ISRCTN31930534 https://doi.org/10.1186/ISRCTN31930534

Evaluation of the Maths Champions programme

Submission date
05/02/2020

Recruitment status
No longer recruiting

Registration date
12/02/2020

Overall study status
Completed

Last Edited
17/01/2025

Condition category
Other

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

Plain English summary of protocol

Current plain English summary as of 23/10/2020:

Background and study aims
Maths skills at school entry are associated with later maths outcomes and general educational achievement. Also, attending pre-school, particularly a pre-school that does well at supporting early number development, is associated with better attainment throughout primary and secondary school. Despite this, many nursery staff do not feel confident in their own maths skills and have a lack of training on how to support children's maths development. The National Day Nurseries Association (NDNA) developed the Maths Champions programme with the aim of building the confidence and knowledge of nursery staff to support the development of children' s maths skills.

A previous research project found that children aged 3-4 years from nurseries that used the Maths Champions programme made two months additional progress in maths and language development, compared to children attending nurseries that didn't use the programme. However, the results of this project have to be looked at with caution, as many of the children who started taking part in the project moved nursery and so couldn't be assessed at the end of the project. Due to this, the Education Endowment Foundation has funded a second, larger project to evaluate the Maths Champions programme.

The main aim of this research project is to explore the impact of the Maths Champions programme on the maths skills of children aged 3 to 4 years who attend a nursery that uses the programme in the year before they start school. This project will also explore other outcomes, including children's language development before school entry, the confidence of nursery staff in teaching maths, and children's attainment at the end of reception year.

Who can participate?
Private, voluntary, independent, maintained, or state school-based nurseries, based in East Midlands or West Midlands, can take part in this project. Depending on interest, nurseries from other regions may also be involved. Nurseries must have at least 15 children who are due to start school in September 2022 and must not have used the Maths Champions programme before.

Parents/carers of children aged 3-4 years, who attend nursery for at least 15 hours a week and are due to start school in September 2022, will be invited to consent for their children to take part in the project.

What does the study involve?
Nurseries will be chosen at random to either use the Maths Champions programme during the 2021-22 school year or to continue with usual nursery provision. At nurseries that are allocated to use the programme, a staff member will be trained as a 'Maths Champion' and another staff member will be trained as a 'Deputy Maths Champion'. They will receive online training and support from NDNA to review, reflect on and improve practice and the confidence of staff to support children's maths development.

Children will be assessed using a child-friendly, computer-based assessment of maths and literacy/language in September–October 2021 and again in June-July 2022. Nursery staff will also be asked to complete some questionnaires at the start and end the project.

What are the possible benefits and risks of participating?
There are no anticipated risks in taking part in this project. There may be no direct benefit to taking part, though half of the participating nurseries will receive the Maths Champions programme for free during the project, which is designed to build the confidence and knowledge of nursery practitioners to support children's early maths development. These nurseries will receive training for members of staff nominated to be the 'Maths Champion' and 'Deputy Maths Champion'.

All participating nurseries, both those delivering the programme and those in the control group, will receive £500 to support their participation in the project.

Where is the study run from?
138 nurseries in East Midlands or West Midlands (approximately 96 private, voluntary, or independent nurseries and approximately 42 maintained or state school-based nurseries). Nurseries from other areas may be considered to take part, depending on how well recruitment goes.

When is the study starting and how long is it expected to run for?
July 2019 to November 2023
Who is funding the study?
Education Endowment Foundation (UK)

Who is the main contact?
Lyn Robinson-Smith (Scientific)
lyn.robinson-smith@york.ac.uk

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Previous plain English summary:

Background and study aims
Maths skills at school entry are associated with later maths outcomes and general educational achievement. Also, attending pre-school, particularly a pre-school that does well at supporting early number development, is associated with better attainment throughout primary and secondary school. Despite this, many nursery staff do not feel confident in their own maths skills and have a lack of training on how to support children maths development. The National Day

Nurseries Association (NDNA) developed the Maths Champions programme with the aim of building the confidence and knowledge of nursery staff to support the development of children' s maths skills.

A previous research project found that children aged 3-4 years from nurseries that used the Maths Champions programme made two months additional progress in maths and language development, compared to children attending nurseries that didn't use the programme. However, the results of this project have to be looked at with caution, as many of the children who started taking part in the project moved nursery and so couldn't be assessed at the end of the project. Due to this, the Education Endowment Foundation has funded a second, larger project to evaluate the Maths Champions programme.

The main aim of this research project is to explore the impact of the Maths Champions programme on the maths skills of children aged 3 to 4 years who attend a nursery that uses the programme in the year before they start school. This project will also explore other outcomes, including children's language development before school entry, the confidence of nursery staff in teaching maths, and children's attainment at the end of the reception year.

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There are no anticipated risks in taking part in this project. In terms of the benefits, half of the participating nurseries will receive the Maths Champions programme for free during the project, which is designed to build the confidence and knowledge of nursery practitioners to support children's early maths development. These nurseries will receive training for members of staff nominated to be the 'Maths Champion' and 'Deputy Maths Champion'.

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Lyn Robinson-Smith (Scientific)
lyn.robinson-smith@york.ac.uk

Study website
https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/maths-champions-effectiveness/

Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
Nil known

Study information

Scientific Title
Independent evaluation of Maths Champions in nursery settings to develop children's early numeracy: a two-armed cluster randomized controlled trial

Acronym
MC II

Study objectives
1. What is the impact of the Maths Champions programme, in comparison to usual early years setting provision, on the maths skills of pre-school children aged 3-4?
2. How effective is the Maths Champions programme at improving nursery practitioners' confidence in supporting children's maths development in comparison to the usual early years setting provision?
3. What is the impact of the Maths Champions programme, in comparison to usual early years setting provision, on the development of language (reading and phonological awareness) of pre-school children aged 3-4?
4. What is the impact of the Maths Champions programme, in comparison to usual early years setting provision, on the mathematical development of children at the end of the reception year, as measured by the mathematical early learning goal of the EYFSP?
5. What is the impact of the Maths Champions programme, in comparison to usual early years setting provision, on the literacy of children at the end of the reception year, as measured by the literacy early learning goal of the EYFSP?
6. What is the impact of the Maths Champions programme, in comparison to usual early years setting provision, on children's overall development and school readiness, as measured by whether the child achieved a good level of development in the EYFSP?

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 29/11/2019, the University of York Health Sciences Research Governance Committee (Department of Health Sciences, Department of Philosophy, Heslington, York, YO10 5DD; +44 01904323253; smh12@york.ac.uk), ref: HSRGC/2019/364/D

Study design
Two-arm cluster randomized controlled trial

Primary study design
Interventional

Secondary study design
Cluster randomised trial

Study setting(s)
Childcare/pre-school

Study type(s)
Other

Participant information sheet
Not available in web format, please use contact details to request a participant information sheet.

Health condition(s) or problem(s) studied
Maths skills of nursery children, literacy and language skills of nursery children

Interventions
Current interventions as of 23/10/2020:

A statistician at York Trials Unit (YTU), who is not involved in nursery recruitment, will randomize nursery settings, using a 1:1 allocation ratio, to one of the following trial arms:
1. Intervention arm which involves usual nursery provision plus the National Day Nurseries Association's (NDNA) Maths Champions programme.
2. Control arm which involves usual nursery provision

A dedicated computer program, MinimPy (Saghaei and Saghaei, 2011), will be used for randomization.
Minimization will be used to ensure balance across the trial arms of nursery type, nursery size, and the number of staff at the nursery holding a level 6/degree qualification in early years.

Settings allocated to receive NDNA's Maths Champions programme will implement the programme for approximately 7-8 months during the 2021/22 school year, before outcome testing in June/July 2022. As part of the programme, settings nominate a lead practitioner to be the 'Maths Champion'. Where possible, the nominated Maths Champion should be a graduate in early years. Where this is not possible, the nominated Maths Champion should be qualified to level 3 as a minimum. Settings also nominate a 'Deputy Maths Champion', who is qualified to at least level 3 in early years. Together they are supported by NDNA and provided with an online induction to the programme (1 hour in duration), access to 3 online training courses (up to 2 hours in duration), one-to-one support by phone or web-conference, audit tools and a wide range of resources. These are used together to review, reflect on and improve practice and the confidence of practitioners in the setting to support children's numeracy development. The Maths Champions programme is all online.

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1. Intervention arm which involves usual nursery provision plus the National Day Nurseries Association's (NDNA) Maths Champions programme.
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Settings allocated to receive NDNA's Maths Champions programme will implement the programme for approximately 7-8 months during the 2020/21 school year, before outcome testing in June/July 2021. As part of the programme, settings nominate a lead practitioner to be the 'Maths Champion'. Where possible, the nominated Maths Champion should be a graduate in early years. Where this is not possible, the nominated Maths Champion should be qualified to level 3 as a minimum. Settings also nominate a 'Deputy Maths Champion', who is qualified to at least level 3 in early years. Together they are supported by NDNA and provided with an online induction to the programme (1 hour in duration), access to 3 online training courses (up to 2 hours in duration), one-to-one support by phone or web-conference, audit tools and a wide range of resources. These are used together to review, reflect on and improve practice and the confidence of practitioners in the setting to support children's numeracy development. Nursery staff will also be asked to complete some questionnaires about their beliefs about nursery aged children and maths; confidence in helping nursery aged children learn maths; and confidence in own maths abilities at the end the project. The Maths Champions programme is all online.

Children attending the participating nurseries in both the intervention and control arm, whose parents have provided informed consent for participation, will undergo an assessment of their maths and literacy/language skills, by independent assessors, in September–October 2020 for baseline assessment and again in June-July 2021. These skills will be measured using the Assessment Profile on Entry for Children and Toddlers (ASPECTS) hosted by the Centre for Evaluation and Monitoring at Cambridge Assessment. ASPECTS is a child-friendly, computer-based assessment, designed to be used on a one-to-one basis with children aged 3-4 years old.

There is no additional follow-up but participants will consent to collection of their data from the Early Years Foundation Stage Profile, held by the National Pupil Database, completed when participating children are at the end of Reception year (aged 4-5 years) to assess the long term impact of the intervention on personal, social and emotional development; physical development; communication and language; mathematics; and literacy. This profile is created for all reception year school pupils regardless of study participation. The profile contains data on early learning areas of mathematics and literacy, as well as whether or not each participating child achieved a 'good level of development' as rated by their teachers as meeting the expected level of development in the above areas of learning.

Intervention Type
Behavioural

Primary outcome measure
Current primary outcome measure as of 23/10/2020:

Early maths skills, measured using the Assessment Profile on Entry for Children and Toddlers (ASPECTS; hosted by the Centre for Evaluation and Monitoring at Cambridge Assessment) at the start (baseline) and end of the 2021-22 school year (follow up). Assessment conducted by independent assessors at follow up only

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Previous primary outcome measure:

Early maths skills, measured using the Assessment Profile on Entry for Children and Toddlers (ASPECTS) hosted by the Centre for Evaluation and Monitoring at Cambridge Assessment, at baseline and 9 months

Secondary outcome measures
Current secondary outcome measures as of 23/10/2020:

1. Literacy and language skills (reading and phonological awareness) measured using ASPECTS at the start (baseline) and end of the 2021-22 school year
2. Practitioner confidence and beliefs, assessed at the end of the 2021-22 school year using a short survey adapted from Chen et al. (2014) that covers: beliefs about nursery aged children and maths; confidence in helping nursery aged children learn maths; and confidence in own maths abilities
3. Long-term impact on mathematics, literacy and whether children show a 'good level of development' at the end of the 2022-23 school year, measured by linking to data on teacher-ratings from the Early Years Foundation Stage Profile, held by the National Pupil Database

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Previous secondary outcome measures:

1. Literacy and language skills, measured using the reading and phonological awareness score from ASPECTS, at baseline and 9 months
2. Practitioner confidence and beliefs, assessed using a short survey adapted from Chen et al. (2014) that covers: beliefs about nursery aged children and maths; confidence in helping nursery aged children learn maths; and confidence in own maths abilities, at 9 months
3. Long-term impact on personal, social and emotional development; physical development; communication and language; mathematics; and literacy, measured by linking to data from the Early Years Foundation Stage Profile, held by the National Pupil Database, at 21 months

Overall study start date
12/07/2019

Completion date
30/11/2023

Eligibility

Key inclusion criteria
Current inclusion criteria as of 23/10/2020:

Nurseries:
1. A private, voluntary, and independent (PVI) provider based on non-domestic premises, a maintained nursery or a state school-based nursery (SN)
2. ≥15 children in the cohort who are due to start reception class in a primary school in September 2022
3. Not currently using the NDNA Maths Champions programme and has not done so in the past
4. Not currently taking part in the evaluation of the Department for Education's Early Years Professional Development Programme (see: https://www.suffolklearning.co.uk /suffolklearning_images/users/Early_Years_Team_CYP//2019-10-10-EYPDPInformationforsettings.pdf)
5. Agreement to all requirements outlined in the Information for Nurseries and Memorandum of Understanding document.
Children:

1. Aged 3 to 4 years
2. Due to start reception class in a primary school in September 2022
3. Currently attends nursery for ≥15 h/week
4. Anticipated to remain at the nursery for the duration of the trial by parents/carers
5. Completion of the trial pre-test
6. Consent to participation given by parent/carer
7. Attends an eligible recruited nursery

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6. Consent to participation given by parent/carer
7. Attends an eligible recruited nursery

Participant type(s)
Learner/student

Age group
Child

Lower age limit
3 Years

Upper age limit
4 Years

Sex
Both

Target number of participants
138 clusters (nursery settings) with approximately 10 children in each cluster. Approximately 1380 children in total.

Total final enrolment
1304

Key exclusion criteria
Current exclusion criteria as of 23/10/2020:

Children who practitioners consider to have significant special education need(s), disabilities, or English as an Additional Language where an extreme language barrier exists, that would prevent them from accessing the ASPECTS assessment and/or would be distressed through completing the assessment.

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Previous exclusion criteria:

Children who practitioners consider to have a significant special education need(s) that would prevent them from accessing the ASPECTS assessment and/or would be distressed through completing the assessment

Date of first enrolment
01/05/2021

Date of final enrolment
30/09/2021

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
York Trials Unit, Department of Health Sciences
Faculty of Sciences
ARRC Building - Lower Ground Floor
University of York
Heslington
York
United Kingdom
YO10 5DD

Sponsor information

Organisation

University of York

Sponsor details
Contracts & Sponsorship Manager
Research & Enterprise Directorate
University of York
RCH/120, Ron Cooke Hub
Heslington
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England
United Kingdom
YO10 5GE
+44 01904 328693
michael.barber@york.ac.uk

Sponsor type
University/education

Website
https://www.york.ac.uk/

Funder(s)

Funder type
Charity

Funder Name
Education Endowment Foundation

Alternative Name(s)
EducEndowFoundn, Education Endowment Foundation | London, EEF

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

Results and Publications

Publication and dissemination plan

The results of this trial will be submitted in a final report to the Education Endowment Foundation, who will publish the report on their website. Articles for educational journals may be written and presentations given at relevant conferences.

Intention to publish date
31/07/2023

Individual participant data (IPD) sharing plan
The datasets generated during and/or analyzed during the current study will be available upon request from the EEF data archive managed by the Office for National Statistics. Consent will be sought from participants for data to be stored in the EEF data archive.

IPD sharing plan summary
Stored in repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol in funder publication	02/11/2020		Yes	No
Funder report results			17/01/2025	Yes	No
Statistical Analysis Plan			17/01/2025	No	No