

Virtual reality balance training for primary school children

Submission date 26/06/2026	Recruitment status No longer recruiting	☐ Prospectively registered ☐ Protocol
Registration date 30/06/2026	Overall study status Completed	☐ Statistical analysis plan ☒ Results
Last Edited 15/09/2026	Condition category Other	☐ Individual participant data

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)

Public, Scientific, Principal investigator

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Additional identifiers

Study information

Scientific Title

Effectiveness of virtual reality-based balance training in primary school children: a randomized controlled trial

Study objectives

To compare the effects of immersive virtual reality-based balance and coordination training with conventional balance and coordination training on dynamic balance, static postural stability, and motor coordination in primary school children.

Ethics approval required

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Ethics approval(s)

Approved 06/06/2025, Ethics Committee of Shanxi Engineering Vocational College (No. 40, Xutan East Street, Xiaodian District, Taiyuan, 030013, China; +86 13770306847; 3802541950@qq.com), ref: SEVC-2025-063

Primary study design

Interventional

Allocation

Randomized controlled trial

Masking

Blinded (masking used)

Control

Active

Assignment

Parallel

Purpose

School-based physical education and exercise training to improve balance and motor coordination in primary school children.

Study type(s)

Health condition(s) or problem(s) studied

Balance and motor coordination in healthy primary school children

Interventions

Following eligibility screening, participants were randomly allocated in a 1:1 ratio to either the virtual reality training group or the conventional training group. The randomisation sequence was generated using Microsoft Excel. Within sex strata, random numbers were generated using the RAND() function, and participants were allocated in blocks of six. Allocation was implemented by the study team using sequentially numbered, opaque, sealed envelopes. Both programmes were delivered in a school-based physical education setting over 6 weeks, with three supervised 30-minute sessions per week. Each session included a warm-up, a core training period, and a cool-down. The virtual reality group completed 5 minutes of warm-up, 20 minutes of immersive interactive balance and coordination training using the HTC Vive Cosmos system, and 5 minutes of virtual relaxation and stretching. The conventional training group completed 5 minutes of warm-up, 20 minutes of conventional balance, coordination, and body-

control exercises, followed by 5 minutes of static stretching and breathing exercises. The same instructor supervised all sessions and monitored safety, attendance, and completion of the scheduled sessions.

The Y-Balance Test composite score was calculated from maximal reach distances in the anterior, posteromedial, and posterolateral directions, normalised to limb length. Higher scores indicate better dynamic balance performance. A single-leg stance test with eyes closed was assessed as the time, in seconds, that participants maintained a single-leg stance with eyes closed, with a maximum cut-off of 60 seconds. Longer duration indicates better static postural stability. One-minute rope skipping were assessed as the number of rope-skipping repetitions completed within one minute. Higher counts indicate better performance.

Intervention Type

Behavioural

Primary outcome(s)

1. Dynamic balance performance measured using the Y-Balance Test composite score at baseline and immediately after the 6-week intervention

Key secondary outcome(s)

1. Static postural stability measured using a single-leg stance test (seconds) with eyes closed at baseline and immediately after the 6-week intervention

2. Motor coordination and rhythmic movement performance measured using the number of rope-skipping repetitions completed within one minute at baseline and immediately after the 6-week intervention

Completion date

14/11/2025

Eligibility

Key inclusion criteria

1. Primary school children who were eligible to participate in school-based physical education activities
2. No history of vestibular disorders, neurological diseases, or lower-limb injuries within the past 6 months
3. Ability to stand independently for at least 10 minutes
4. Willingness to complete all training sessions and post-intervention assessments
5. Written informed consent provided by parents or legal guardians

Healthy volunteers allowed

Yes

Age group

Child

Lower age limit

8 Years

Upper age limit

10 Years

Sex

All

Total final enrolment

132

Key exclusion criteria

1. Contraindications to virtual reality use, such as epilepsy or severe motion sickness
2. Participation in structured balance or coordination training programmes within the previous 3 months
3. Inability to complete the post-intervention assessments
4. Adverse symptoms during training that made continued participation inappropriate

Date of first enrolment

01/09/2025

Date of final enrolment

01/09/2025

Locations

Countries of recruitment

China

Sponsor information

Organisation

Gdansk University of Physical Education and Sport

ROR

<https://ror.org/03rq9c547>

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?
Results article		18/08/2026	15/09/2026	Yes	No