Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

The Effect of Aromatherapy with the Scent of Moist Soil on Reducing Exam Anxiety and Enhancing Concentration in Pharmacy Students

Protocol summary

Study aim
To evaluate the effect of aromatherapy with petrichor aroma containing geosmin on exam anxiety and academic performance in pharmacy students

Design
A double blinded randomized controlled clinical trial with parallel groups. Participants are allocated to intervention or control groups using block randomization based on a computer generated sequence and sealed opaque envelopes. The sample size is 64 patients in each groups.

Settings and conduct
The trial will be conducted at the School of Pharmacy of Mashhad University of Medical Sciences during the pharmacotherapy course examination. After eligibility screening and informed consent, participants are randomly assigned to the study groups. Aromatherapy or placebo is administered before the exam. Exam anxiety questionnaires are completed and exam scores are obtained from the education office. Participants and outcome assessors are blinded.

Participants/Inclusion and exclusion criteria
Participants are pharmacy students at Mashhad University of Medical Sciences; age 20 to 40 years; scheduled to take the pharmacotherapy course exam in the current semester. Non inclusion criteria include recent use of anxiolytics, acute respiratory illness, severe fragrance allergy, unstable medical conditions, or unwillingness to participate.

Intervention groups
Participants in the intervention group receive an aromatherapy solution containing petrichor aroma with geosmin through inhalation shortly before the exam. The control group receives a placebo solution consisting of sterile distilled water without geosmin using the same procedure and duration. The containers and procedures are identical in both groups.

Main outcome variables
Change in exam anxiety severity based on a standardized anxiety questionnaire score before and immediately prior to the exam; pharmacotherapy course exam score as a measure of academic performance.

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20251208068253N2**
Registration date: **2026-05-15, 1405/02/25**
Registration timing: **prospective**

Last update: **2026-05-15, 1405/02/25**
Update count: **0**

Registration date
2026-05-15, 1405/02/25

Registrant information

Name
Farshad Abedi

Name of organization / entity

Country
Iran (Islamic Republic of)

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abeditf@mums.ac.ir

Recruitment status
recruiting

Funding source

Expected recruitment start date
2026-06-22, 1405/04/01

Expected recruitment end date
2027-08-23, 1406/06/01

Actual recruitment start date
empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effect of Aromatherapy with the Scent of Moist Soil on Reducing Exam Anxiety and Enhancing Concentration in Pharmacy Students

Public title

The Effect of Aromatherapy with the Scent of Moist Soil on Anxiety and Concentration

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Pharmacy students currently enrolled at the School of Pharmacy of Mashhad University of Medical Sciences Age between 20 and 40 years Participation in the specified pharmacotherapy course examination during the current semester Willingness to participate in the study and signing the written informed consent

Exclusion criteria:

History of major psychiatric disorders Use of anxiolytics or other medications affecting mood or stress during the past four weeks History of severe allergy or hypersensitivity to fragrances or perfumes Presence of serious respiratory diseases that limit inhalation of fragrances Presence of acute illness or unstable medical condition at screening

Age

From **20 years** old to **40 years** old

Gender

Both

Phase

3

Groups that have been masked

- Participant
- Investigator
- Outcome assessor

Sample size

Target sample size: **142**

Randomization (investigator's opinion)

Randomized

Randomization description

This study is designed as a double blind randomized controlled trial. Participants will be randomly allocated to the intervention group receiving the petrichor aroma or the control group receiving the placebo solution. The aromatic solutions will be prepared and coded by an independent researcher who is not involved in participant recruitment, outcome assessment, or data analysis. Both solutions will be placed in identical containers with similar appearance. Participants, investigators involved in data collection, and outcome assessors will remain unaware of the group allocation throughout the study. The allocation code will be kept confidential and will only be revealed after completion of data collection and primary data analysis.

Blinding (investigator's opinion)

Double blinded

Blinding description

This study is designed as a double blind randomized controlled trial. Participants will be randomly allocated to the intervention group receiving the petrichor aroma or the control group receiving the placebo solution. The aromatic solutions will be prepared and coded by an independent researcher who is not involved in participant recruitment, outcome assessment, or data analysis. Both solutions will be placed in identical containers with similar appearance. Participants, investigators involved in data collection, and outcome assessors will remain unaware of the group allocation throughout the study. The allocation code will be kept confidential and will only be revealed after completion of data collection and primary data analysis.

Placebo

Used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee of Mashhad University of Medical Sciences

Street address

Faculty of Medicine, East Gate of University Campus, Azadi Square

City

Mashhad

Province

Razavi Khorasan

Postal code

9177948564

Approval date

2026-04-11, 1405/01/22

Ethics committee reference number

IR.MUMS.REC.1405.007

Health conditions studied

1

Description of health condition studied

Generalized anxiety disorder

ICD-10 code

F41.1

ICD-10 code description

Generalized anxiety disorder

2

Description of health condition studied

Adjustment disorders

ICD-10 code
F43.2
ICD-10 code description
Adjustment disorders

Primary outcomes

1

Description
Exam anxiety score according to the Depression, Anxiety and Stress Scale consisting of 21 items (DASS-21) questionnaire
Timepoint
Measured at two time points including before the intervention and immediately after the exam
Method of measurement
Depression, Anxiety and Stress Scale consisting of 21 items with calculation of the anxiety subscale score

2

Description
Exam anxiety intensity measured using the Visual Analogue Scale for anxiety severity (VAS)
Timepoint
Measured at two time points including before the intervention and immediately after the exam
Method of measurement
Visual Analogue Scale consisting of a 10 centimeter line on which the participant marks the perceived anxiety level ranging from zero meaning no anxiety to ten meaning the worst imaginable anxiety

Secondary outcomes

1

Description
Students academic performance score in the written course examination
Timepoint
The examination score at the end of the test
Method of measurement
Recording the written examination score of students according to the official university grading system

2

Description
Students heart rate as a physiological indicator of stress
Timepoint
Measured at two time points including before the intervention and immediately after the examination
Method of measurement
Digital heart rate monitoring device

3

Description
Students systolic and diastolic blood pressure as a physiological indicator of stress
Timepoint
Measured at two time points including before the intervention and immediately after the examination
Method of measurement
Digital blood pressure monitoring device

Intervention groups

1

Description
Intervention group: Participants in the intervention group are exposed to aromatherapy with the smell of moist soil before the examination. For this purpose a specified amount of moist soil scent extract is placed on a sterile absorbent pad positioned approximately 30 centimeters from the participant allowing the aroma to be inhaled naturally. The intervention is performed in a quiet and controlled environment for 10 minutes prior to the beginning of the examination. Participants remain seated and breathe normally during the exposure period.
Category
Treatment - Drugs

2

Description
Control group: Participants in the control group are exposed to a neutral smelling solution that is used as a placebo before the examination. For this purpose a specified amount of an inactive odorless solution is placed on a sterile absorbent pad positioned approximately 30 centimeters from the participant. The intervention is performed in a quiet and controlled environment for 10 minutes prior to the beginning of the examination. Participants remain seated and breathe normally during the exposure period. The environmental conditions, duration of exposure and procedure are identical to the intervention group and the only difference is the absence of the moist soil smell in the solution used for the control group.
Category
Treatment - Drugs

Recruitment centers

1

Recruitment center
Name of recruitment center
School of pharmacy, Mashhad University of Medical Sciences
Full name of responsible person
Farshad Abedi
Street address
Faculty of Pharmacy, East Gate of University Campus, Azadi Square
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Postal code

9177948954

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+98 51 3180 1100

Email
Abeditf@mums.ac.ir

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Mashhad University of Medical Sciences

Full name of responsible person
Mohsen Tafaghodi

Street address
Mashhad University of Medical Sciences, 3rd floor, Vice-Chancellor for Research and Technology, University of Medical Sciences, next to Hoveizeh Cinema, Daneshgah Street

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9138813944

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Email
vcresearch@mums.ac.ir

Web page address
https://v-research.mums.ac.ir/

Grant name

Grant code / Reference number

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

Title of funding source
Mashhad 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
Mashhad University of Medical Sciences

Full name of responsible person
Farshad Abedi

Position
Assistant professor

Latest degree
Specialist

Other areas of specialty/work
Medical Pharmacy

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Faculty of Pharmacy, East Gate of University Campus, Azadi Square

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Person responsible for scientific inquiries

Contact

Name of organization / entity
Mashhad University of Medical Sciences

Full name of responsible person
Farshad Abedi

Position
Assistant professor

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Person responsible for updating data

Contact

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Full name of responsible person
Farshad Abedi

Position
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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
Yes - There is a plan to make this available
Data Dictionary
Yes - There is a plan to make this available
Title and more details about the data/document
De-identified Individual Participant Data (IPD) that will be available for sharing with other researchers upon reasonable request after the study's completion and publication of the main results. This includes demographic information, complete responses to the questionnaires and other secondary outcomes. The final study protocol (approved by the ethics committee), Statistical Analysis Plan (SAP), informed consent form, final Clinical Study Report (CSR), SPSS analysis code, and data dictionary will also be shared.
When the data will become available and for how long
Access to data and documents will begin 12 months after the publication of the primary study results in a peer-reviewed journal and will be available for 5 years.
To whom data/document is available
Researchers and scientists affiliated with recognized academic, research, or healthcare institutions who have a valid research question and a specified analysis plan. Requests for purposes such as meta-analysis, validation of results, or other research projects will be considered.
Under which criteria data/document could be used
The data and documents can only be used for non-commercial, scientific research purposes. The requester must provide a brief research proposal (max 2 pages) outlining the scientific objectives, proposed analysis methodology, and a commitment to ethical use and source attribution. Data use must comply with ethical and privacy regulations, and results derived must be published in scientific formats (articles, conferences).
From where data/document is obtainable
Requesters can send their application along with a brief proposal in Persian or English to the official email address of the Principal Investigator at [Abeditf@mums.ac.ir]. The requester's name and institutional affiliation must be clearly stated.
What processes are involved for a request to access data/document
Upon receiving a request, the Principal Investigator and the study steering committee will review the proposal for its scientific and ethical merit. An initial response will be provided within 4 weeks. If preliminarily approved, a Data Transfer Agreement (DTA) outlining the terms of use will be executed. Following the signed DTA, the requested data/documents will be provided via a secure platform (e.g., encrypted cloud drive) within 2 weeks. The entire process may take 6 to 8 weeks.
Comments
All data will be completely de-identified before sharing. We reserve the right to revoke or restrict access in the event of potential abuse.