

Can we improve children's motor skills in preschool?

Submission date 19/04/2016	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
Registration date 13/10/2016	Overall study status Ongoing	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
Last Edited 08/10/2025	Condition category Musculoskeletal Diseases	<input type="checkbox"/> Individual participant data

Plain English summary of protocol

Background and study aims

Children's motor skills (ability to move) seem to influence their well-being, learning ability and general health. Therefore, children with good motor skills are happier, better at learning and move more than children with poorer motor skills. Accordingly, better motor skills might help to reduce the risk of diseases triggered by an unhealthy lifestyle such as cardiovascular disease (heart and blood vessel disease) and diabetes. The aim of this study is to investigate the relationship between motor skills and other parts of the child's development. The study will also aim to find out whether a targeted effort in the preschools can improve the children's motor skills and whether that in turn will improve the children's health, well-being and cognitive function (mental processing).

Who can participate?

All children attending kindergarten in the municipality of Svendborg, Denmark.

What does the study involve?

Participating kindergartens are randomly allocated to one of two groups. Kindergartens in the first group take part in four to five weekly sessions of adult-controlled physical activities, each lasting 45 minutes, during which the children get their heart rates up and complete a range of exercises focusing on different areas. These include gross motor skills (big movements) including crawling, jumping, climbing and running; fine motor skills (small movements), such as holding a pencil or handling beads, co-ordination skills through dancing, catching and throwing; balance; improving vestibular sense (sense of balance and spatial orientation), tactile sense (sense of touch) and kinesthetic sense (a sense which helps detect body weight and position); and relaxation techniques, such as through child yoga. Each kindergarten has the freedom to develop specific activities following a basic course structure. Kindergartens in the second group continue a normal for the duration of the study. At the start of the study and then again after 6, 18 and 30 months, children in both groups have their motor skills assessed. Information is also collected throughout the study to monitor the children's development.

What are the possible benefits and risks of participating?

Participating children benefit from having their development closely monitored and having any problems investigated at an early stage, which may lead to better outcomes. There are no notable risks involved with participating.

Where is the study run from?

The study is run from the University of Southern Denmark and takes place in kindergartens in the municipality of Svendborg (Denmark)

When is the study starting and how long is it expected to run for?

December 2015 to July 2019

Who is funding the study?

1. Tryg Foundation (Denmark)
2. The Danish Chiropractors' Foundation (Denmark)

Who is the main contact?

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Contact information

Type(s)

Scientific

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Additional identifiers

Study information

Scientific Title

Effectiveness of a structured intervention for improving Motor skills in Danish PreSchool children: a randomised controlled trial

Acronym

MiPS

Study objectives

By introducing a motor skills focus to regular kindergarten activities, it is possible to improve the children's motor skills.

Ethics approval required

Ethics approval required

Ethics approval(s)

approved 13/01/2016, The Danish Health Research Ethics Committee system, Region Southern Denmark (Damhaven 12, Vejle, 7100, Denmark; +4576638221; komite@rsyd.dk), ref: S-20150178

Study design

Multi-centre cluster randomized controlled trial

Primary study design

Interventional

Study type(s)

Prevention

Health condition(s) or problem(s) studied

Motor skills

Interventions

Participating preschools are randomized, stratified by socioeconomic background (family-type (single parent, both parents etc.) and household income of the up-take area) to one of two groups

Intervention: At least four days a week (preferably five) participants take part in a minimum of 45-minutes of adult-initiated and adult-led activities, where all children participate. These activities challenge:

1. Motor function: This involves gross motor challenges such as creeping, crawling, running, jumping, hopscotch, jumping, climbing; fine motor challenges such as holding a pencil, handling small objects like beads and construction toys or catching insects; coordination exercises such as crawling exercises, cross-body movements, "Angels in the Snow", jumping jack and throwing, gripping and kicking exercises; and different dynamic and static balance exercises such as walking on a line and standing on one leg.
2. Sensing: The vestibular sense is stimulated for example by rolling, turning around, doing somersaults and swinging. The tactile sense is stimulated by touch from others, for example, in the form of massage and by touching various materials and objects of different size, shape and temperature. The kinaesthetic sense is stimulated by challenging the body's joints, muscles and tendons in different ways, for example, by bending, stretching and pushing, lifting objects of different weights and by fast and slow movements.
3. Relaxation: The children will also experience other types of physical stimulus, namely relaxation and unwinding. It can, for example, be through massage, children's yoga or similar. All pedagogues in the intervention pre-schools will go through a comprehensive competency development program aimed at improving the children's motor skills.

Control: Participants continue as usual for the duration of the study.

Participants in both groups are followed up at 6, 18 and 30 months and have their motor skills assessed. Information is also collected throughout the study to monitor the children's development.

Intervention Type

Behavioural

Primary outcome(s)

Gross and fine motor skills are measured using Movement Assessment Battery for Children (shuttle-run, 20m fast run and one-leg stance) at baseline, 6, 18 and 30 months

Key secondary outcome(s)

1. Perceived motor competence is measured using the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children at age six (last test before leaving pre-school)
2. Musculoskeletal disorder rate is measured through parent interviews via SMS every two weeks from baseline until study end. Additionally, ICD-10 diagnoses of persistent complaints (four weeks or more) will be made at an orthopaedic department as they occur throughout the study period
3. Physical activity is measured using axivity AX3 accelerometers (<http://axivity.com/products/ax3>) for six days at baseline, 6 months, 18 months and 30 months
4. General well-being is measured using the Strength and Difficulties Questionnaire, filled in electronically by both parents and teachers every six months from baseline
5. Language development is measured using Language assessment 3-6 which is administered by the preschool teachers at baseline and at school-start. The assessment battery consists of measures within two domains of language, i.e. oral language (Vocabulary, Comprehension, Communication strategies) and pre-literacy measures (Rhyme detection, Print awareness, Deletion and Letter identification)
6. Executive function is measured using three elements from Preschool Self-Regulation Assessment (balance beam, pencil tap and snack delay) at baseline, 6, 18 and 30 months

Completion date

01/07/2029

Eligibility

Key inclusion criteria

All children attending kindergarten in the municipality of Svendborg, Denmark

Participant type(s)

Healthy volunteer

Healthy volunteers allowed

No

Age group

Child

Lower age limit

3 years

Upper age limit

16 years

Sex

All

Total final enrolment

435

Key exclusion criteria

Does not meet inclusion criteria

Date of first enrolment

01/08/2016

Date of final enrolment

01/08/2018

Locations**Countries of recruitment**

Denmark

Study participating centre

University of Southern Denmark

Campusvej 55

Odense

Denmark

5230

Sponsor information**Organisation**

University of Southern Denmark

ROR

<https://ror.org/03yrrjy16>

Funder(s)**Funder type**

Charity

Funder Name

TrygFonden

Alternative Name(s)

Tryg Foundation

Funding Body Type

Private sector organisation

Funding Body Subtype

Trusts, charities, foundations (both public and private)

Location

Denmark

Funder Name

The Danish Chiropractors' Foundation

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		23/11/2021	20/07/2023	Yes	No
Results article		22/02/2022	20/07/2023	Yes	No
Protocol article	protocol	29/08/2017		Yes	No
Other publications		12/12/2021	20/07/2023	Yes	No