

# Short-term music listening effect on stress, salivary cortisol, and gut health in Indonesian young adults

|                                        |                                                   |                                                                                                                         |
|----------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Submission date</b><br>04/08/2026   | <b>Recruitment status</b><br>No longer recruiting | <input type="checkbox"/> Prospectively registered<br><input checked="" type="checkbox"/> Protocol                       |
| <b>Registration date</b><br>05/08/2026 | <b>Overall study status</b><br>Completed          | <input checked="" type="checkbox"/> Statistical analysis plan<br><input type="checkbox"/> Results                       |
| <b>Last Edited</b><br>05/08/2026       | <b>Condition category</b><br>Other                | <input type="checkbox"/> Individual participant data<br><input checked="" type="checkbox"/> Record updated in last year |

## Plain English summary of protocol

### Background and study aims

Stress can affect both mental and physical health, including the digestive system. Previous research suggests that listening to music may help reduce stress, but the effects of music on stress-related biological markers and gut health remain poorly understood.

This study aimed to investigate whether listening to Mozart's music for 30 minutes each day over four weeks could affect stress levels, salivary cortisol levels and self-reported gut health in healthy young adults.

### Who can participate?

Healthy adults aged 18 to 30 years who are either employed or studying at college or university.

### What does the study involve?

Participants were randomly assigned to one of two groups:

A music group that listened to a 30-minute playlist of Mozart sonatas every day for four weeks

A control group that sat quietly in silence for 30 minutes each day for four weeks

Participants completed questionnaires and provided saliva samples at the start of the study and after four weeks.

Researchers assessed salivary cortisol levels, perceived stress levels, gastrointestinal symptoms, stool consistency and mood.

### What are the possible benefits and risks of participating?

Participants may have benefited from improved relaxation and reduced stress. The findings may help improve understanding of the relationship between music, stress and gut health.

The risks associated with participation were expected to be minimal. Participants were required to spend 30 minutes each day listening to music or sitting quietly and to provide saliva samples and complete questionnaires.

Where is the study run from?  
Universitas Trisakti, Indonesia.

When is the study starting and how long is it expected to run for?  
April 2026 to June 2026.

Who is funding the study?  
Investigator initiated and funded.

Who is the main contact?  
Dr Armelia Sari Widyarman, armeliasari@trisakti.ac.id

## Contact information

### Type(s)

Public, Scientific

### Contact name

Mr Swiluva Sigalovada Swilly Sumardy Ma

### ORCID ID

<https://orcid.org/0009-0002-5773-1093>

### Contact details

Tzu Chi School, Jl. Pantai Indah Kapuk Boulevard Penjaringan  
North Jakarta  
Indonesia  
14470  
+6282129830968  
swiluva250@gmail.com

### Type(s)

Scientific, Public, Principal investigator

### Contact name

Dr Armelia Sari Widyarman

### ORCID ID

<https://orcid.org/0000-0003-1435-2392>

### Contact details

Department of Microbiology, Division of Oral Biology, Faculty of Dentistry, Trisakti University  
Jl. Kyai Tapa 260, Grogol Petamburan  
West Jakarta  
Indonesia  
11440  
+62 811-929-379  
armeliasari@trisakti.ac.id

## Additional identifiers

# Study information

## Scientific Title

Short-term music listening effect on stress, salivary cortisol, and gut health in Indonesian young adults: a randomized controlled trial

## Study objectives

The objectives of this study were to analyze the effect of listening to music for 30 minutes daily over 4 weeks on salivary cortisol levels and stress level as well as self-reported gut health (gastrointestinal symptom severity and stool consistency) in young adults.

## Ethics approval required

Ethics approval required

## Ethics approval(s)

Approved 22/04/2026, Ethics Committee for Health Research, Faculty of Dentistry, Universitas Trisakti (Jl. Kyai Tapa 260, Grogol Petamburan, West Jakarta, 11440, Indonesia; +62 021-567 2731 ext. 1308, 1315; komisetikfkg@trisakti.ac.id), ref: 071/S3/KEPK/FKG/04/2026

## Primary study design

Interventional

## Allocation

Randomized controlled trial

## Masking

Blinded (masking used)

## Control

Active

## Assignment

Parallel

## Purpose

Basic science, Prevention

## Study type(s)

## Health condition(s) or problem(s) studied

Quantitative stress level analysis via salivary cortisol detection in volunteer young adults undergoing a music intervention.

## Interventions

- Participants will be randomized in a 1:1 ratio to the Mozart music or silence group using computer-generated block randomization (block sizes of 4 or 6), stratified by sex and baseline perceived stress score (PSS10 median split) to enhance group balance on key prognostic variables. Allocation concealment will be maintained through sequentially numbered opaque envelopes prepared by an independent researcher. Outcome assessors (laboratory technicians processing salivary cortisol samples and the statistician conducting final analyses) will be fully

blinded to group assignment. Participants and the research coordinator cannot be blinded due to the obvious difference between music listening and silence, but they will be explicitly instructed not to disclose group allocation during assessments.

- Mozart Music Intervention Group (n=30): Participants will listen to a standardized 30-minute playlist featuring Mozart sonatas (e.g., Sonata for Two Pianos in D Major, K.448; Piano Sonata No. 16 in C Major, K.545; and selected movements chosen for their structured, predictable tempo ranging 60–120 bpm). The playlist will be delivered via a secure mobile app or pre-loaded device with noise-isolating headphones at a comfortable volume level (50–60 dB, verified with a sound-level meter). Sessions must be completed daily at a consistent time of day (preferably during a relaxed period, e.g., evening), in a quiet environment.
- Silence Control Group (n=30): Participants will sit quietly for 30 minutes daily with no auditory input (no music, podcasts, conversations, or other stimuli). They will use the same timing app for consistency but will be instructed to maintain complete silence.

## **Intervention Type**

Behavioural

## **Primary outcome(s)**

1. Salivary cortisol levels measured using competitive enzyme-linked immunosorbent assay (ELISA) at baseline (week 0) and week 4 (within 48 hours after the final session)

## **Key secondary outcome(s)**

1. Perceived stress score measured using the Perceived Stress Scale - 10 (PSS-10) at baseline (week 0) and week 4
2. Gastrointestinal symptom severity measured using the Gastrointestinal Symptom Rating Scale (GSRS) at baseline (week 0) and week 4

## **Completion date**

22/06/2026

# **Eligibility**

## **Key inclusion criteria**

1. Generally healthy young adults aged 18–30-years old
2. Employed or student undertaking a college degree

## **Healthy volunteers allowed**

Yes

## **Age group**

Adult

## **Lower age limit**

18 Years

## **Upper age limit**

30 Years

## **Sex**

All

### **Total final enrolment**

60

### **Key exclusion criteria**

1. Antibiotic or probiotic/prebiotic use within the past 3 months
2. History of chronic gastrointestinal disorders (e.g., IBS, IBD)
3. Current smoking
4. Diagnosed hearing impairment
5. Professional musical training
6. Pregnancy
7. Use of corticosteroids or medications known to significantly affect cortisol levels
8. Any condition likely to confound stress or gastrointestinal symptom reporting

### **Date of first enrolment**

25/04/2026

### **Date of final enrolment**

24/05/2026

## **Locations**

### **Countries of recruitment**

Indonesia

## **Sponsor information**

### **Organisation**

Universitas Trisakti

### **ROR**

<https://ror.org/019fnr381>

## **Funder(s)**

### **Funder type**

### **Funder Name**

Investigator initiated and funded

## **Results and Publications**

# Individual participant data (IPD) sharing plan

## IPD sharing plan summary

Not expected to be made available

## Study outputs

| Output type                                   | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|-----------------------------------------------|---------|--------------|------------|----------------|-----------------|
| <a href="#">Participant information sheet</a> |         |              | 04/08/2026 | No             | Yes             |
| <a href="#">Protocol file</a>                 |         |              | 04/08/2026 | No             | No              |
| <a href="#">Statistical Analysis Plan</a>     |         |              | 04/08/2026 | No             | No              |