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Can school-based motor skill activities improve motor skills and wellbeing in children with motor difficulties?

Submission date	**Recruitment status**	[X] Prospectively registered
24/08/2026	No longer recruiting	[ ] Protocol
Registration date	**Overall study status**	[ ] Statistical analysis plan
25/08/2026	Ongoing	[ ] Results
Last Edited	**Condition category**	[ ] Individual participant data
26/10/2026	Other	[X] Record updated in last year

Plain English summary of protocol

Background and study aims

Some children have difficulties learning and performing movement skills such as balancing, jumping, running, throwing and catching. These motor difficulties can make it harder for children to take part in physical activity and may also be related to lower physical fitness, reduced confidence and challenges in wellbeing. Schools are an important place to provide support because children with motor difficulties usually learn alongside other children in mainstream classes.

The MoDiSchool study will test a 18-week school-based programme designed to support children's motor skills. The main aim is to find out whether a short video-guided motor activity completed in the classroom on each school day can improve motor competence among children with motor difficulties. The study will also examine whether these children gain additional benefit from a weekly small-group motor skill session. Because the classroom activities are delivered to the whole class, the study will also examine whether they benefit children more generally.

Who can participate?

Children in Grades 1-3 attending participating mainstream primary schools in Central Finland can take part. Participation requires written consent from a parent or legal guardian and age-appropriate assent or consent from the child. All consenting children in participating classes can take part, regardless of their level of motor competence.

What does the study involve?

About 24 schools, 90 classes and 1200 children will participate. At the beginning of the study, children's motor competence will be assessed. Children scoring within the lowest 15% on the age-standardised KTK3+ motor competence assessment will be classified as having motor difficulties for the study analyses and for eligibility for additional small-group support in one intervention group.

Schools will be randomly allocated to one of three groups. In the first group, all participating children will complete an approximately 10-minute video-guided motor activity on each school day for 18 weeks. In the second group, all children will receive the same classroom programme,

and children identified as having motor difficulties will also take part in one 60-minute researcher-led small-group motor skill session each week. Schools in the third group will continue their usual activities during the study and will receive the MoDiSchool intervention materials after the final follow-up.
Children will be assessed at the beginning of the study, approximately 5 months later after the intervention, and 12 months after the beginning of the study. Assessments include motor competence, physical activity, physical fitness, children's perceptions of their motor competence and physical activity abilities, and psychosocial wellbeing.

What are the possible benefits and risks of participating?
Children may benefit from additional opportunities to practise movement skills and be physically active, although individual benefit cannot be guaranteed. The activities are similar to physical activities normally undertaken during the school day and physical education. Possible temporary effects include tiredness, muscle soreness or minor injury during physical activity. Some children may also experience discomfort or anxiety during assessments or activities. Activities will be adapted to children's abilities, and children may stop an activity or assessment at any time.

Where is the study run from?
The study will take place in primary schools in Central Finland and is coordinated by the Faculty of Sport and Health Sciences at the University of Jyväskylä, Finland, in collaboration with Jamk University of Applied Sciences.

When is the study starting and how long is it expected to run for?
Participant enrolment is expected to begin in late August 2026, and the final participant assessment is expected to be completed in October 2027.

Who is funding the study?
The study is funded by the Research Council of Finland through the Academy Programme for Sport Science and Physical Activity (ACTIVE).

Who is the main contact?
A/Professor Mikko Huhtiniemi, mikko.huhtiniemi@jyu.fi

Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Study information

Scientific Title
Effectiveness and implementation of universal classroom and targeted extracurricular motor skill interventions compared with usual school practice for improving motor competence among primary-school children with motor difficulties: a three-arm cluster-randomised controlled trial (MoDiSchool)

Acronym
MODISCHOOL

Study objectives
Primary objective:
To determine whether a 18-week universal video-delivered classroom motor skill intervention improves motor competence at the 5-month post-intervention assessment compared with usual school practice among primary-school children with motor difficulties

Key secondary objectives:
1. To determine whether adding a weekly targeted extracurricular motor skill session to the universal classroom intervention provides additional benefit for children with motor difficulties
2. To compare the combined universal classroom and targeted extracurricular intervention with usual school practice among children with motor difficulties
3. To examine the effects of the universal classroom intervention on motor competence in the whole participating cohort and whether intervention effects differ between children with and without motor difficulties
4. To examine intervention effects on physical activity, health-related fitness, perceived motor competence, physical activity self-efficacy and psychosocial wellbeing, and the maintenance of effects at 12 months
5. To evaluate intervention implementation in terms of acceptability, adoption, appropriateness, feasibility, fidelity and sustainability

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 21/11/2025, Human Sciences Ethics Committee (University of Jyväskylä) (PO Box 35, University of Jyväskylä, Jyväskylä, 40014, Finland; +358 (0)14 260 1211; tutkimusetiikka@jyu.fi), ref: 1502/13.00.04.00/2025

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Active

Assignment
Parallel

Purpose
Prevention

Study type(s)

Health condition(s) or problem(s) studied
Motor difficulties and low motor competence in primary-school children

Interventions
Participating schools will be randomised at the school level in an approximately 1:1:1 ratio after baseline assessments to one of three study conditions. Schools will be grouped into matched sets before allocation, and an independent statistician will generate the allocation sequence using a computer-based random-number algorithm.

Arm 1 - universal classroom intervention:
All participating children will complete an approximately 10-minute video-guided motor activity on each school day for 18 weeks. The classroom teacher will initiate the activity by playing the designated video, which provides instructions and guides the children through the activities. The programme targets locomotor, stability and object-control skills and components of physical fitness. Activities are progressive, adaptable to different skill levels and designed to require little or no additional equipment.

Arm 2 - universal classroom plus targeted extracurricular intervention:
All participating children will receive the same universal classroom intervention as Arm 1. In addition, children classified at baseline as having motor difficulties, defined as scoring within the lowest 15th percentile of age-standardised normative KTK3+ scores, will participate in one 60-minute researcher-led group motor skill session per week for 18 weeks. The targeted sessions provide more intensive and individually adaptable motor skill practice. Activities include balance, rhythm, agility, strength and hand-eye coordination and are adapted to children's motor challenges and skill levels.

Arm 3 - waitlist control:
Participating schools will continue their usual educational, physical education and physical activity practices during the intervention and follow-up period. They will not receive the MoDiSchool intervention during this period. After completion of the 12-month follow-up assessments, waitlist schools will receive access to the classroom videos and materials for the targeted extracurricular programme.

Outcome assessments will be conducted at baseline, approximately 5 months after baseline immediately following the 18-week intervention, and 12 months after baseline.

Intervention Type

Behavioural

Primary outcome(s)
1. Motor competence measured using Körperkoordinationstest für Kinder 3+ (KTK3+) total score at baseline, 5 months after baseline (primary endpoint) and 12 months after baseline

Key secondary outcome(s)
1. Physical activity measured using hip-worn ActiGraph GT3X+ accelerometers worn for 7 consecutive days at baseline, 5 and 12 months

2. Cardiorespiratory fitness measured using the 20-m shuttle run test at baseline, 5 and 12 months

3. Muscular fitness measured using handgrip strength and standing broad jump at baseline, 5 and 12 months

4. Body mass index measured using standardised measures for height and body mass at baseline, 5 and 12 months

5. Perceived motor competence and physical fitness measured using Finnish questionnaire for perceived physical functioning at baseline, 5 and 12 months

6. Physical activity self-efficacy measured using the Children's Self-Perceptions of Adequacy in and Predilection for Physical Activity (CSAPPA) questionnaire at baseline, 5 and 12 months

7. Psychosocial wellbeing measured using the guardian-reported Strengths and Difficulties Questionnaire (SDQ) at baseline, 5 and 12 months

8. Intervention implementation (acceptability, adoption, appropriateness, feasibility, fidelity and sustainability) measured using child and teacher questionnaires, intervention implementation records and teacher interviews at during and following the 18-week intervention

9. Psychosocial (mental) wellbeing measured using the World Health Organization-Five Well-Being Index (WHO-5) at baseline, 5 and 12 months

Completion date
29/10/2027

Eligibility

Key inclusion criteria
School-level criteria:
1. Mainstream primary schools in Central Finland
2. Provides education to children in Grades 1-3
3. At least two Grades 1-3 classes participate in the study
4. School agrees to participate and to school-level random allocation to any of the three study conditions

Child-level criteria:
5. Enrolled in Grade 1, 2 or 3 in a participating class
6. Written informed consent provided by a legal guardian

7. Age-appropriate written assent/consent provided by the child
8. Able to participate in the study assessments and ordinary school-based intervention activities

Motor difficulties are not required for enrolment in the overall trial. Baseline KTK3+ assessment will be used to identify the prespecified principal target population of children with motor difficulties.

Healthy volunteers allowed
Yes

Age group
Child

Lower age limit
6 Years

Upper age limit
10 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Special schools and schools with a specific educational focus are excluded
2. Children with a medical, neurological or physical condition that prevents safe participation in the study assessments or intervention activities, or substantially limits the valid completion or interpretation of the standardised motor competence assessment
3. No additional child-level exclusion criteria are prespecified beyond failure to meet the inclusion criteria

Date of first enrolment
26/08/2026

Date of final enrolment
22/11/2026

Locations

Countries of recruitment
Finland

Sponsor information

Organisation
University of Jyväskylä

ROR
https://ror.org/05n3dz165

Funder(s)

Funder type

Funder Name
Research Council of Finland

Alternative Name(s)
Academy of Finland, Suomen Akatemia, Finlands Akademi, AKA

Funding Body Type
Government organisation

Funding Body Subtype
Research institutes and centers

Location
Finland

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon reasonable request from Mikko Huhtiniemi (mikko.huhtiniemi@jyu.fi).

De-identified individual participant data underlying the reported study results may be shared after publication of the main trial results. Data potentially available for sharing will include de-identified participant-level data from the motor competence, physical activity, physical fitness, questionnaire and psychosocial outcome measures, together with relevant variable descriptions and documentation needed to interpret the data.

Access will not be open or automatic because the study involves children and includes potentially sensitive information. Requests will be considered on a case-by-case basis and will require a scientifically justified research purpose and a clearly specified analysis plan. Data will be shared only with appropriately qualified researchers and only where the proposed use is consistent with the original informed consent, ethical approval, applicable data-protection legislation and institutional requirements. Where required, a data-sharing agreement or other institutional approval will be completed before access is granted.

Only data that have been anonymised or de-identified to an extent appropriate for sharing will be provided. Direct identifiers will not be shared, and additional variables may be removed, aggregated or otherwise modified where necessary to minimise the risk of participant

identification. Data will not be shared where anonymisation cannot adequately protect participant confidentiality or where ethical, legal or consent-related restrictions prohibit sharing.

Data are expected to become available after publication of the primary trial results and will remain available for the period permitted by the study Data Management Plan and applicable institutional data-retention requirements. Metadata, study protocols, research instruments and statistical analysis code will, where appropriate, be made openly available through the University of Jyväskylä JYX repository.

IPD sharing plan summary

Available on request