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Effectiveness of sign language-based cartoon oral health education for hearing-impaired children

Submission date
14/08/2025

Recruitment status
No longer recruiting

Registration date
18/08/2025

Overall study status
Completed

Last Edited
18/08/2025

Condition category
Oral Health

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
This study aimed to improve oral health awareness among hearing-impaired children. Many children with hearing impairments face challenges in understanding traditional health education. To address this, a 10-minute cartoon film was developed in Unified Arabic Sign Language that teaches children about teeth, common oral health problems, and good oral hygiene practices such as brushing, flossing, rinsing, and healthy diet habits. The film included animations, subtitles, sound effects, and clear sign language interpretation to make learning easier and more engaging.

Who can participate?
Children aged 6–12 years

What does the study involve?
Children in the study were randomly assigned to either the intervention group, who watched the educational film, or the control group, who received no film during the study period but were offered it afterwards. Oral health was measured using standard dental exams to check plaque and gingival health, and children also completed a questionnaire to assess their knowledge. Toothbrushes were given to all participants at the start. Assessments were conducted at the beginning, at six weeks, and at twelve weeks after the start.

What are the possible benefits and risks of participating?
Possible benefits: Children may benefit from improved knowledge of oral health and better oral hygiene practices. The educational film, adapted to their communication needs, provides accessible information that can help prevent oral diseases such as dental caries and gum disease.
Possible risks: The study involved minimal risk. Risks were limited to routine oral examinations (mild discomfort during plaque and gingival assessments). No invasive procedures were performed, and toothbrushes were provided to promote safe hygiene practices.

Where is the study run from?
Damascus University, Syria

When is the study starting and how long is it expected to run for?
January 2021 to April 2022

Who is funding the study?
Damascus University, Syria

Who is the main contact?
Dr Hasan Alzoubi, dr.hasan.alzoubi.93@gmail.com

Contact information

Type(s)
Scientific, Principal investigator

Contact name
Dr Alemar Ghannam

Contact details
Damascus University
Mazzeh
Damascus
Syria
0000
+963933173023
Alemar.ghannam.2222@hotmail.com

Type(s)
Scientific

Contact name
Prof Mayssoon Dashash

Contact details
Damascus University
Mazzeh
Damascus
Syria
0000
+963966956753
mdashash@yahoo.com

Type(s)
Public, Scientific

Contact name
Dr Hasan Alzoubi

Contact details
Damascus University
Mazzeh

Damascus
Syria
0000
+963943647659
dr.hasan.alzoubi.93@gmail.com

Additional identifiers

Protocol serial number
UDDS-2370-18042022/SRC-353

Study information

Scientific Title
A randomized controlled trial assessing the effectiveness of sign language-based cartoon oral health education on hearing-impaired children

Acronym
SLICE

Study objectives
To evaluate the impact of oral health education on increasing awareness among children with hearing impairments, and to explore the potential of modern technologies—specifically sign language-based cartoon films—in enhancing educational experiences, improving oral hygiene practices, and preventing oral diseases.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 18/04/2022, Biomedical Research Ethics Committee of Damascus University (University Presidency Building, University Campus, Baramkeh 23J89, Damascus, 00000, Syria; +963 1133923012; president@damasuniv.edu.sy), ref: 2370

Primary study design
Interventional

Study design
Single-center interventional randomized controlled trial

Study type(s)
Prevention

Health condition(s) or problem(s) studied
Oral health awareness and oral hygiene practices among children with hearing impairments
Prevention of dental caries and periodontal diseases

Interventions
Children in the intervention group received oral health education through a 10-minute sign language–based cartoon film titled "Oral Health", developed in Unified Arabic Sign Language

with subtitles, animations, and sound effects. The film was designed according to Mayer's Cognitive Theory of Multimedia Learning and covered topics such as tooth anatomy, functions, common oral diseases, and oral hygiene practices. It was shown on a laptop in short, engaging segments to minimize cognitive overload. The control group received no intervention during the study period but was offered the same educational film after completion. All participants underwent oral examinations at baseline, 6 weeks, and 12 weeks, with plaque and gingivitis assessed using the Silness–Löe indices. Toothbrushes were provided to all children at baseline.

Participants were randomly allocated into intervention and control groups using a computer-generated random sequence. Allocation concealment was achieved through sequentially numbered, sealed opaque envelopes prepared by an independent researcher not involved in recruitment or assessment.

Intervention Type
Behavioural

Primary outcome(s)
Oral health knowledge scoring measured using a structured questionnaire designed for hearing-impaired children at baseline and 12 weeks

Key secondary outcome(s)
Secondary outcome measures were assessed at baseline, 6 and 12 weeks:
1. Plaque accumulation measured using the Silness–Löe Plaque Index (PI)
2. Gingival health measured using the Silness–Löe Gingival Index (GI)

Completion date
30/04/2022

Eligibility

Key inclusion criteria
1. Children diagnosed with hearing impairment
2. Proficient in sign language sufficient to understand classroom instructions

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Child

Lower age limit
6 Years

Upper age limit
12 Years

Sex

All

Total final enrolment
90

Key exclusion criteria
1. Presence of systemic illnesses (neurological, cardiac, metabolic, or developmental disorders) that could interfere with communication, comprehension, or oral hygiene practices, as reported by parents and verified by medical records when available
2. Prolonged absence from school during the study period
3. Ongoing orthodontic treatment
4. Non-cooperative behavior, defined as a score of 1 (“definitely negative”) or 2 (“negative”) on the Frankl Behavior Rating Scale during the initial dental screening, based on caregiver interpretation and clinical observation

Date of first enrolment
14/02/2021

Date of final enrolment
23/07/2021

Locations

Countries of recruitment
Syria

Study participating centre
Department of Pediatric Dentistry
Damascus University, Mazzeh
Damascus
Syria
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Sponsor information

Organisation
Damascus University

ROR
https://ror.org/03m098d13

Funder(s)

Funder type
University/education

Funder Name
Damascus University

Alternative Name(s)
University of Damascus, , DU

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
Syria

Results and Publications

Individual participant data (IPD) sharing plan
Contact for dataset access: Dr Hasan Alzoubi, Damascus University (email: dr.hasan.alzoubi.93@gmail.com)
Type of data: De-identified participant-level data, including oral health questionnaire responses and clinical indices (Plaque Index, Gingival Index).
Timing of availability: Available upon request following publication of the primary study results, from 01/09/2025 onwards.
Consent: Written informed consent for participation and data use was obtained from caregivers /parents of all participants.
Data anonymization: All data will be de-identified and anonymized prior to sharing, in compliance with institutional and GDPR-equivalent standards.
Restrictions: Data sharing will require a data-sharing agreement and may be subject to additional ethical review.
Additional comments: Data will be provided in commonly used formats (Excel, CSV, SPSS) to facilitate secondary analyses.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet			18/08/2025	No	Yes