ISRCTN11010971 https://doi.org/10.1186/ISRCTN11010971

# A study to understand chewing and swallowing difficulties in older adults using a simple video-based method

**Submission date**
17/04/2025

**Recruitment status**
No longer recruiting

**Registration date**
17/04/2025

**Overall study status**
Completed

**Last Edited**
12/05/2025

**Condition category**
Digestive System

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

## Plain English summary of protocol

Background and study aims
Chewing and swallowing difficulties (dysphagia) are common but frequently underdiagnosed in older adults. This study aims to develop a non-contact, video-based screening approach to detect early signs of dysphagia by analyzing mandibular (jaw) movement and diadochokinetic (DDK) speech performance.

Who can participate?
Older adults aged 65 to 95 years who are capable of following instructions and performing basic oral motor tasks

What does the study involve?
Participants are asked to perform jaw opening and closing movements and to rapidly repeat the syllables /pa/, /ta/, and /ka/ in a single breath. These tasks are recorded using non-contact video and audio equipment. The recordings are analyzed to extract features such as jaw movement velocity and DDK rate.

What are the possible benefits and risks of participating?
Participants may gain early awareness of potential chewing and swallowing difficulties. The procedures involve minimal risk and are similar to routine speech and movement assessments.

Where is the study run from?
The study is led by researchers from the Department of Sports Medicine at Kaohsiung Medical University. Data were collected at selected community health and elder care centers in Kaohsiung City, Taiwan.

When is the study starting and how long is it expected to run for?
April 2022 to February 2023

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Dr Lan-Yuen Guo, yuen@kmu.edu.tw

# Contact information

### Type(s)
Public, Scientific, Principal Investigator

### Contact name
Mr Lan-Yuen Guo

### Contact details
No. 100, Shiquan 1st Rd
Sanmin Dist.
Kaohsiung City
Taiwan
807378
+886 (0)7 312 1101#2646
yuen@kmu.edu.tw

# Additional identifiers

### EudraCT/CTIS number
Nil known

### IRAS number

### ClinicalTrials.gov number
Nil known

### Secondary identifying numbers
Nil known

# Study information

### Scientific Title
To explore the correlation between chewing and swallowing difficulties during oral preparation in the elderly through non-contact imaging analysis of mandibular movement trajectory and oral movement rate

### Acronym
JAWS

### Study objectives
It is hypothesised that older adults with chewing and swallowing difficulties will demonstrate significantly different mandibular movement parameters (e.g., distance, angle, velocity) and diadochokinetic performance compared to those without such difficulties, as measured using non-contact video-based motion analysis and audio-based articulation assessment.

## Ethics approval required
Ethics approval required

## Ethics approval(s)
Approved 20/04/2022, Kaohsiung Medical University Chung-Ho Memorial Hospital Institutional Review Board (No. 100, Tzyou 1st Road, Kaohsiung, 807, Taiwan; +886 (0)7 3121101 ext 6646; irb@kmuh.org.tw), ref: KMUHIRB-E(II)-20210396

## Study design
Single-centre observational cross-sectional study

## Primary study design
Observational

## Secondary study design
Cross sectional study

## Study setting(s)
Charity/Voluntary sector, Community, Other

## Study type(s)
Screening

## Participant information sheet
Not available in web format, please use contact details to request a participant information sheet.

## Health condition(s) or problem(s) studied
Chewing and swallowing difficulties (dysphagia)

## Interventions
Participants will undergo non-contact video recording of mandibular movements during chewing tasks, and audio recording of diadochokinesis (/pa/, /ta/, /ka/) for speech motor assessment. Swallowing function is classified using the Repetitive Saliva Swallowing Test (RSST). No treatment or intervention is administered.

## Intervention Type
Behavioural

## Primary outcome measure
Mandibular movement parameters (average jaw opening/closing angle, distance, and velocity) and diadochokinetic rate (/pa/, /ta/, /ka/) are measured using non-contact video and audio analysis at a single timepoint

## Secondary outcome measures
1. RSST score measured using the Repetitive Saliva Swallowing Test at a single timepoint to classify participants into normal and impaired swallowing groups
2. Diadochokinetic rate (syllables per second) for /pa/, /ta/, and /ka/ syllables measured using the fixed-count method (10 and 15 syllables per trial) and maximum-performance method (maximum number of syllables in a single breath), based on audio recordings analyzed in

Audacity at a single timepoint
3. Average mouth opening distance measured using Kinovea software from non-contact video recordings at a single timepoint
4. Average mouth opening angle measured using Kinovea software from non-contact video recordings at a single timepoint
5. Average jaw opening velocity measured using Kinovea software from non-contact video recordings at a single time point
6. Average jaw closing velocity measured using Kinovea software from non-contact video recordings at a single timepoint

### Overall study start date
20/04/2022

### Completion date
17/02/2023

## Eligibility

### Key inclusion criteria
1. Community-dwelling older adults aged between 65 and 95 years
2. Able to complete the required speech and mandibular movement tasks correctly after a brief instruction session
3. No obvious impairment in lip closure, dentition (including the use of dentures), or jaw mobility
4. Able to open and close the mouth adequately without pain or discomfort
5. Willing to participate and provide written informed consent
6. Able to comply with the study procedures and complete all required recordings

### Participant type(s)
Healthy volunteer

### Age group
Senior

### Lower age limit
65 Years

### Upper age limit
95 Years

### Sex
Both

### Target number of participants
115

### Total final enrolment
100

### Key exclusion criteria

1. Presence of temporomandibular joint disorders (e.g., pain, limited range of motion, joint noise)
2. Neurological conditions that may affect orofacial motor control (e.g., Parkinson’s disease, stroke, ALS)
3. Severe cognitive impairment that affects the ability to understand instructions or perform the tasks
4. Recent oral surgery or facial trauma within the past 6 months
5. Unwillingness to participate or inability to complete the study protocol

### Date of first enrolment
20/04/2022

### Date of final enrolment
17/02/2023

## Locations

### Countries of recruitment
Taiwan

### Study participating centre
**Kaohsiung Medical University**
No. 100, Shiquan 1st Rd
Sanmin Dist.
Kaohsiung City
Taiwan
807378

## Sponsor information

### Organisation
Kaohsiung Medical University

### Sponsor details
No. 100, Shiquan 1st Rd
Sanmin Dist.
Kaohsiung City
Taiwan
807378
+886 (0)7 3121101
service@kmu.edu.tw

### Sponsor type
University/education

### Website

https://www.kmu.edu.tw/

**ROR**
https://ror.org/03gk81f96

# Funder(s)

**Funder type**
Other

**Funder Name**
Investigator initiated and funded

# Results and Publications

**Publication and dissemination plan**
Planned publication in a peer-reviewed journal

**Intention to publish date**
01/12/2025

**Individual participant data (IPD) sharing plan**
The data-sharing plans for the current study are unknown and will be made available at a later date

**IPD sharing plan summary**
Data sharing statement to be made available at a later date

**Study outputs**

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Other files | | | 17/04/2025 | No | No |
| Other files | | | 17/04/2025 | No | No |
| Protocol file | | | 17/04/2025 | No | No |
| Basic results | | 10/05/2025 | 12/05/2025 | No | No |