

A school-based intervention ('Girls Active') to increase physical activity levels among 11- to 14-year-old girls: cluster RCT

Deirdre M Harrington,^{1*} Melanie J Davies,^{1,2,3}
Danielle Bodicoat,^{1,4} Joanna M Charles,⁵
Yogini V Chudasama,¹ Trish Gorely,⁶
Kamlesh Khunti,^{1,3,4} Alex V Rowlands,^{1,2,7}
Lauren B Sherar,⁸ Rhiannon Tudor-Edwards,⁵
Thomas Yates^{1,2} and Charlotte L Edwardson^{1,2}

¹Diabetes Research Centre, University of Leicester, Leicester, UK

²National Institute for Health Research Leicester Biomedical Research Centre, Leicester, UK

³Leicester Diabetes Centre, University Hospitals of Leicester, Leicester, UK

⁴Collaboration for Leadership in Applied Health Research and Care East Midlands, Leicester, UK

⁵Centre for Health Economics and Medicines Evaluation, Bangor University, Bangor, UK

⁶Department of Nursing, School of Health, Social Care and Life Sciences, University of the Highlands and Islands, Inverness, UK

⁷Sansom Institute for Health Research, University of South Australia, Adelaide, SA, Australia

⁸School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, UK

*Corresponding author dh204@le.ac.uk

Declared competing interests of authors: Melanie J Davies and Kamlesh Khunti report personal fees from Novo Nordisk (Bagsværd, Denmark), Sanofi-Aventis (Paris, France), Eli Lilly and Company (Indianapolis, IN, USA), Merck Sharp & Dohme Corp. (Kenilworth, NJ, USA), Boehringer Ingelheim (Berkshire, UK), AstraZeneca (Cambridge, UK), Janssen Pharmaceutica (Beerse, Belgium), Servier (Suresnes, France), Mitsubishi Tanabe Pharma Corporation (Osaka, Japan) and Takeda Pharmaceuticals International Inc. (Osaka, Japan), and grants from Novo Nordisk, Sanofi-Aventis, Eli Lilly and Company, Boehringer Ingelheim and Janssen Pharmaceutica. Melanie J Davies and Kamlesh Khunti are National Institute for Health Research (NIHR) senior investigators. Outside the submitted work, Joanna M Charles reports grants from Public Health Wales. Charlotte L Edwardson reports grants from NIHR Public Health Research during the conduct of the study.

Published February 2019

DOI: 10.3310/phr07050

Scientific summary

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Public Health Research 2019; Vol. 7: No. 5

DOI: 10.3310/phr07050

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Scientific summary

Background

Physical activity (PA) levels in young people in the UK have been declining, with recent data showing that only 16% and 9% of girls aged 11 or 12 years and 13–15 years, respectively, are sufficiently active. In an effort to tackle the inactivity crisis, there have been calls to undertake school-based programmes. Robust evidence on school-based programmes targeting adolescents in the UK is lacking; much of the evidence comes from the USA or is based on programmes targeting younger children. The Girls Active school-based programme, previously developed and implemented by the Youth Sport Trust (YST) in the UK, aims to target adolescent girls' activity levels.

Objectives

The main aim was to investigate the effect of the Girls Active programme on adolescent girls' PA levels and to undertake a full economic analysis and process evaluation. The objectives were to:

- investigate whether or not Girls Active leads to higher levels of objectively measured moderate to vigorous intensity PA (MVPA) levels in adolescent girls compared with a control group at 14 months (primary outcome)
- investigate whether or not Girls Active has an impact on a range of exploratory secondary outcomes at 7 and 14 months (as listed in *Main outcome measures*)
- conduct a full economic analysis at 14 months, including calculating the costs of programme delivery
- conduct a full process evaluation.

Methods

Design

A two-arm cluster randomised controlled trial was conducted.

Setting

State secondary schools in the Midlands, UK.

Participants

Female pupils aged 11–14 years. Overall, 82 state secondary schools in the Midlands area that had pupils aged 11–14 years were invited to take part. Following written consent from the head teacher, all girls aged 11–14 years were provided with an information pack containing parent/guardian and participant information sheets and an opt-out consent form. Then, 90 girls [30 from each Key Stage 3 (KS3) year group] were randomly selected from those who did not return the opt-out consent form. Verbal assent was obtained from the girls before each of the measurement sessions.

Sample size

In order to detect a difference in MVPA between groups of 10 minutes per day [assuming a MVPA standard deviation (SD) of 18 minutes, a 90% power, a 0.05 level of statistical significance, a cluster size of 56 girls and an intraclass correlation of 0.1], the targeted sample size was 18 schools, increasing to 20 schools (10 schools per group) to allow for cluster attrition. To allow for a 30% loss to follow-up and non-compliance with accelerometer wear, a random sample of at least 80 girls per school were recruited.

Interventions

After all baseline measures were completed, the clusters (schools) were randomised to either receive Girls Active (the intervention) or to carry on with usual practice (the control). Randomisation (1 : 1) was stratified by school size (median number of pupils < 850 or \geq 850) and proportion of non-white pupils (median < 20% or \geq 20%).

Girls Active is an established programme, developed and implemented by the YST, that provides a support framework for schools to review and change their PA, physical education (PE) and school sport culture and practices. In order to do this, teachers complete a school self-review, attend initial training, receive resources, attend a peer review day to share knowledge of practice with other teachers, are offered in-person or telephone support through a hub school or from the YST and are provided with two instalments of capacity funding to coincide with the submission of two action plans. Lead teachers are asked to form a girls' leadership and peer marketing group to empower girls to influence PE, sport and PA in their school, increase their own participation, develop as role models and promote and market PE and sport to other girls. Schools randomised to the control arm were not given any specific guidance or advice and were assumed to carry on usual practice.

Main outcome measures

Data were collected at baseline, 7 and 14 months. The primary outcome measure was the change in MVPA level at 14 months, measured by the wrist-worn GENEActiv™ (Activinsights Ltd, Kimbolton, UK) accelerometer.

Secondary outcome measures were changes in:

1. overall PA level (average acceleration/day)
2. time spent on light PA
3. time spent sedentary
4. moderate to vigorous intensity PA level at 7 months
5. the proportion of girls meeting MVPA guidelines. Secondary outcomes 1–5 were measured objectively by an accelerometer
6. body mass index (BMI) z-score and body fat percentage
7. a range of psychosocial factors that may mediate changes in PA (including intentions and motivation to be active, attitudes, perceived family, peer and teacher social support for PA, perceptions of the school social and physical environment, PA self-efficacy and enjoyment, perceived importance of PA and physical self-perceptions), self-reported in a questionnaire.

The primary outcome analysis used the complete-case population. Sensitivity analyses were undertaken, in which different levels of accelerometer wear and the season in which data collection was carried out were considered. Prespecified subgroup analyses were also undertaken to investigate whether or not the programme had different effects depending on the baseline school (level of social deprivation and size) and pupil (ethnicity, estimated biological maturation stage and year group) characteristics.

Economic evaluation

Microcosting calculated the costs of delivering the programme over 1 school year from a local authority (school) perspective. A cost–consequences analysis was conducted from a public sector, multiagency perspective [community care, general practitioner (GP), local authority and school], which explored health-related quality of life and GP, school nurse and school counsellor use. Exploratory subgroup analyses assessed socioeconomic factors, such as age and the level of implementation.

Process evaluation

Qualitative and quantitative data were collected from training events and records. Interviews with lead teachers, control school teachers and programme staff were undertaken at 7 and 14 months. Focus groups with peer leaders and random subsamples of girls and boys were undertaken at 14 months at each Girls Active school.

Results

Recruitment

A total of 20 schools (10 randomised to the intervention arm and 10 to the control arm) and 1752 girls participated. Of these, 18 schools (including 10 in the intervention arm) agreed to be followed up at 7 months and 19 (including 10 in the intervention arm) agreed to be followed up at 14 months. Among the participating girls, the mean age was 12.8 years (range 11.4–14.7 years), 23.3% were of a non-white European ethnicity and the mean BMI z-score was 0.18 kg/m² (SD 1.3 kg/m²). At baseline, 1708 participants (96.8%) provided at least 2 days of valid accelerometer data. Complete accelerometer data were available for 1211 participants (69.1%) for the primary outcome analysis at the 14-month follow-up.

Primary outcome

There were no significant differences between the intervention and control groups in time spent on MVPA at 14 months in the complete-case [1.7 minutes/day, 95% confidence interval (CI) –0.8 to 4.3 minutes/day; $p = 0.178$], intention-to-treat (ITT) (1.6 minutes/day, 95% CI –0.6 to 3.9 minutes/day; $p = 0.158$) or per-protocol (1.7 minutes/day, 95% CI –1.2 to 4.5 minutes/day; $p = 0.246$) analyses. At 7 months, a significant difference of 2.4 minutes per day (95% CI 0.1 to 4.7 minutes/day; $p = 0.039$) of MVPA was found between the groups in the complete-case analysis, with a difference of 2.3 minutes per day (95% CI 0.2 to 4.3 minutes/day; $p = 0.028$) being found in the ITT analysis and 3.1 minutes per day (95% CI 0.9 to 5.4 minutes/day; $p = 0.005$) being found in the per-protocol analysis.

Secondary outcomes

At 7 months, significant differences between the groups were found in mean acceleration (1.39 mg, 95% CI 0.1 to 2.2 mg; $p = 0.030$), sedentary time during the after-school period (–4.7 minutes/day, 95% CI –8.9 to –0.6 minutes/day; $p = 0.026$), overall light PA time (5.7 minutes/day, 95% CI 1.0 to 10.5 minutes/day; $p = 0.018$) and light PA time on school days (4.5 minutes/day, 95% CI 0.25 to 8.75 minutes/day; $p = 0.038$). No other significant differences between the groups were found in the other PA-related secondary outcome measures or in body composition at 7 or 14 months.

At 7 months, a significant difference between the intervention group and control group was found in the levels of perceived importance, in favour of the control group, and a difference was found in levels of self-esteem, in favour of the intervention group. At 14 months, there were significant differences between the groups in levels of intention to be active, in how participants perceived their school physical environment and in the levels of confidence to be active, in favour of the control group. There was also a significant difference in the level of identified motivation, in favour of the intervention group, at 14 months. No other significant differences between the groups were found in the psychosocial outcomes at 7 or 14 months.

Subgroup analysis

At 7 months, among the white European and 'early maturer' participants, there was a significant difference in MVPA levels between the randomised groups of 3.1 minutes per day ($p = 0.017$) and 5.1 minutes per day ($p = 0.003$), respectively, favouring the intervention arm. At 14 months, in the large schools (with ≥ 850 pupils), there was a significant difference in MVPA levels between the randomised groups of 4.9 minutes per day ($p = 0.001$), favouring the intervention arm.

Health economics

The costs of the programme ranged from £2054 per school (£23/pupil) to £8545 per school (£95/pupil), based on 90 pupils receiving the intervention per school, with the least costly option being to absorb Girls Active strictly within curriculum hours. Using complete cases, in which participants had data on costs and outcomes, no statistically significant differences were found between the groups for Child Health Utility-9D utility index scores or for frequencies or costs of service use at 14 months. However, factors, such as results at baseline, school size and percentage of BME pupils, did have an effect.

Process evaluation

Teachers indicated that they felt positive about the Girls Active programme and all schools except one had implemented some changes within their school. However, teachers acknowledged that they had not implemented as many strategies and activities within the 14-month evaluation period as they had outlined in their action plans. Teachers did feel that what they had done with their school had made a difference to some girls in terms of engagement, motivation and attendance. Peer leaders indicated that they had enjoyed being involved and had learned new skills, whereas other girls in KS3 reported during the focus groups that they had not fully understood the programme. The reported challenges of implementation included the flexible nature of the programme, the lack of time to dedicate to the programme, other commitments, different school priorities and a lack of support from other staff and/or the senior leadership team. Teachers suggested that they would have benefited from more support straight after their training and that some dedicated help from other school staff or someone external to their school in delivering Girls Active would have been useful. Owing to the flexible nature of Girls Active, some guidance on timelines would also have been beneficial.

Conclusions

At 7 months, there was less of a decline in mean MVPA levels in the intervention group than in the control group. However, these changes were not sustained at 14 months in the complete-case analysis (our primary measure of effectiveness). The cost data collected showed that simply incorporating Girls Active into curriculum time was the least financially costly option. The flexible nature of the programme often created uncertainty and, because of the lack of milestone dates and issues with competing priorities, teachers often found that they prioritised other tasks in their workload. Overall, the Girls Active programme was considered to be worthwhile by teachers, but they did not achieve everything they set out to do. Although teachers felt that what they had done within the 14-month evaluation period had made a positive impact on girls' motivation, engagement and attendance, this was not reflected in any changes in self-reported views from the random sample of participants who were evaluated.

The cluster design, the use of an objective method of assessing PA levels, the gathering of cost data from diaries and a log that was codesigned by teachers and the research team and the gathering of views from a wide range of pupils are marked strengths that should be included in future trials. However, a narrower or more targeted evaluation sample may have yielded different results. Future interventions should consider how flexibility within a programme can be appropriately combined with the support that teachers require for effective and sustainable implementation. The Girls Active programme was viewed positively by teachers and pupils. Although it was designed to be flexible, future implementation may need to provide teachers with more support regarding how to implement certain activities during the programme and by providing strategies for teachers to engage more senior staff and to delegate to peer leaders. Capitalising on the opportunities of a flexible programme like Girls Active while also learning from the barriers and challenges that teachers face in supporting girls' PA is a priority for research and practice.

Trial registration

This trial is registered as ISRCTN10688342.

Funding

Funding for this study was provided by the Public Health Research programme of the National Institute for Health Research (NIHR). The YST funded the intervention. This study was undertaken in collaboration with the Leicester Clinical Trials Unit, a UK Clinical Research Collaboration-registered clinical trials unit in receipt of NIHR Clinical Trials Unit support funding. Neither the YST nor the NIHR Clinical Trials Unit had any involvement in the Trial Steering Committee, data analysis, data interpretation, data collection or writing of the report. The University of Leicester authors are supported by the NIHR Leicester–Loughborough Biomedical Research Unit (2012–17), the NIHR Leicester Biomedical Research Centre (2017–22) and the Collaboration for Leadership in Applied Health Research and Care East Midlands. These funders had no involvement in the Trial Steering Committee, the data analysis, data interpretation, data collection or writing of the report.

Public Health Research

ISSN 2050-4381 (Print)

ISSN 2050-439X (Online)

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This report

The research reported in this issue of the journal was funded by the PHR programme as project number 13/90/30. The contractual start date was in February 2015. The final report began editorial review in May 2017 and was accepted for publication in September 2017. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The PHR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the PHR programme or the Department of Health and Social Care. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the PHR programme or the Department of Health and Social Care.

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