowing intervention groups. This individual, a physiotherapist, is blinded to group allocation and is unaware of which participants belong to the intervention group and which belong to the control group.

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee of the Islamic Azad University, Science and Research Branch, Tehran

Street address

Simon Bolivar street, Science and Research Branch, Islamic Azad University,

City

Tehran

Province

Tehran

Postal code

1466998567

Approval date

2024-08-31, 1403/06/10

Ethics committee reference number

IR.IAU.SRB.REC.1403.295

Health conditions studied

1

Description of health condition studied

Chronic non-specific low back pain

ICD-10 code

M40.56

ICD-10 code description

Lordosis, unspecified, lumbar region

Primary outcomes

1

Description

Pain intensity, Functional disability, Lumbo-pelvic proprioception, Static balance, Quality of life (QOL)

Timepoint

First week and 8 weeks

Method of measurement

Visual Analog Scale (VAS), Oswestry Disability Index, Roland–Morris Disability Questionnaire, joint position reproduction test (Goniometer), Stork Stand Test, Short form SF-36 questionnaire

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: After obtaining ethical approval, middle-aged women with chronic non-specific low back pain (CNSLBP) who met the study inclusion criteria were invited to participate. Eligible participants were identified through structured interviews and questionnaires collecting demographic and medical history data. Inclusion criteria were female sex, middle age, CNSLBP for more than three months, and absence of specific spinal pathology. Exclusion criteria included a history of spinal surgery, radiculopathy, neurological or vestibular disorders, recent lower extremity injury, or participation in structured rehabilitation programs during the study.All participants received detailed verbal and written explanations of the study objectives, procedures, and their responsibilities, and provided written informed consent. Demographic characteristics, physical activity history, and pain intensity were collected via questionnaires and face-to-face interviews.A total of 51 eligible participants were randomly allocated into three equal groups: core stability training (CST) (n = 17), postural control training (PCT) (n = 17), and control (n = 17). The two intervention groups completed supervised exercise programs three times per week for eight consecutive weeks, with each session lasting approximately 45 minutes, including a 10-minute warm-up, 30 minutes of main exercises, and a 5-minute cool-down. Exercise intensity and difficulty were progressively increased based on participants' mastery and tolerance. CSTProtocol: This program included exercises such as plank, side plank, bird dog, glute bridge, and single-leg bridge, emphasizing controlled isometric contraction of deep trunk muscles, maintenance of neutral spinal alignment, and coordinated breathing. Hold times increased progressively from 5–7 seconds in week one to 26–28 seconds by week eight. PCT Protocol: This program consisted of three progressive phases over eight weeks. The first two weeks were performed on stable surfaces, weeks three to five on a gym ball to increase neuromuscular demand, and weeks six to eight incorporated external resistance using elastic bands and weights. Emphasis was placed on maintaining neutral spinal posture, activating deep trunk muscles, and progressively increasing exercise intensity.All participants were assessed at baseline and immediately post-intervention. Outcome measures included pain intensity (Visual Analog Scale), health-related quality of life (Short Form-36), functional disability (Roland Morris Disability Questionnaire and Oswestry Disability Index), static balance (Stork Stand Test), and lumbar-pelvic proprioception (joint position reproduction test with goniometer).

Category

Rehabilitation

2

Description

Contol group:After obtaining the ethical approval code, women will be invited to participate in this study. To invite participants, the researcher will visit the physician's office and, after reviewing the medical records of individuals who have chronic non-specific low back pain will select samples for this study based on the inclusion and exclusion criteria. These criteria will be evaluated through contact with the individuals. Based on the sample size assessment and their initial willingness to participate, the study's objectives and the potential positive and negative outcomes of participation will be explained to them. They will also be assured that they can withdraw from the study at any stage if they no longer wish to continue. Then, the informed consent form will be provided to those who confirm their willingness to participate, and they will be asked to sign it. Following this, demographic information including age, weight, and height will be collected through face-to-face interviews. Outcome measures included pain intensity (Visual Analog Scale), health-related quality of life (Short Form-36), functional disability (Roland Morris Disability Questionnnaire and Oswestry Disability Index), static balance (Stork Stand Test), and lumbar-pelvic proprioception (joint position reproduction test with goniometer). Before starting the exercises, a pre-test will be conducted for all participants in the control group, with the order of the pre-test standardized for all individuals. In the control group, no intervention will be performed for 8 weeks, and individuals will continue their normal daily activities.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Arvand Physiotherapy

Full name of responsible person

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1

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Grant name
Mo
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
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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
Yes - There is 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
There is no further information
When the data will become available and for how long
3 Month after pulication
To whom data/document is available
Everyone
Under which criteria data/document could be used
For research and rehabilitation
From where data/document is obtainable
Email
What processes are involved for a request to access data/document
One week time to gather the needed data
Comments