A peer-led physical activity intervention in schools for adolescent girls: a feasibility RCT

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Scientific summary

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Background

Girls are less physically active than boys and the majority of adolescent girls in the UK do not meet government physical activity (PA) recommendations. Current intervention approaches have had limited success in increasing girls' levels of PA and new approaches are needed. Adolescents' peers (including their opinions, behaviours, support and norms) create an important and influential social system in which their PA occurs. However, peer-based interventions have been largely limited to older pupils mentoring younger pupils; these do not harness the potential power within close friendships of girls in the same school year. This research project aimed to evaluate the feasibility of the Peer-Led physical Activity iNtervention for Adolescent girls (PLAN-A), a peer-led PA intervention for Year 8 girls.

Objectives

The study comprised two phases: phase 1, refinement and piloting; and phase 2, a feasibility study. An a priori list of progression criteria was used to inform a decision to progress to a definitive trial.

The phase 1 objectives were to:

- adapt and refine A Stop Smoking In Schools Trial (ASSIST), a peer-led stop smoking intervention, to develop a peer-based training programme that focuses on promoting PA among Year 8 girls
- develop an intervention logic model.

The phase 2 objectives were to:

- estimate the recruitment rate of Year 8 girls and peer supporters (PSs) and monitor attendance at the PS training
- qualitatively examine the acceptability of the intervention to students, PS trainers, schools and parents, and identify necessary refinements
- report accelerometer and questionnaire data provision rates, examine data quality and explore the implications of missing accelerometer data
- estimate the potential effect of the intervention on daily accelerometer-derived moderate to vigorous physical activity (MVPA), secondary activity-related and psychological variables immediately after the intervention and 12 months after baseline
- estimate the school-related intraclass correlation for daily MVPA
- estimate the sample size for definitive trial evaluation
- identify and test the feasibility of collecting the data needed to cost the intervention and conduct a cost-effectiveness analysis in a definitive trial
- qualitatively examine parental views, data linkage and the completeness of data required to link participant data to educational attainment.

Methods

Phase 1

Formative, iterative, qualitative research ($n = 16$ participants) was conducted, comprising extensive public involvement to refine PLAN-A (i.e. PS training content and trainer characteristics, recruitment materials, study logo). One secondary school ($n = 70$, Year 8 girls) was recruited to conduct a pilot of PLAN-A, and a

qualitative and quantitative process evaluation was used to identify refinements before conducting the feasibility study in phase 2.

Phase 2

Study design

A two-arm cluster randomised controlled feasibility study in six secondary schools to compare PLAN-A (four schools) with a usual-practice control (two schools) was conducted, alongside a mixed-methods process evaluation and health economics evaluation (trial registration: ISRCTN12543546). Ethics approval was granted by the University of Bristol Ethics Committee.

Inclusion criteria

School eligibility criteria were state-maintained mainstream secondary schools located in Wiltshire and South Gloucestershire, with girls in Year 8 above the median of the local Pupil Premium, and not currently implementing the ASSIST intervention.

School and participant recruitment

Eligible schools ($n = 16$) were invited and those that expressed an interest were provided with study information and gave study consent. All Year 8 girls were invited to participate and were provided with young persons and parent information sheets and parent opt-out details. All adult participants (PS trainers, teachers and parents) provided written informed consent.

Measures

Measurements were taken at three time points:

- time 0 [T0 (baseline)] – the beginning of Year 8, September–October 2015
- time 1 [T1 (follow-up 1)] – the end of Year 8, May–June 2016
- time 2 [T2 (follow-up 2)] – the beginning of Year 9, September–October 2016 (T2 was the likely primary outcome point in a definitive trial).

At each time point, participants wore an accelerometer (ActiGraph GT3x+; ActiGraph, LLC, Pensacola, FL, USA) for 7 days and completed a questionnaire assessing psychosocial constructs and health-related quality of life. Following baseline data collection, six schools were randomly allocated, stratified at an intervention-to-control ratio of 2 : 1 within the local authority area (Wiltshire and South Gloucestershire). Two schools were allocated to the control arm and four schools were allocated to the PLAN-A arm.

A mixed-methods process evaluation was conducted. The process evaluation comprised observations of the PS training, post-intervention qualitative interviews and/or focus groups with students (PSs, non-PSs and control school pupils $n = 64$), PS trainers ($n = 5$), parents of PSs ($n = 12$) and school teachers ($n = 6$), quantitative PS and trainer evaluation surveys and assessment of school context (including school PA facilities and policy audits).

An economic evaluation aimed to assess the feasibility of collecting the data required to cost the intervention and conduct a cost-effectiveness analysis in a definitive trial and explore the affordability and potential cost-effectiveness of the intervention. Resource use was recorded and students' quality of life was assessed using the EuroQol-5 Dimensions, child-friendly version.

Data analysis

Quantitative data were analysed using appropriate descriptive summary statistics. School and student recruitment and retention through the study were presented as a Consolidated Standards of Reporting Trials (CONSORT) flow chart. Summary statistics for the (definitive trial) primary (i.e. weekday MVPA) and secondary outcomes (other PA and psychosocial outcomes) were presented, by intervention and control group according to the allocation of the student's school (i.e. an intention-to-treat analysis). The adjusted

differences in means between the intervention and control groups were estimated using mixed-effects linear regression and presented with their 95% confidence intervals (CIs). Sensitivity analyses were undertaken exploring implications of missing data and data imputation. Analyses were conducted in Stata® (version 15; StataCorp LP, College Station, TX, USA). Qualitative process evaluation data were analysed using the framework method, allowing comparison of the data from all stakeholders. Analyses were conducted in NVivo (version 10; QSR International, Warrington, UK). Quantitative process evaluation and health economic evaluation data were analysed using appropriate descriptive summary statistics.

Intervention

PLAN-A comprised (1) peer nomination, (2) recruitment and training of PS trainers, (3) PS training and (4) a 10-week informal peer diffusion period. Year 8 girls identified influential female peers in their year using a peer nomination questionnaire (i.e. who they respect, look up to, listen to) and the highest scoring 18% (those with most nominations) were invited to be PSs. Consenting PSs attended an initial 2-day course to develop the skills, knowledge and confidence to promote PA among their close peers. At the mid-point of the intervention (5 weeks), PSs attended a further top-up training day to revisit core messages, share successes and resolve problems. Training was held outside the school site and was led by external PS trainers who had attended a 3-day training programme. The training was informed by phase 1 findings and addressed issues central to girls' PA including PA benefits, active choices, developing an active identity, being active with friends, sedentary behaviour, communicating with confidence, empathy and supporting motivation. The content was grounded in self-determination theory. PSs then informally promoted messages about increasing PA among their peers for 10 weeks, with the top-up training at 5 weeks.

Results

Phase 1 resulted in the co-production of PLAN-A, which was successfully piloted among 70 Year 8 girls and 10 PSs and refined based on stakeholder input. The logic model was created. Key findings included changes to terminology, identification of important PS trainer characteristics, guidance on balancing active and less active learning and specific changes to PS training activities.

In phase 2, 427 Year 8 girls from six secondary schools were recruited (PLAN-A arm, $n = 269$; control arm, $n = 158$), reflecting a 95% recruitment rate. In total, 55 girls consented (96.49% of those invited) to be a PS and 94% attended all 3 training days. PS training was delivered by five females with experience of health promotion, sports coaching, youth work and theatre. PLAN-A was acceptable to students, teachers, trainers and parents. PSs engaged well with, and enjoyed, the training and reported various peer support strategies (encouragement, co-participation, knowledge-sharing, using empathy and being subtle). Refinements to PLAN-A were identified, including adding more active learning and group activities and providing more support on how to start conversations with peers.

Accelerometer return rates were high (> 85%) at each time point and the wear-time criteria were met by 82.63%, 71.13% and 62.21% of participants at T0, T1 and T2, respectively. Questionnaire data provision exceeded 90% at each time point. The three variables needed to perform linkage to education data (i.e. full name, date of birth and home postcode) were collected for 89% of students. The complete-case-adjusted regression analysis showed that there was no between-arm difference in weekday MVPA at T1. At T2, there was evidence for a between-arm difference in weekday MVPA in favour of the PLAN-A arm (6.09 minutes, 95% CI 1.43 to 10.76 minutes). This represented a prevention in the decline of weekday MVPA in the PLAN-A arm from the beginning of Year 8 to Year 9. Results of sensitivity analysis for which missing data were imputed were very similar to the complete-case analysis. There was no evidence that the intervention changed the psychosocial or quality-of-life variables. The economic evaluation showed that the information required to estimate the cost of the intervention could be collected and that, on average, PLAN-A cost £2685 per school to deliver (£37 per Year 8 girl). The cost per 10-minute increase in mean weekday MVPA was £61 per Year 8 girl at 12 months. Sample size calculations suggested that a definitive trial conducted with

20 schools and 1400 girls would be adequately powered to detect a between-arm difference in weekday MVPA of at least 6 minutes.

Conclusions

The PLAN-A trial is a feasible and acceptable school-based peer-led PA intervention for Year 8 girls. PLAN-A showed evidence of promise to positively affect girls' PA levels. The progression criteria were met, supporting further testing of PLAN-A effectiveness and cost-effectiveness in a definitive cluster randomised controlled trial.

Trial registration

This trial is registered as ISRCTN12543546.

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