Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Comparison of the effect of magnesium and synbiotic supplementation on cognitive function, quality of life, and frailty in older adults with mild cognitive impairment

Protocol summary

Study aim

Comparison of the effect of magnesium and synbiotic supplementation on cognitive function, quality of life, and frailty in older adults with mild cognitive impairment

Design

A clinical trial with control group, double-blind, randomized, parallel-group on 63 participants. Random Allocation Software was used for randomization.

Settings and conduct

Participants will be selected by simple random sampling from elderly care centers across Shiraz; after screening and confirming the disease, and if they meet the study entry criteria, the informed consent form will be completed. Participants will be placed in one of three groups: magnesium intervention, synbiotic, and placebo by a random block method. Outcomes will be evaluated at the beginning and end of the study. The duration of the intervention is 8 weeks. Also, in this study, participants and the researcher will be blinded.

Participants/Inclusion and exclusion criteria

Inclusion criteria included: age 65 years and older, mild cognitive impairment, no severe renal/liver/pulmonary insufficiency, no uncontrolled diabetes, no severe neurological or psychiatric disorders, no adherence to special diets, no current use of medications that interact with magnesium. Exclusion criteria included changes in usual diet and medication, initiation of antibiotic therapy, occurrence of any side effects that stopped with discontinuation of the intervention, adherence of less than 80% and unwillingness to continue cooperation.

Intervention groups

Eligible people are placed in one of the following groups by random blocking method: group1: taking a capsule containing 300 mg of elemental magnesium daily. Group 2: taking a synbiotic capsule daily. Group 3: taking a placebo

Main outcome variables

Cognitive function, quality of life, frailty

General information

Reason for update

1. Removal of serum hs-CRP measurement: Given that the implementation and sample collection phases of the study coincided with a period of critical and unstable social conditions, including the war and its related consequences, regular participant follow-up and laboratory visits became challenging. This issue was particularly relevant given the clinical trial design of the study, which requires continuous and regular follow-up of participants. In addition, budgetary constraints contributed to this limitation. Therefore, measurement of high-sensitivity C-reactive protein (hs-CRP) was removed from the study. Accordingly, the study title, objectives, problem statement, methodology, assessment tools, and other relevant sections of the protocol were reviewed and revised. 2. Removal of the PASE questionnaire and use of the third section of the Fried Frailty Scale: Since both the Physical Activity Scale for the Elderly (PASE) and the Fried Frailty Scale assess physical activity and have considerable overlap in terms of their content, the PASE questionnaire was removed from the study to reduce the assessment burden and facilitate greater cooperation among older participants. Therefore, participants' physical activity levels will be assessed solely using the third section of the Fried Frailty Scale. Accordingly, the section describing the instrument used to assess physical activity was reviewed and revised. 3. Expansion of the study recruitment sites: To increase the diversity of the study population and reduce the potential for selection bias associated with recruiting participants from a single site, the study recruitment setting was expanded from one elderly-related center to all elderly care centers across Shiraz. Accordingly, individuals will undergo screening at centers across the city, and those who meet the criteria will be referred to the Imam Reza

(AS) Clinic. Accordingly, the sections describing the study setting and participant recruitment procedures were revised and updated.

Acronym

IRCT registration information

IRCT registration number: **IRCT20250317065109N1**
Registration date: **2025-04-02, 1404/01/13**
Registration timing: **prospective**

Last update: **2026-09-17, 1405/06/26**
Update count: **1**

Registration date

2025-04-02, 1404/01/13

Registrant information

Name

Rahil Ranjbar

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 71 5357 9434

Email address

rahilranjbar9@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-04-21, 1404/02/01

Expected recruitment end date

2025-09-22, 1404/06/31

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of the effect of magnesium and synbiotic supplementation on cognitive function, quality of life, and frailty in older adults with mild cognitive impairment

Public title

Comparison of the effect of magnesium and synbiotic supplementation on cognitive function, quality of life, and frailty

Purpose

Supportive

Inclusion/Exclusion criteria

Inclusion criteria:

Age 65 years and older Suffering from mild cognitive impairment, based on the Mini-ACE cognitive function evaluation form Ability and willingness to participate in the study No smoking/alcohol and drug addiction Absence of severe renal/hepatic/pulmonary insufficiency, uncontrolled diabetes, severe neurological or psychiatric disorders such as Bipolar disorder, Parkinson's disease, Dementia, unstable thyroid disease; Immune disorders such as HIV/AIDS Not following specific diets (such as Ketogenic, Vegetarian, etc.) No current use of medications that interact with magnesium, such as muscle relaxants, Penicillamine, Corticosteroids, Methyldopa, Magnesium-containing antacids, or other magnesium-containing products Participants must have not taken antibiotics and probiotic, magnesium, and antioxidant supplements for at least 2 weeks prior to the start of the study

Exclusion criteria:

Changes in usual diet and medication Starting antibiotic therapy The occurrence of any side effects that stops when the intervention is discontinued. Less than 80% adherence to supplement use Unwillingness to continue cooperation

Age

From **65 years** old

Gender

Both

Phase

N/A

Groups that have been masked

- Participant
- Investigator
- Outcome assessor
- Data analyser

Sample size

Target sample size: **63**

Randomization (investigator's opinion)

Randomized

Randomization description

Participants will be randomly assigned to three groups: magnesium intervention, synbiotic intervention, and control (A, B, C) based on the random blocking method using the Random Allocation Software with a ratio of 1:1:1. This group assignment will be done by a person outside the study before the start of the design implementation process, and these sequences will be placed in sealed numbered envelopes by the same person in order to blind the researchers to the participant group by concealing the allocation. After screening with a cognitive function assessment questionnaire and confirmation of mild cognitive impairment, participants will be referred to the research team. After completing the evaluations and the initial questionnaires, an envelope will be opened according to the established order, and the assigned intervention group will be determined for the participating individual. This randomization and the groups will remain hidden from the researchers and participants until the statistical analysis is complete.

Blinding (investigator's opinion)

Double blinded

Blinding description

In the first phase of the study, the supplements and placebo are placed in capsules that are similar in color, size, and shape and are packaged. In this phase, the capsules are labeled with the Latin contract names A, B, and C. In the intervention phase, the random assignment sequence is also identified with the same names by a person outside the study. Therefore, during the study, the participants and the researcher, who is in charge of

carrying out the clinical phase, clinical evaluations, follow-up of laboratory tests, and data analysis, will be blinded to the assigned group and the intervention in each group.

Placebo
Used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Ethics committee of Shiraz University of Medical Sciences

Street address
Shiraz University of Medical Sciences Central Building, in front of Palestine, Zand Street

City
Shiraz

Province
Fars

Postal code
7134814336

Approval date
2025-02-16, 1403/11/28

Ethics committee reference number
IR.SUMS.SCHEANUT.REC.1403.119

Health conditions studied

1

Description of health condition studied
Mild cognitive impairment

ICD-10 code
G31.84

ICD-10 code description
Mild cognitive impairment, so stated

Primary outcomes

1

Description
Cognitive function score in the Mini-Addenbrooke’s Cognitive Examination (M-ACE) questionnaire

Timepoint
Cognitive function assessment before the start of the intervention and 8 weeks later (end of the study)

Method of measurement
Mini-Addenbrooke’s Cognitive Examination (Mini-ACE) questionnaire

Secondary outcomes

1

Description
Quality of life score in the Older People's Quality of Life questionnaire (OPQOL-brief)

Timepoint
Quality of life assessment before the start of the intervention and 8 weeks later (end of the study)

Method of measurement
Older People's Quality of Life questionnaire-brief version (OPQOL-brief)

2

Description
Frailty score in the Frailty Syndrome Checklist 5-Items in Frail Older Adults in Iran (Fried's Five-Point Frailty Test)

Timepoint
Frailty assessment before the start of the intervention and 8 weeks later (end of the study)

Method of measurement
Frailty score in the Frailty Syndrome Checklist 5-Items in Frail Older Adults in Iran (Fried's Five-Point Frailty Test)

Intervention groups

1

Description
First intervention group: In this group, individuals will receive one capsule containing 300 mg of elemental magnesium (500 mg of magnesium in the form of magnesium oxide) daily for 8 weeks. Magnesium supplements will be prepared by Jalinous Pharmaceutical Company in the form of magnesium oxide powder and encapsulated by the Shiraz Faculty of Pharmacy.

Category
Treatment - Other

2

Description
Second intervention group: In this group, individuals will receive one synbiotic capsule daily for 8 weeks. The synbiotic supplement will be provided in capsule form by the Zist Takhmir Pharmaceutical Company (Familact®). This supplement contains 109 CFU of probiotics including Lactobacillus plantarum, Lactobacillus rhamnosus, Lactobacillus acidophilus, Lactobacillus casei, Bifidobacterium breve, Bifidobacterium longum, Bifidobacterium lactis, Bifidobacterium bifidum, Streptococcus thermophilus, and 74 mg of fructooligosaccharide in synbiotic form.

Category
Treatment - Other

3

Description
Control group: In this group, individuals will receive a

placebo in capsule form that is similar in appearance to the intervention group for 8 weeks. Also, the placebo will be provided in capsule form by Zist Takhmir Pharmaceutical Company. The content of the placebo will be mostly maltodextrin and lactose monohydrate.

Category
Placebo

Recruitment centers

1

Recruitment center

Name of recruitment center
Imam Reza (AS) Specialized and Sub-specialized Clinic, Shiraz

Full name of responsible person
Afsane Ahmadi

Street address
Namazi Square

City
Shiraz

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Fars

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7134814734

Phone
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Shiraz University of Medical Sciences

Full name of responsible person
Hamid Mohammadi

Street address
Shiraz University of Medical Sciences central building, in front of Palestine St., Zand St.

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Fax

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mohammadi@sums.ac.ir

Web page address
https://research.sums.ac.ir

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?
Yes

Title of funding source
Shiraz University of Medical Sciences

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
Shiraz University of Medical Sciences

Full name of responsible person
Rahil Ranjbar

Position
Master's degree student

Latest degree
Bachelor

Other areas of specialty/work
Nutrition

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Alley 19, Yas street, Ayatollah Nassabeh Town, Darab

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Person responsible for scientific inquiries

Contact

Name of organization / entity
Shiraz University of Medical Sciences

Full name of responsible person
Afsane Ahmadi

Position
Assistant professor, Faculty member / School of Nutrition and Food Sciences / Shiraz University of M

Latest degree
Ph.D.

Other areas of specialty/work
Nutrition

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School of Nutrition and Food Sciences, in front of Bargh Sports Club, Razi Blvd, Shiraz

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Person responsible for updating data

Contact

Name of organization / entity

Shiraz University of Medical Sciences

Full name of responsible person

Rahil Ranjbar

Position

Master's degree student

Latest degree

Bachelor

Other areas of specialty/work

Nutrition

Street address

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Email

Rahilranjbar9@gmail.com

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