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Evaluation of the effectiveness of mobile-based virtual reality experiential learning in oral health education among primary school students in Tianjin

Submission date
13/07/2025

Recruitment status
No longer recruiting

Registration date
17/07/2025

Overall study status
Completed

Last Edited
29/10/2025

Condition category
Oral Health

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

Plain English summary of protocol

Background and study aims
This study is being run by the Tianjin Office for the Prevention and Control of Oral Diseases. It aims to find better ways to teach children about oral health using a virtual simulation learning platform. The goal is to see how well children learn when they go through the platform together with their parents.

Who can participate?
Children in grades 3 to 5 can take part, as long as they don't have vision or hearing problems that can't be helped with tools like glasses or hearing aids. A parent or guardian must also be involved in the learning process.

What does the study involve?
Parents will receive a QR code from their child's school. Scanning the code will take them to a virtual learning platform on their phone. Together with their child, they'll spend about 5 minutes learning about oral health. Later, the child will fill out a short questionnaire in class, which also takes about 5 minutes.

What are the possible benefits and risks of participating?
By taking part, families can learn more about how to take care of their teeth and gums, which may help children build good oral hygiene habits. The study also helps researchers improve oral health education. The only possible inconvenience is if there are technical issues with the phone or platform, but support will be available.

Where is the study run from?
The study is organized by the Tianjin Office for the Prevention and Control of Oral Diseases in China.

When is the study starting and how long is it expected to run for?
All learning and questionnaires are expected to be completed by December 2024. The learning can be done at any time that suits the family.

Who is funding the study?
The Medical Education Research Project of Medical Education Branch of Chinese Medical Association
Sichuan Science and Technology Program (China)

Who is the main contact?
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Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

Protocol serial number
Sichuan Science and Technology Program 2024YFHZ0079, Tianjin Science and Technology Planning Project 24KPHDRC00450, The Medical Education Research Project of Medical Education Branch of Chinese Medical Association 2023B175

Study information

Scientific Title
Evaluation of the effectiveness of mobile-based virtual reality experiential learning in oral health education among primary school students in Tianjin

Study objectives
The application of mobile VR improved students’ oral knowledge acquisition.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 25/11/2024, Medical Ethics Committee of Tianjin Stomatological Hospital (No. 75, Dagu North Road, Heping District, Tianjin, Tianjin, 300000, China; +8602259080681; skqyykjk@tj.gov.cn), ref: PH2024-Q-017

Study design
Single-center non-randomized controlled trial

Primary study design
Interventional

Study type(s)
Prevention

Health condition(s) or problem(s) studied
Oral Health Education among Primary School Students in Tianjin

Interventions
A convenience sampling approach was employed to recruit 1,416 children in grades 3–5 from 16 districts of Tianjin City who had previously received traditional oral health education. One week prior to the intervention, parents received a quick response code to access the VR experience and were instructed to guide their children through the smartphone-based learning module. Then, medical staff administered questionnaires to the students in the classroom.
The students who experienced the dental VR technology were assigned to the experiential group, while those who did not were classified as the control group, through convenient sampling.

Intervention Type
Behavioural

Primary outcome(s)
Oral health knowledge, attitudes, and technology acceptance measured using a questionnaire survey from December 1, 2024 to December 31, 2024 .

Key secondary outcome(s))
Basic characteristics of the students measured using a questionnaire survey from December 1, 2024 to December 31, 2024 .

Completion date
31/12/2024

Eligibility

Key inclusion criteria
1. Students currently enrolled in grades 3-5 of primary school and remaining in these grades during the survey period.
2.Students who are willing to participate in the study, and whose guardians have signed the

informed consent form.
3.Possessing basic reading comprehension and expression skills, and being able to cooperate in completing research procedures such as questionnaires.

Participant type(s)
Learner/student

Healthy volunteers allowed
No

Age group
Child

Lower age limit
8 years

Upper age limit
12 years

Sex
All

Total final enrolment
1472

Key exclusion criteria
1. Having severe cognitive impairments, mental illnesses, or other physical diseases that prevent normal participation in virtual learning or evaluations.
2. Sensory impairments (such as visual or hearing impairments) that cannot be improved with assistive tools, resulting in inability to effectively receive virtual simulation-based educational content.

Date of first enrolment
02/12/2024

Date of final enrolment
31/12/2024

Locations

Countries of recruitment
China

Study participating centre
Tianjin Stomatological Hospital
No. 75, Dagu North Road, Heping District, Tianjin
Tianjin
China
300000

Sponsor information

Organisation
Tianjin Stomatological Hospital,School of Medicine, Nankai University

Funder(s)

Funder type
Government

Funder Name
Tianjin Science and Technology Planning Project,24KPHDRC00450

Funder Name
Sichuan Science and Technology Program,2024YFHZ0079

Funder Name
The Medical Education Research Project of Medical Education Branch of Chinese Medical Association, 2023B175

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon request from Shuai Nie, nieshuai1988@126.com

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		28/10/2025	29/10/2025	Yes	No