

Bristol Girls Dance Project: a cluster randomised controlled trial of an after-school dance programme to increase physical activity among 11- to 12-year-old girls

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Scientific summary

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Background

Many children and adolescents do not do sufficient physical activity (PA); in particular, girls are less active than boys through to adulthood. Encouraging girls who do not meet the daily recommendations of PA to become more active would improve a number of physical and mental health outcomes. There are few studies that focus on ways in which to help girls become physically active. Dance is an activity that appeals to many girls and that could engage those with low activity levels in higher levels of PA. The Bristol Girls Dance Project (BGDP) (known locally as Active7) aimed to examine whether or not participating in an after-school dance programme positively affects the PA levels of Year 7 girls and whether or not such an approach is a cost-effective way by which to increase PA.

Objectives

The primary aim of the study was to determine the effectiveness of the BGDP intervention to improve the objectively assessed (accelerometer) mean weekday minutes of moderate- to vigorous-intensity physical activity (MVPA) per day among Year 7 girls 1 year after baseline (T2 = T0 + 52 weeks).

The secondary aims of the project were to:

1. determine the effectiveness of the intervention to improve the following outcomes among Year 7 girls at baseline (T0) + 52 weeks (T2):
 - mean weekend minutes of MVPA
 - mean weekday accelerometer counts per minute (CPM)
 - mean weekend accelerometer CPM
 - the proportion of girls meeting the recommended 60 minutes of MVPA per day
 - mean accelerometer-derived minutes of weekday sedentary time
 - mean European Quality of Life-5 Dimensions Youth survey (EQ-5D-Y) scores (a standardised instrument for measuring health outcomes)
 - programme costs (school-level) and mean participant costs
2. determine the effectiveness of the intervention during the intervention period (T1) on all primary and secondary outcome variables
3. determine the extent to which any effects on primary and secondary outcomes were mediated by autonomous and controlled motivation towards PA and perceptions of autonomy, competence and relatedness in PA. These mediators are informed by self-determination theory, the psychological theory of behaviour change on which our intervention is based
4. determine the cost-effectiveness/utility of the intervention from a public-sector perspective over the time frame of the study.

Methods

Inclusion criteria

Mainstream state secondary schools from Bristol, North Somerset, and Bath and North East Somerset councils were invited to participate. Schools were required to have at least 30 Year 7 girls and be able and willing to facilitate two after-school dance sessions per week for 20 weeks (January to June/July 2014).

Exclusion criteria

Special educational needs schools and schools designated as specialist dance academies were excluded. If we were unable to recruit ≥ 25 girls in a school, a replacement school was sought.

All relevant schools were invited to participate in the study. Visits were made to schools that expressed an interest to gain study consent. All Year 7 girls were offered a 'taster' dance session. Girls were provided with parent and child information sheets and participation was dependent upon return of a completed parental consent form.

If > 33 girls signed up in a school, girls were randomly ranked (via computer algorithm), with the first 33 being selected to participate. If girls withdrew from the study prior to baseline data collection they were replaced by the next child (in rank order). No replacements were allowed after baseline data collection.

We conducted three stages of measurements with all participant girls at the following times:

1. Time 0 [T0 (baseline)]: between September and November 2013.
2. Time 1 [T1 (weeks 17–20 of the intervention)]: June 2014.
3. Time 2 [T2 (T0 + 52 weeks)]: September to November 2014.

At each time point girls were asked to wear an Actigraph GT3x+ (Actigraph LLC, Pensacola, FL, USA) accelerometer for 7 days and to complete a psychosocial questionnaire and the EQ-5D-Y questionnaire. Girls' heights and weights were also measured.

After baseline measurements were taken, nine schools were randomly assigned to the intervention arm and nine were randomly assigned to the control arm. Balance between trial arms was achieved with respect to a school's local authority membership, mean minutes of participant MVPA at baseline per school, number of pupils in the school and level of deprivation (assessed as the percentage of pupils in the school eligible for the Department of Education's Pupil Premium).

Schools randomised to the intervention arm received a 20-week dance intervention, consisting of two 75-minute after-school sessions per week (up to 40 sessions overall). Dance sessions were led by external dance instructors who delivered a standardised programme in each school. Instructors attended a 1-day training programme before the intervention began and a half-day 'booster session' mid-way through the intervention period. The dance programme focused on building girls' perceived autonomy to be active and perceived dance competence in a social, mutually supportive environment. The programme provided exposure to a range of dance styles. Intervention girls each received a 'dance diary' to complete between sessions (the diaries were not analysed as part of the study).

Results

A total of 18 schools took part in the study, and 571 girls provided baseline data. Schools were randomised to intervention (schools, $n = 9$; girls, $n = 284$) and control (schools, $n = 9$; girls, $n = 287$) arms after baseline measures. Of the 571 girls who took part in baseline measures, 98.95% ($n = 565$) provided data at T1 and 97.90% ($n = 559$) provided data at T2.

An average of 31 girls signed up in each school. The nine intervention schools delivered between 37 and 40 of the planned sessions. Average attendance across the schools was 12 girls per session.

The primary intention-to-treat analysis found no evidence of a difference in the accelerometer-recorded MVPA of the two intervention arms at T2. There was no evidence of a difference in any other accelerometer-derived measure of PA, either while the intervention was running (T1) or at T2.

A per-protocol analysis was conducted using a complier average causal effect analysis. This analysis included all control school students and intervention girls who attended two-thirds of the total sessions in their school (i.e. 20/30 sessions). A total of 81 girls from the intervention arm were included in this analysis. There was no difference between trial arms at T1 or T2.

Conclusions

There was no evidence that the BGD had an effect on the primary or secondary PA outcomes. The intervention sessions were delivered in the nine intervention schools, with all schools receiving at least 37 of the planned 40 sessions. Attendance levels declined over the course of the intervention period. The girls who attended the sessions stated that they enjoyed them; however, perceived levels of exertion were low. There are lessons that were learnt from the process evaluation, which can be incorporated into future interventions to improve their effectiveness.

Trial registration

This study is registered as ISRCTN52882523.

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