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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

[_] Prospectively registered

[X] Protocol

Registration date
17/04/2025

Overall study status
Completed

[_] Statistical analysis plan

[X] Results

Last Edited
20/10/2025

Condition category
Digestive System

[_] 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

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
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

Study type(s)

Screening

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(s)

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

Key secondary outcome(s))

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

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

Healthy volunteers allowed

No

Age group

Senior

Lower age limit

65 years

Upper age limit

95 years

Sex

All

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

ROR
https://ror.org/03gk81f96

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

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?
Results article		08/10/2025	20/10/2025	Yes	No
Basic results		10/05/2025	12/05/2025	No	No
Other files			17/04/2025	No	No

Other files	17/04/2025	No	No
Protocol file	17/04/2025	No	No