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Moving Maths: physically active maths lessons

Submission date
11/09/2018

Recruitment status
No longer recruiting

Registration date
01/03/2019

Overall study status
Completed

Last Edited
14/10/2022

Condition category
Other

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

Plain English summary of protocol

Background and study aims
It has been suggested that physical activity, and especially physical activity integrated into the school day, may be beneficial for attention, executive functions and school performance. The effects of prolonged physical activity interventions on children's learning are, however, largely unknown. This trial will act as a pilot study for a larger randomized controlled trial, which will examine the effects of physical activity integrated into academic lessons on learning outcomes, engagement and motivation and motor skills. This pilot study is an 8 week intervention and will examine the usability and the effectiveness of physically active math lessons. Children's and teachers' experiences will also be examined. We hypothesize that physically active math lessons will enhance children's enjoyment, learning motivation and learning outcomes.

Who can participate?
Third grade teachers and their classes

What does the study involve?
The design will involve comparison of three groups exposed to different teaching during math lessons:
1. Group 1 will receive physically active math lessons in which physical activity is integrated into learning goals
2. Group 2 will receive physically active math lessons with breaks including physical activity not related to learning goals
3. Group 3 are the control group and will receive typical, traditional math lessons.
The intervention lessons will be taught instead of regular math classes for a period of 8 weeks, while the control group will receive typical sedentary classroom lessons.
Children's math performance will be measured before, during and after the 8 weeks teaching period. Children's physical activity will be measured with accelerometers at baseline and during the intervention. Children's enjoyment, motivation and experiences will be measured with questionnaires and interviews. Teachers experiences will be measured with questionnaires and interviews.

What are the possible benefits and risks of participating?
This pilot study will increase the knowledge about the usability of teaching materials and different techniques increasing physical activity in a classroom. In addition, this study will increase the scientific understanding of the effects of physical activity on math learning and

motivation.
There are no known risks of participating in this study.

Where is the study run from?
LIKES Research Centre for Physical Activity and Health (Finland)

When is the study starting and how long is it expected to run for?
March 2017 to December 2018

Who is funding the study?
The Finnish Ministry of Education and Culture (Finland)

Who is the main contact?
Dr Heidi Syväoja
heidi.syvaoja@jamk.fi

Contact information

Type(s)
Scientific

Contact name
Dr Heidi Syväoja

Contact details
LIKES
JAMK University of Applied Sciences
Piippukatu 2
Jyväskylä
Finland
FI-40100
+358400248133
heidi.syvaoja@jamk.fi

Type(s)
Scientific

Contact name
Dr Tuija Tammelin

ORCID ID
https://orcid.org/0000-0002-1771-3977

Contact details
LIKES
JAMK University of Applied Sciences
Piippukatu 2
Jyväskylä
Finland

FI-40100
+358400247998
tuija.tammelin@jamk.fi

Additional identifiers

Protocol serial number
OKM/66/626/2016

Study information

Scientific Title
Moving Maths: a pilot study examining the effects of physically active maths lessons

Study objectives
Physically active maths lessons will enhance children's enjoyment, learning motivation and learning outcomes.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics Committee of the University of Jyväskylä, Finland, 28/08/2018 (no reference number available)

Primary study design
Interventional

Study design
Interventional cluster randomised controlled trial

Study type(s)
Quality of life

Health condition(s) or problem(s) studied
School-based physical activity

Interventions
This is a cluster-randomized controlled trial, in which five third grade teachers are invited to participated into the study. Volunteers are randomly assigned to use different teaching methods by using lottery. Before randomisation, children in teachers' classes are invited to participate into the study, and the intervention group, in which they belong to, is determined by the randomisation of teachers.
The design will involve comparison of three groups exposed to different teaching during math lessons:
1. Intervention group 1: Physically active maths lessons, in which physical activity is integrated into learning goals (improving the automatisation of basic arithmetic skills such as addition, subtraction and multiplication through active learning games and tasks)
2. Intervention group 2: Physically active maths lessons with breaks including physical activity not related to learning goals (breaks that include physical activities that increase the heart rate

and train motor skills)
3. Intervention group 3: Control group: usual maths lessons
The classes will be randomly assigned to Intervention Group 1 (n=25 pupils), intervention Group 2 (n=25 pupils), or control Group 3 (n=25 pupils). The intervention lessons will be taught instead of regular maths classes for a period of eight weeks, while the control group will receive typical sedentary classroom lessons.
There will be no follow-up period.

Intervention Type
Behavioural

Primary outcome(s)
Math performance, assessed using a math test including additions, subtractions, multiplications and divisions at the baseline, during and after the intervention.

Key secondary outcome(s)
1. Physical activity, assessed:
1.1. Objectively using accelerometers at the baseline and during the intervention
1.2. Subjectively using questionnaires (custom-made for the study) at baseline
1.3. The parent or the child's main caregiver will complete a questionnaire (custom-made for the study) concerning children's physical activity at the baseline
2. Children's experiences about the physically active math lessons, assessed using an interview after the intervention
3. Children's own competence and motivation in mathematics and enjoyment of math classes, assessed using questionnaires (custom-made for the study) at the baseline and after the intervention
4. Teacher's own competence and enjoyment to keep a physically active math lesson, assessed using a diary filled in by the teachers after every math class
5. Children's motivation, concentration and peaceful learning environment, assessed using a diary filled in by the teachers after every math class
6. Teacher's experiences about the physically active math lessons, assessed using an interview after the intervention
7. Family background, assessed using a questionnaire (custom-made for the study) filled in by the parent or the child's main caregiver at the baseline
8. Children's learning difficulties, assessed using questionnaires (custom-made for the study) filled in by the teacher and the parent or the child's main caregiver at the baseline

Completion date
31/12/2018

Eligibility

Key inclusion criteria
Third grade students (mean age of 9 years)

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Child

Sex
All

Key exclusion criteria
N/A

Date of first enrolment
06/09/2018

Date of final enrolment
17/09/2018

Locations

Countries of recruitment
Finland

Study participating centre
LIKES Research Centre for Physical Activity and Health
Rautpohjankatu 8
Jyväskylä
Finland
FI40700

Sponsor information

Organisation
LIKES Research Centre for Physical Activity and Health

ROR
https://ror.org/03mahcv92

Funder(s)

Funder type
Government

Funder Name
Opetus- ja Kulttuuriministeriö

Alternative Name(s)
Ministry of Education and Culture, Finland

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Finland

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are not expected to be made available due to ethical restrictions, as the data contains information that could compromise research participant privacy/content, and due to pilot nature of the study and small sample size.

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	results	10/12/2020	14/01/2021	Yes	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes