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Abstract

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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Background: Many children do not meet UK physical activity (PA) guidelines. Girls are less active than boys, and the age-related decline in activity is steeper for girls. Dance is the favourite form of PA among adolescent girls in the UK. Participation in after-school dance classes could significantly contribute to girls' PA. Therefore, after-school dance may be effective for increasing PA levels.

Objectives: To determine the effectiveness and cost-effectiveness of a dance-based intervention to increase the objectively assessed mean weekday minutes of moderate- to vigorous-intensity physical activity (MVPA) of Year 7 girls (11- and 12-year olds) 1 year after baseline measurement.

Design: Two-arm cluster randomised controlled trial and economic evaluation. Year 7 girls in participant schools received a 'taster' session and were invited to participate. Up to 33 girls per school were able to participate. Schools were randomly assigned (equal numbers) to intervention or control arms.

Setting: A total of 18 mainstream secondary schools across greater Bristol.

Participants: Year 7 girls in participating schools who could participate in physical education.

Intervention: Nine intervention schools received an after-school dance intervention (40 × 75-minute sessions) underpinned by self-determination theory, which attempts to improve intrinsic motivation for being active, and delivered by external dance instructors. Control schools continued as normal.

Main outcome measures: The main outcome was accelerometer-assessed mean minutes of MVPA at T2. Measures were assessed at baseline (T0), the end of the intervention (T1) and at T0 + 52 weeks (T2).

Results: Baseline MVPA levels were high. A total of 508 girls were included in the primary analysis, which found no difference in weekday MVPA between trial arms. There was no effect on secondary accelerometer outcomes. Data were subjected to a per-protocol analysis and no effect was found. However, at T1, girls who attended dance classes had 4.61 minutes more of MVPA and 14.27 minutes more of light-intensity activity between 15.00 and 17.00 on the days on which they attended intervention sessions. The intervention was inexpensive at £73 per participant (£63 when excluding dance instructor travel) but was not cost-effective owing to the ineffectiveness of the intervention. The European Quality of Life-5 Dimensions Youth survey data were unresponsive to changes in the sample. The process evaluation reported that girls in attendance enjoyed the sessions, that exertion levels were low during sessions and that attendance was low and declined. Fidelity to the session-plan manual was low but theoretical fidelity (to self-determination theory) was good. Qualitative information provides information for improving future interventions.

Conclusions: The intervention was enjoyed by participants. However, there was no difference in the MVPA levels (which were high at baseline) of girls allocated to receive dance compared with girls receiving the control. High baseline MVPA levels indicate that the study appealed to an already active cohort and, therefore, may not have targeted those most in need of an intervention. Dance is an enjoyable activity for adolescent girls and could be further trialled as a means by which to increase PA. Research might consider the impact of dividing the intervention period into smaller blocks.

Trial Registration: Current Controlled Trials ISRCTN52882523.

Funding: The National Institute for Health Research Public Health Research programme. The work was also undertaken with the support of the Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement (DECIPHer), a UK Clinical Research Collaboration (UKCRC) PHR Centre of Excellence. Joint funding (MR/KO232331/1) from the British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, the Welsh Government and the Wellcome Trust, under the auspices of the UKCRC, is gratefully acknowledged. This study was designed and delivered in collaboration with the Bristol Randomised Trials Collaboration, a UKCRC Registered Clinical Trials Unit in receipt of NIHR Clinical Trials Unit support funding. All intervention costs were funded by the respective councils to which the participant schools were affiliated, namely North Somerset Council, Bristol City Council, and Bath and North East Somerset Council.

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List of abbreviations

AUC	area under the curve
BGDP	Bristol Girls Dance Project
BMI	body mass index
CACE	complier average causal effect
CI	confidence interval
CONSORT	Consolidated Standards of Reporting Trials
CPM	counts per minute
EQ-5D-Y	European Quality of Life-5 Dimensions Youth survey
ICC	intraclass correlation
ICER	incremental cost-effectiveness ratio
ID	identification
IMD	Index of Multiple Deprivation
IQR	interquartile range
LAG	Local Advisory Group
LEA	local education authority
MVPA	moderate- to vigorous-intensity physical activity
PA	physical activity
PE	physical education
QALY	quality-adjusted life-year
SD	standard deviation
SDT	self-determination theory
T0	time 0 (baseline)
T1	time 1 (end of intervention)
T2	time 2 (baseline plus 52 weeks)
TIDieR	Template for Intervention Description and Replication
VAS	visual analogue scale

Plain English summary

As children get older they tend to do less physical activity (PA). This is more the case for girls than for boys. It is important to increase PA in adolescent girls because participation in regular PA is linked to a lower risk of heart problems, diabetes and obesity in adulthood.

Girls find dance enjoyable, so providing dance classes could be a way to increase PA. In this study we used a randomised controlled trial to test this idea. A total of 571 Year 7 girls from 18 schools took part. Nine schools received up to 40 after-school dance sessions (two sessions per week for 20 weeks). We collected data from the girls three times to test whether or not the sessions affected their PA or attitudes towards being active.

When attending dance sessions, girls did increase their activity slightly, but this had no impact on their overall activity levels. Only one-third of those girls who signed up to the study regularly attended the sessions. However, the reasons given for not attending did not appear to relate to disliking the sessions. Many of the girls who attended told us that they enjoyed the dance sessions, that they developed a number of social and dance skills and that they made new friends. However, there was no measurable evidence for this. Although we provided the sessions for free, we estimate that it would cost £1.57 per girl to attend a session.

Scientific summary

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 BGDP 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.

Funding

Funding for this study was provided by the Public Health Research (PHR) programme of the National Institute for Health Research (NIHR). The work was also undertaken with the support of the Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement (DECIPHer), a UK Clinical Research Collaboration (UKCRC) PHR Centre of Excellence. Joint funding (MR/KO232331/1) from the British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, the Welsh Government and the Wellcome Trust, under the auspices of the UKCRC, is gratefully acknowledged. This study was designed and delivered in collaboration with the Bristol Randomised Trials Collaboration, a UKCRC Registered Clinical Trials Unit in receipt of NIHR Clinical Trials Unit support funding. All intervention costs were funded by the respective councils to which the participant schools were affiliated, namely North Somerset Council, Bristol City Council, and Bath and North East Somerset Council.

Chapter 1 Introduction/background

Benefits of physical activity

Regular physical activity (PA) can improve a number of risk factors for chronic disease, including body composition, lipoprotein profiles, insulin sensitivity, glucose levels and blood pressure in children and adults.[1,2] PA is also associated with positive emotional well-being and self-esteem among young people.[3] Despite these benefits, a large number of young people in the UK do not meet the PA recommendations of 60 minutes on most days of the week.[2] The number of young people meeting this guideline fell between 2008 and 2012.[4] There is an age-related decline in PA levels during childhood and adolescence, with the start of secondary school being a key period of downwards transition.[5,6]

Girls' physical activity

The percentage of girls who meet government recommendations of 60 minutes of PA per day is low.[4,7,8] Throughout childhood and adolescence, girls spend less time in moderate- to vigorous-intensity physical activity (MVPA) than boys, with reports of > 60% of girls' time being spent on sedentary behaviours.[7] Therefore, there is a need for effective strategies to attenuate this decline in PA among girls and to reduce the amount of time spent being sedentary.

A number of reasons have been proposed as possible explanations for the age-related decline in girls' PA. Research conducted by the Women's Sport and Fitness Foundation[9] found that girls' attitudes towards PA are positive and that 76% of 15-year-old girls want to do more PA. Girls perceived more barriers to being active than boys, ranging from disinterest and boredom to a lack of opportunity for the desired sport in school.[10] Self-presentation issues also affect participation, with 76% of girls agreeing that they are conscious of their body image.[9]

Sport competence has emerged as a common theme relating to the PA levels of girls. Sports competence declines with age in boys and girls, but is consistently lower for girls and falls faster between 17 and 18 years of age.[11] Physical education (PE) in school can expose anxieties and make girls feel embarrassed about their perceived lack of skill, further deterring them from participation. Focus groups based on girls' attitudes towards PA have reported that girls are often disinclined towards PA because they do not like to appear tired or 'sweaty' in front of peers, especially males.[10,12] Girls also worry about not looking 'cool' and being teased by boys and girls about not being feminine,[9,10] leading to an increased likelihood of giving up sport. During adolescence, girls begin to form their own self-perception of sporting ability, which contributes to the decision-making process about whether or not to participate.[11] Therefore, the factors that contribute to the decline in PA must be handled delicately and be considered when designing interventions to increase girls' PA.

Interventions to increase girls' physical activity

A recent meta-analysis concluded that interventions designed to increase girls' PA levels have a minimal, yet significant, effect ($g = 0.314$; $p < 0.001$).[13] On average, girls in intervention groups accrued 12.17% more PA than girls in control groups. The authors suggested that the results led to the belief that behaviour change in this population is challenging but possible. A subgroup analysis found that interventions developed specifically for girls and interventions with multiple components were more likely to produce a significant treatment effect. For example, an intervention that worked with Girl Scout troops to foster healthy behaviour resulted in girls in intervention troops accumulating significantly more MVPA

than girls in control troops, with 7.4% of girls meeting MVPA daily targets versus 1.6%, respectively ($\chi^2 = 18.4$; $p < 0.001$).[14]

A number of approaches have attempted to help girls overcome their anxieties around PA. Intervention approaches have included allowing schools to develop bespoke action plans to prevent the decline in girls' MVPA.[7] The Nutrition and Enjoyable Activity for Teen Girls intervention[15] provided enhanced school sports sessions for 12- to 14-year-old girls, held seminars and workshops, and used various tools to help self-monitor activity. The choice of music and appealing activities during the sports sessions were incorporated to engage girls. The results suggest that these elements may have contributed to the favourability of sessions (41.7% of participants reporting it as the most enjoyable component of the intervention). However, it was found that MVPA did not significantly differ between the intervention and control groups [adjusted difference in change –4.28 minutes/day, 95% confidence interval (CI) –13.82 to 5.25 minutes/day; $p > 0.05$].[15] It is important to note that the authors did not reflect on elements of the intervention that were successful or unsuccessful.

Taymoori and Lubans[16] used theoretical constructs to aid the development of educational and counselling sessions for girls in order to identify potential mediators of PA behaviour change. Both interventions showed an intervention effect on self-reported PA. However, PA was not measured objectively. The authors concluded that certain behavioural strategies, such as goal setting and activity monitoring, were mediators for behaviour change. This suggests that interventions that focus on these components could be effective in increasing PA. Few studies have focused on increasing girls' PA as well as on attempting to overcome barriers such as low levels of competence and providing choice. Therefore, there is need for an intervention to be tailored to address these issues.

In summary, research suggests that adolescent girls are less active and experience greater declines in PA than boys because they have disengaged from and/or lack confidence in the types of PA that are traditionally offered. Increasing girls' perceived competence, strength of identity and interest in activities may help to sustain girls' participation in PA throughout adolescence.

Dance as a method to improve girls' physical activity levels

Dance is popular among UK and US adolescent girls.[12,17,18] Dance also provides an opportunity to socialise.[19] The proportion of girls who dance remains high throughout adolescence, with 31.9% engaging at 12–13 years of age and 33.1% at 18 to 19 years of age.[20] This interest in dance indicates that it could be a useful medium through which to help improve girls' participation in PA.

In order to promote dance as a medium for increasing girls' PA, it is important to understand what attracts girls to dance. It appears that the style of dance is important. In particular, modern, high-energy dances are seen as more fun.[19] Girls particularly enjoy the opportunity to input into the dance moves that they learn and perform.[19] The type of music (contemporary and upbeat) is a key factor that appeals to girls.[19] Opportunities to socialise and support from peers contribute to whether or not girls participate.[19,21] Dance provides an opportunity for all of the above and can be used as a tool to help overcome barriers to girls' participation in PA. Dance is usually group-based (and is thus less likely to lead to individuals being on public display), non-competitive and takes place indoors where weather is not particularly important.[10,12,22]

Dance interventions

Numerous studies have examined the effects of dance interventions on physical and psychological factors in females. A dance intervention focusing on the 'joy of movement' successfully improved self-rated health scores among girls (aged 13–18 years) with internalising problems at 8-, 12- and 20-month follow-up (8-month difference in mean change 0.30, 95% CI –0.01 to 0.61; 12-month difference in mean change 0.62, 95% CI 0.25 to 0.99; 20-month difference in mean change 0.40, 95% CI 0.04 to 0.77).[23] Aerobic capacity ($p = 0.001$) and upper body strength ($p = 0.002$) has also been found to significantly increase for

girls attending contemporary dance classes.[24] These studies were limited by the absence of a control group, the small sample size and the fact that, although recruitment took place within a school setting, two of the interventions were carried out in the community.

The 'Dance 4 your life' intervention improved self-esteem ($p = 0.01$) from pre to post intervention among females aged 14 years.[24] Burgess *et al.*[25] found improvements in factors that contribute to self-esteem, which supports the findings from 'Dance 4 your life'. A total of 6 weeks of aerobic dance classes reduced body image dissatisfaction and enhanced physical self-perception. However, girls were recruited selectively based on their scores for these variables.[25] Zander *et al.*[26] found that participants in a dance intervention were likely to form mutual affective and collaborative ties with peers, indicating that dance can be used as a socialising medium. Limitations to this trial include the lack of evaluation of the project and the non-random assignment to control or intervention arms. These studies provide evidence for many health-related benefits of dance; however, few studies have focused on the effect of dance on PA levels. There is a need, therefore, to test the applicability of a large, robust, UK dance-based intervention to increase PA levels among girls.

Dance has been established as a valid alternative to traditional sport and exercise, as it has been proven to elicit physical and psychological health benefits. It has also been found to contribute up to 29% (95% CI 25.9% to 31.6%) of girls' total MVPA and to reduce the amount of time that girls spent on sedentary behaviour ($p < 0.001$).[27] Moreover, girls enrolled in dance classes accumulated more MVPA on days on which they danced (28.7 ± 1.4 minutes) than on non-dance days (16.4 ± 1.5 minutes) ($p < 0.001$). However, the cross-sectional design of this study limits the ability to attribute increasing MVPA solely to dance.

Girls who may drop out of other activities during secondary school are more likely to engage in dance.[28] Dance has the potential to increase the intrinsic motivation for PA and to improve perceived autonomy, competence and relatedness.[21,28] Recent media coverage that demonstrates the benefits of dance has increased its popularity with the public and heightened awareness of dance as a form of exercise.[24] Therefore, dance interventions may be more appealing to girls and may function as an effective means by which to increase girls' MVPA.

There is little current dance provision within UK schools. Over 50% of primary schools in the UK do not provide dance as an extracurricular activity[29] (equivalent data are not available for secondary schools). In secondary schools in England, there is no requirement for the arts to be taken as part of the English Baccalaureate, meaning that access to the arts (including dance) in schools is limited. In addition, only 4% of PE teachers hold a post-Advanced-level qualification in dance,[30] restricting the quality of dance offered as part of PE.

After-school interventions

The extended schools policy,[31] in which all UK secondary schools are encouraged to stay open for additional activities, provides an opportunity to alleviate some of the problems associated with dance provision in schools. A benefit of interventions being held after school is that they take place in a safe environment in which children can be active and spend time with peers and adults, who may act as role models.[32] The majority of after-school programmes have been well received by parents and children, meaning that the hours after school provide a good opportunity for children to have fun and be active.[32,33] Atkin *et al.*[34] found that the most effective after-school interventions were located on school sites, where they are easily accessible, and this eliminated some of the reliance on transport and parents/carers. The authors suggested that after-hours interventions may be more successful if the focus is on changing only one behaviour and if the intervention is relatively short in duration (two effective and four non-effective studies were < 12 weeks), as many longer interventions faced implementation and fidelity issues.

Organised after-school PA programmes that focus on increasing PA opportunities for a wide group of adolescents could be an effective means by which to engage inactive adolescents in PA.[35] Previous systematic reviews report that the evidence for interventions to increase PA in young people is weak. This is, in part, a result of poor design, weak methodology and insufficient statistical power. There is a need for additional well-controlled studies that incorporate a theoretical rationale to produce trustworthy results.[32–34,36,37] A recent literature search revealed that since these reviews, there have been five randomised controlled trials[38–42] that employed objective measures of PA in evaluating the effectiveness of a school-based intervention to increase PA levels. Of these, two were feasibility trials[38,39] and one was a cross-sectional study.[40]

Looking at the five studies, withdrawal and drop-out rates were low (< 20%); however, attendance varied widely, thus compromising intervention integrity. Two studies[38,39] reported on the long-term impact of the intervention on PA once the programme had finished. Only one study[41] monitored intervention consistency, making it difficult to establish whether or not the other interventions were delivered as intended. The use of psychological theory was found to contribute to the success of behaviour-change theories.[43] All but one[42] of the five studies used either social cognitive theory or self-determination theory (SDT) to aid the development of their interventions, thereby allowing the appropriate mediators of PA to be targeted.

The five studies suggest that there is some evidence that school-based interventions were successful in increasing objectively assessed MVPA among certain subsets. Our own feasibility work [Bristol Girls Dance Project (BGDP) feasibility trial], in which girls in intervention schools received a 9-week programme consisting of two 90-minute dance sessions per week increased MVPA among intervention participants at 3 months after the completion of the dance sessions (8.7 minutes per weekday, 95% CI 5.5 minutes per weekday to 11.9 minutes per weekday) compared with a control group.[38] The Action 3 : 30 trial trained teaching assistants to deliver after-school PA sessions to 9- to 11-year-old children; weekday MVPA for boys increased by 8.6 minutes per day (95% CI 2.8 minutes to 14.5 minutes).[39] Both Madsen *et al.*[42] and Dzewaltowski *et al.*[40] found a significant increase in MVPA in an overweight subsample of children. The SCORES programme used soccer to support the development of skills and competencies among 9- and 10-year-old students and resulted in an increase in MVPA of 3.4 minutes per weekday (95% CI 0.3 minutes per weekday to 6.5 minutes per weekday; *p*-value not reported) among students with a body mass index (BMI) at or above the 85th percentile.[42] The HOP'N trial aimed to develop the skills and efficacy of adults and children (aged 9–10 years) to build a healthy after-school environment. Overweight/obese children in the HOP'N trial obtained 5.92 minutes more MVPA per day (95% CI –13.00 minutes to 1.17 minutes; $p = 0.10$) than overweight children in the control group.[40] Finally, Wilson *et al.*[41] conducted the Active by Choice Today trial among adolescents from low-income and ethnic minority backgrounds, which consisted of a 17-week programme delivered three times a week for 2 hours. The programme entailed a homework and snack element, MVPA activities chosen by students and a behavioural skills/motivational component. MVPA declined less among students in the Active by Choice Today trial intervention group than in the control, resulting in 4.87 minutes (95% CI 1.18 minutes to 8.57 minutes) more MVPA per day than those in the control group.[41]

It is important to recognise that, although these five studies indicate that after-school programmes hold promise for increasing children's PA levels, they have limitations. The Active by Choice Today trial found that fidelity and dose were not adequate during the first year of the trial, potentially weakening the overall effect.[41] The other studies did not monitor fidelity[38–40,42] and at least one[39] emphasised this as a limitation. The need for new strategies to keep attendance levels high to improve intervention integrity also emerged from the studies.

Theories of behaviour change: self-determination theory in physical activity research

Interventions based on psychological theory have proved more successful than those not based on psychological theories.[43,44] SDT[45] is particularly illuminating in examining adolescents' motivation for PA[46] (e.g. how self-determined their reasons for PA are). The underlying principles of SDT are that self-determined (autonomous) motivation is behaviourally and psychologically adaptive and that it develops to the extent that individuals perceive a sense of ownership or autonomy over their PA, feel able and competent and are supported in their PA by meaningful social relationships.[45,47] This hypothesis is supported by empirical research in the PA/exercise domain among children,[48] adolescents[49] and dancers.[50]

Six motivation types are proposed in SDT, varying in their degree of self-determination or autonomy. Each is hypothesised to be differently associated with individuals' engagement in a given behaviour (e.g. being active), cognitive processes and affective outcomes.[51] The more self-determined motivational types (intrinsic, integrated and identified behaviours) are grouped as autonomous. Intrinsic motivation sees an individual engage in an activity for inherent satisfaction or enjoyment. Other forms of motivation involve doing the behaviour for a reason(s) distinctive from inherent satisfaction. Integrated regulation is when engaging in a behaviour is in line with an individual's broader self (e.g. being active as part of a person's identity). Identified motivation is driven by an outcome, such as health benefits or friendship. The less self-determined motivational forms (introjected and external) are broadly grouped as controlled motivation. Introjected regulation refers to motivation based around internalised pressures, like avoiding feelings of guilt. External regulation is characterised by prods and pushes that are external to the individual, such as avoiding punishment.

Previous research suggests that autonomous motivation for PA is positively associated with an increase in young people's PA behaviour.[48,52] In addition, autonomous motivation is seen to positively affect psychological outcomes such as quality of life and physical self-concept.[53] Girls with autonomous motivation for exercise have been found to exhibit a greater sense of competence and achievement, and tend to remain involved in PA, whereas those without this form of motivation lose interest and look elsewhere for investment of their efforts.[54] Evidence suggests that social aspects motivate girls to engage in PA, with > 50% of girls being active because of peers.[9] Peer support is an important factor in the participation and retention of after-school dance programmes.[19] It has been shown that children cluster in groups with similar activity levels,[55] suggesting that friendship is important for PA participation. As such, an intervention that addresses these factors may be successful in engaging girls in PA and encouraging lifelong attitudes towards being active.

Self-determination theory is particularly amenable to inclusion in behavioural interventions because it specifies the psychological and socioenvironmental conditions that underpin autonomous forms of motivation.[56] In SDT, it is important to note that for interventions delivered by practitioners (e.g. dance instructors), people's psychological needs can be supported or undermined by the motivational climate that an authority figure creates through their interpersonal or teaching style.[57,58] Needs-supportive motivating styles are underpinned by the provision of autonomy support (i.e. providing a meaningful rationale, offering choice and avoiding the use of controlling language), structure (i.e. setting out clear expectations and providing guidance) and involvement (i.e. being empathic and showing genuine interest for others).[58,59] A controlling motivating style is characterised by strategies such as tangible rewards, feedback aimed to manipulate rather than to inform and the use of controlling language.[60] Among children, PE teachers' use of autonomy-supportive versus controlling motivation styles has been associated with pupils' psychological need satisfaction and autonomous motivation for PE.[49]

Formative work

Extensive formative work was conducted to inform the design of the current study. This included: (1) qualitative work with Year 7 girls and their parents on how to design an after-school dance programme and recruit children;[19] (2) interviews with teachers and dance specialists to identify key elements to incorporate into the intervention;[61] and (3) a feasibility trial[38] and economic evaluation.[62]

Focus groups (including 65 girls) and telephone interviews (with 16 parents) were conducted in four secondary schools across Bristol.[19] Some issues were suggested to affect recruitment. The intervention needed to be marketed as fun and enjoyable (as well as something that provides an opportunity to socialise). To encourage participation, taster sessions were considered useful. Parents suggested that attracting groups of friends and stressing the health benefits of dance may also increase interest. Views on sustaining participation differed for girls and parents. Girls highlighted the importance of dance styles and music (and being allowed to input on both) for keeping them motivated, and parents suggested that setting achievable goals throughout the programme would help retention. Parents also cited enjoyment and teaching style as important.

Interviews were conducted with 11 PE teachers from secondary schools in the local area and 11 dance instructors.[61] PE teacher interviews covered logistical issues of a dance intervention within a school setting and structure, content and recruitment concerns for an after-school dance programme. Dance instructor interviews explored barriers to participation, strategies to aid progression, content of dance sessions and how to retain participants. PE teachers pointed to a lack of dance in school and suggested that they were not confident to deliver dance. All dance instructors concurred that dance sessions should cover a number of dance genres and be structured in a way that helps foster friendships, enjoyment, ownership and a rapport between instructor and pupils.

The BGDP feasibility study[63] was a three-arm, parallel-group, cluster randomised controlled study and economic evaluation, with schools as the unit of allocation. The intervention content was informed by the focus groups and interviews discussed above. Seven secondary schools were recruited and all Year 7 girls who were physically able to participate in PE were invited to participate. For practical reasons the sample was limited to 30 girls per school. Three intervention schools received two 90-minute after-school dance classes per week, for 9 weeks. The feasibility trial demonstrated that it is possible to recruit Year 7 girls and record the cost of the programme. The study also showed that girls would attend dance sessions and that it was feasible to collect PA data from the girls at three time points. The feasibility work suggested that it is possible to achieve a mean increase of 10 minutes of MVPA per weekday if the session intensity was increased and inactive creative time reduced. An embryonic resource use checklist was developed for use in the main trial economic evaluation.[62]

Summary and rationale for the Bristol Girls Dance Project trial

Physical activity is important for the prevention of a number of diseases and also enhances mental well-being. PA declines during youth, with the start of secondary school being a crucial period of change. Girls are less active than boys at all ages and there is an absence of effective interventions to encourage PA in girls. Dance provides an opportunity for high levels of PA; it is also social and enjoyed by girls. As such, dance has the potential to function as a source of PA across the life-course. After-school dance programmes may be an effective means by which to increase the PA levels of girls. However, dance provision in schools is limited, and in the current economic climate schools have reduced funds to support after-school programmes. The goal of this study was to test whether or not after-school dance programmes can be effectively delivered in UK secondary schools.

Chapter 2 Trial design and methods

Aims and objectives

The specific research aims of the BGDP (locally known as Active7) trial were as follows.

Primary aim

1. To determine the effectiveness of the BGDP intervention to improve the objectively assessed (accelerometer) mean weekday minutes of MVPA accumulated by Year 7 girls 1 year after the baseline measurement (T2 = T0 + 52 weeks).

Secondary aims

2. To determine the effectiveness of the BGDP intervention to improve the following secondary outcomes among Year 7 girls at T2:

    - mean weekend day minutes of MVPA
    - mean weekday accelerometer counts per minute (CPM) (providing an objective measure of the volume of overall PA in which girls engage)
    - mean weekend accelerometer CPM
    - the proportion of girls meeting the recommendation of 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
    - programme costs (school-level).

3. To determine the effectiveness of the BGDP intervention during the intervention period (T1) on all primary and secondary outcome variables.
4. To determine the extent to which any effect on the primary outcome was mediated by autonomous and controlled motivation towards PA and perceptions of autonomy, competence and relatedness in PA.[45]
5. To determine the cost-effectiveness/utility of the intervention from a public-sector perspective over the time frame of the study.

Research design

The trial was a two-armed, cluster randomised controlled trial conducted in 18 secondary schools across the greater Bristol area. The trial included process, economic, quantitative and qualitative evaluations.

The study was granted ethical approval from the School for Policy Studies, University of Bristol, and was sponsored by the University of Bristol. The trial was registered with International Standard Randomised Controlled Trial Register under the reference number ISRCTN 52882523. The original study protocol was sent to the National Institute for Health Research (NIHR) on 26 April 2013 and published as a journal article.[64] A small number of revisions were made to the protocol during the study. A summary of changes that were made to the original protocol paper are given in *Table 1*.

TABLE 1 Revisions to protocol

Change to protocol	Date
The recruitment target was increased from 30 to 33 girls in each school	17 July 2013
Girls in intervention schools were be given a 'dance diary'. They were encouraged to complete this between sessions. Diaries required girls to reflect on their learning and set personal goals	20 September 2013
The questionnaires that girls answered include a section that measures self-esteem	
The process evaluation incorporates audio-recording of dance instructors. Observers rated the degree to which the instructors delivered the core components of the session. The audio-recordings were rated, using a validated tool, to measure the extent to which dance teachers' teaching styles were autonomy-supportive	
A recommendation from the March Trial Steering Committee meeting was to reconsider the inclusion criteria for the secondary analyses. The protocol was subsequently amended to reflect these changes: (a) The wording of the inclusion criteria for the primary outcome was edited to be more specific: 'Participants will be included in the analysis of mean weekday minutes of MVPA if they provide at least 2 days of valid weekday data. A valid day will be defined as at least 500 minutes of data between 5am and 11.59pm' (b) The wording of the secondary outcome was edited to be more specific: 'The following accelerometer-derived variables will be considered secondary outcomes: a) mean weekday minutes of MVPA (T1) b) mean weekend day minutes of MVPA (T1 and T2)' (c) Inclusion criteria for secondary outcome was changed to be more specific: 'To be included in weekday analyses participants must provide at least 2 valid weekdays of data. For weekend day analyses girls need to provide at least 1 valid day of weekend data. To assess the proportion of girls meeting PA guidelines, participants will need to provide at least 2 valid weekdays and 1 valid weekend day of data'	1 May 2014

Study population and recruitment

The study sought to recruit 18 mainstream secondary schools (excluding special educational needs providers, dance academies and privately/independently funded schools) operating within three local authorities (Bristol City Council, North Somerset Council and Bath and North East Somerset Council). To participate, schools needed to have at least 30 Year 7 girls and be able and willing to allocate space for two after-school sessions per week for 20 weeks between January and June/July 2014. All schools fulfilling the inclusion criteria were invited to participate and the first 18 schools that agreed to participate were enrolled. Additional schools were placed in a reserve pool. We aimed to recruit between 25 and 33 Year 7 girls from each school (450–594 girls). To participate schools had to recruit at least 25 girls to the study. In the case of five schools, it was not possible to recruit the minimum number of girls, so reserve schools acted as replacements. This extended the recruitment period into November 2013.

Following school recruitment, a participant recruitment campaign was initiated in all 18 schools. A taster session was provided for all Year 7 girls who were able to engage in PE classes. Taster sessions were delivered by external dance instructors within school time (usually in a PE session). At the end of the taster session pupils were told about the study (including details of the randomisation and data collection commitments). The only exclusion criterion applied at pupil recruitment was that girls were able to participate in standard PE lessons.

Where more than 33 consent forms were returned, pupils were randomly ranked, with the first 33 pupils being selected at random using a computer-generated algorithm. Any girl dropping out of the study prior to baseline data collection was replaced by the subsequent pupil in rank order. This process was repeated as necessary. No replacements were made after baseline data collection.

School contacts signed a 'school study agreement', which stated that the school contact was happy for their school to take part in the study and for data to be anonymously stored in data sets and be used for publication. The form also collected contact details and basic demographic information of Year 7 girls. Written informed parental consent was obtained for all girls, and school contacts and dance instructors (taking part in the end of study qualitative work) also provided written informed consent. Following each taster session, all girls were given information packs for themselves and their parents/guardians. Girls wishing to participate had to return a completed parental informed consent form to school.

Our pilot work[63] indicated that small reimbursements enhance data provision. As such, all girls received a £10 gift voucher on completion of each data collection phase (£30 in total). Control schools were each given a £500 donation to offset any costs incurred in facilitating data provision, which was received after the third stage of data collection.

Public and patient involvement

A Local Advisory Group (LAG) was formed to improve the relevance and delivery of the intervention for the schools and girls taking part. The LAG consisted of a variety of individuals in order to address the views of as many stakeholders as possible. The group met on three occasions during the study and played an important part in informing the intervention materials (dance diaries), behaviour management and attendance. The LAG also provided extensive input into the dissemination materials, which were developed in consultation with them. The group consisted of local council staff, school teaching staff, dance instructors, creative directors, school sport development managers and parents.

Baseline data

Both objective and self-reported data were collected from various stakeholders. A summary of the data collected can be found in *Box 1*.

BOX 1 Description of data collected at baseline

Data collected at baseline

School level

The local authority to which each school belonged.

Percentage deprivation (based on the Department of Education's Pupil Premium, a measure of the number of girls receiving free school meals in each school).

Total number of pupils in school.

Total number of Year 7 girls in school.

Baseline mean MVPA per school (for randomisation purposes).

Details on after school activity provision available to Year 7 girls in school.

Participant level

Parent reported

Home postcode.

Age of child (years and months).

Number of siblings.

Highest level of education in household.

Child reported

Objectively assessed:

- Accelerometer data for 7 days (see *Table 4* for PA measures derived from accelerometer data).
- Height (cm) and weight (kg) to calculate standardised BMI z-score (kg/m^2).

Self-reported:

- EQ-5D-Y score.
- Psychosocial questionnaire (tablet device).
- Dance classes attended outside school (child questionnaire).

Randomisation

Schools were randomised to control ($n = 9$) or intervention ($n = 9$) in a 1 : 1 ratio after baseline data had been collected using Stata version 12.1 (StataCorp LP, College Station, TX, USA) code specifically designed to balance the two arms by minimisation, which took account of four school-level factors, namely local authority, school size, baseline mean MVPA (%) and deprivation (based on the percentage of children with free school meals). Deprivation was assessed as the percentage of pupils in the school eligible for the Department of Education's Pupil Premium (additional funding given to schools to support disadvantaged pupils and bridge the attainment gap between them and their peers). Randomisation was conducted by Keeley Tomkinson. Mark J Edwards made schools aware of their allocation soon after randomisation was conducted.

Intervention group

The nine schools that were randomised to the intervention arm received a 20-week dance intervention, consisting of two 75-minute after-school sessions per week (maximum 40 sessions), which were provided between January and June/July 2014. Dance sessions were led by 10 professional self-employed dance instructors who delivered a standardised programme which was developed in the feasibility trial. Instructors attended an induction session before the intervention began (December 2013) and a 'booster session' after the first term of intervention delivery (April 2014).

The dance programme focused on building girls' autonomous motivation to be active and perceived dance autonomy, competence and relatedness through an autonomy-supportive environment. The programme provided exposure to a wide range of dance styles (instructors were given flexibility in what they delivered) (see *Appendix 1*). Girls in intervention schools were each given a 'dance diary' (see *Appendix 2*) which they were encouraged to complete between sessions. The diaries were intended to help children reflect on their learning and to encourage them to set their own goals.

Development of dance instructor training and manual

The BGDP aimed to increase girls' autonomous (mainly identified and intrinsic) motivation for both dance and PA more broadly by providing them with fun and need-satisfying dance sessions led by an autonomy-supportive instructor. This was targeted through the 'Guide for dance instructors' ('session-plan manual') (see *Appendix 1* for excerpts), the session design and content, and dance instructor intervention training. The ways in which the dance instructor manual and session content mapped on to the theoretical targets of the intervention are presented in *Table 2*. Dance instructors received a 1-day training session prior to the start of the intervention. The training was developed collaboratively between a dance instructor who had been involved in the feasibility study and study team. From the theoretical perspective it included a 2-hour session on SDT that highlighted the key features of the training manual (i.e. definitions and descriptions of motivation types, need-satisfaction and autonomy-supportive motivating styles) and how it can be applied in after-school dance sessions. Practical activities were used throughout the training to provide dance instructors with the opportunity to practice autonomy-supportive styles, ask questions and receive feedback. At the mid-point of the intervention, dance instructors attended a half-day booster session where the central tenets of the SDT-based teaching style were revisited and instructors were able to share their experiences of delivering the intervention and collaborate with study staff to resolve any problems they were facing.

TABLE 2 Mapping the 'Guide for dance instructors' and dance session content to SDT-based intervention targets

Theoretical target	Guide for dance instructors/'motivation toolkit'	Dance session design and content
AS	• Definition and description of autonomy need • Definition and description of autonomy-supportive vs. controlling style • Example AS teaching strategies, vignettes • Separation from a laissez-faire style • Using autonomy-supportive vs. controlling language (description and examples) • Using rewards wisely (unexpected verbal praise) • Instructor learning tasks including case studies and self-reflections	• Provision of choice on music and dance styles • Developing own dances and sections of dances • Using variety of role models (e.g. leading warm up) • Provide girls the option of whether or not to build up to a dance performance and the nature of any performance
CS	• Definition and description of competence need • Example CS teaching strategies, vignettes • Supporting competence verbally and through the setting/nature of tasks • Instructor learning tasks including case studies and self-reflections	• Begin with a familiar dance (i.e. the dance from the 'taster session') • Differentiation of activities to varied skill levels • Progression from simple to more complex skills and routines • Dance diaries completed at end of sessions to encourage self-reflection • Allow girls to dictate rate of progression/ when to move on
RS	• Definition and description of relatedness need • Example RS teaching strategies, vignettes • Definition and description of involvement including example strategies • Instructor learning tasks including case studies and self-reflections	• Dance instructor asking about girls' lives outside of Active7 (e.g. weekends, holidays) • Focus on teamwork, group dances and building group ethos
Structure	• Definition and description of structure • Separation from laissez-faire style • Discipline and staying safe (using rationales) • Developing behavioural guidelines/instructor and pupil expectations • Dealing with poor behaviour (stepped approach)	• Involve girls in setting rules within first 2 weeks • Remind girls of rules and provide rationales • Implement stepped procedure to deal with poor behaviour
Promoting autonomous motivation	• Definition and description of motivation types and the 'Active7 Zone' (intrinsic and identified) • 'What is wrong with controlled motivation' – definitions and description	• Focus sessions on having fun and maintaining energetic teaching. • Avoid/minimise use of external controls (e.g. punishments) or rewards or internalised pressure (e.g. guilt trips)

AS, autonomy support; CS, competence support; RS, relatedness support.

Template for Intervention Description and Replication checklist

In an attempt to standardise the reporting of interventions, the Template for Intervention Description and Replication (TIDieR) checklist and guide has been proposed.[65] The 12-item checklist aims to improve the reporting and replicability of interventions. *Table 3* summarises the BGDP trial in accordance with the TIDieR checklist.

TABLE 3 The Bristol Girls Dance Project intervention details: TIDieR checklist

Item	Description
Name (1)	BGDP (locally known as 'Active7')
Why (2)	The primary aim was to assess the effectiveness and cost-effectiveness of an after-school dance intervention in increasing mean weekday minutes of MVPA among 11- to 12-year-old (Year 7) girls. The proportion of adolescent girls who meet the recommended levels of MVPA per day is lower than for boys. PA levels among children decline as they progress through to adolescence Girls lose interest in PE, face barriers to being active and lack opportunities for other desired PA. Competence in PA declines throughout school and self-presentational concern can deter girls from PA. Dance is a desirable activity for girls and can contribute to MVPA. It provides opportunities for peer support and socialisation and is perceived as enjoyable The Active7 intervention is based on SDT, which suggests that satisfying individuals' sense of freedom and choice, and helping them feel competent in PA and supported by others, will help nurture more self-determined forms of motivation to be physically active Research and current PA trends suggest that there is a need for effective strategies to attenuate the decline in girls' PA levels. A dance intervention has the potential to be a cost-effective way of engaging girls in PA
What: materials (3)	Training was provided for dance instructors who delivered the intervention. The content focused on the philosophy of the BGDP and how to deliver dance sessions underpinned by SDT. Specifically, the session covered different motivation and communication styles, how to create an autonomy-supportive environment, how to build a sense of belongingness among the group and how to increase competence. A booster training session (mid-way through the intervention) included a refresher on motivating children and managing problem behaviour, as well as covering the remaining session plans All instructors were provided with a 'Guide for dance instructors', detailing the aims and objectives of the study and how to deliver sessions successfully. It also included 40 session plans. A gradual progression was incorporated into the intervention design All intervention school girls received a dance diary. This was a booklet in which girls could reflect on their progression and the dance sessions (encouraging girls to reflect on what they had learnt and enjoyed, what they would like to do in future sessions and goals they wanted to achieve)

continued

TABLE 3 The Bristol Girls Dance Project intervention details: TIDieR checklist (*continued*)

Item	Description
What: procedures (4)	Secondary schools were recruited through a letter of invitation. A meeting was held between the school contact and BGDP trial manager to discuss logistical issues and to obtain a signed study agreement form. A taster session was then delivered to all Year 7 girls who were able to take part in PE. The taster sessions most often took place instead of PE lessons and were led by one of the study's trained dance instructors. Students were told about the study and given information packs for themselves and their parents. Children had to return signed consent forms a few days later in order to sign up to the study There were 33 intervention places available per school. If more than 33 girls provided consent, girls were randomly selected to participate. Reserves were used if a girl dropped out prior to baseline data collection Schools were randomly assigned to 'intervention' or 'control' groups and were made aware of their allocation shortly after baseline data collection (in order to allow sufficient time to organise the after-school sessions) Intervention schools received dance sessions led by an external dance instructor. The dance sessions were free to the school and girls A process evaluation was conducted throughout the study to assess the implementation and mechanisms of intervention impact. The process evaluation reported on the dose, implementation and theory fidelity, and intervention receipt. Attendance was recorded by the instructor. Observations occurred at four occasions within a randomly chosen session within each quarter of the intervention to assess theory fidelity and intervention receipt. Girls recorded their perceived levels of enjoyment and exertion on four occasions
Who provided (5)	Freelance female dance instructors from the local area were recruited to the study In total, 10 instructors delivered the intervention. One instructor delivered the intervention in two schools. Halfway through the intervention period one instructor withdrew and was replaced by a reserve. Instructors covered one another's absences. Instructors were paid for each session they delivered. All instructors completed a half-day training session, specific to the BGDP, before the intervention began. Instructors also attended a half-day 'booster session' after the first term of programme delivery
How (6)	Dance sessions were open to a maximum of 33 girls, who consented to participate at the beginning of the study
Where (7)	Dance sessions were delivered after school in the nine intervention schools. Schools were located across the greater Bristol area. The sessions were delivered in school facilities, usually a dance studio or school hall
When and how much (8)	Intervention schools received two 75-minute dance sessions per week (term-time only) for a period of 20 weeks (a total of 40 sessions), starting in January and finishing in June/July 2014. Sessions began 5–10 minutes after school (usually between 15.00 and 15.40)
Tailoring (9)	All instructors received the same training and materials to aid delivery. All were also encouraged to adopt an autonomy-supportive environment in line with SDT
Modifications (10)	No modifications were made to the intervention; however, after 4 months delivering the programme, one dance instructor was unable to continue. This instructor was replaced by a reserve instructor who had delivered some taster sessions
How well: planned (11)	Fidelity to the intervention manual was reported by dance instructors. Instructors indicated the extent to which the session was similar to the main features from the manual as either 'very', 'somewhat' or 'not at all'
How well: actual (12)	In total, 93 (26.80%) sessions were reported as being 'very' similar to the manual, 164 (47.26%) were 'somewhat' similar and 90 (25.94%) were 'not at all' similar [one session had missing data (0.29%)]. Instructor interviews revealed that adherence to the manual was initially high but reduced over time in response to the needs and skill levels of the girls. No instructor fully adhered to the manual. On the whole, instructors reported adhering to the principles of SDT during the delivery of sessions by offering need-support; this aligned with the girls views, although there was room for improvement in theoretical fidelity

Control group

Schools in the control arm did not receive the dance intervention and continued with their normal practice (no data were collected regarding what was offered during the intervention period in control schools). Control schools received a £500 donation to the school fund after all data had been collected from girls.

Measurements

Data were collected from all girls (intervention and control) at three time points:

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

To assess any contamination of the control group from dance classes locally, we collected data on the extracurricular provision (including dance) offered by all 18 schools. This was done at each measurement point. In addition, girls were asked if they attended dance classes outside school at each measurement point. At baseline, parents completed a demographic questionnaire which included the free-text item 'Does your Active7 child take part in any other after-school clubs?'. To assess differences between the intervention and control girls at T1 and T2, and to minimise any burden on parents beyond baseline, girls were asked to complete one questionnaire item at T1 and T2 measuring the types of activities (active and sedentary) that they had performed in the after-school period, in the evenings and at the weekend over the past 7 days. This item was intended to help understand the PA behaviour of the girls in both groups at all time points. All data were collected during school time on school premises.

Accelerometer-determined physical activity

Girls were asked to wear an Actigraph GT3x+ (Actigraph LLC, Pensacola, FL, USA) accelerometer for 7 days. Periods of ≥ 60 minutes of zero values were defined as accelerometer 'non-wear' time and excluded from analysis. Girls were included in the primary outcome analysis if they provided 500 minutes of valid data on at least 2 weekdays. Mean minutes of daily MVPA were defined as ≥ 2296 CPM, which was established using the threshold developed by Evenson *et al.*[66] This has been shown to be an accurate threshold for this age group.[67] The derived accelerometer measures are listed in *Table 4*.

TABLE 4 Accelerometer variables derived for the BGDP

Variable	Period of time (average minutes)	Time point	Reason assessed: to determine the effectiveness of the BGDP to improve the following variables
MVPA	Weekday	T0, T1, T2	Mean weekday minutes of MVPA per day
	Weekend day		Mean weekend minutes of MVPA per day
	Overall		The proportion of girls meeting the recommendation of 60 minutes of MVPA per day
Counts	Weekday	T0, T1, T2	The volume of activity in which girls engage in on weekdays
	Weekend day		The volume of activity in which girls engage in on weekend days
Sedentary time	Weekday	T0, T1, T2	Mean weekday minutes of sedentary time per day

Psychosocial questionnaire

At each time point girls were asked to complete a psychosocial questionnaire. Questionnaires were completed on a Google Nexus 7 (ASUSTek Computer Inc., Taipei, Taiwan) tablet. We hypothesised that the variables below would mediate the effect of the intervention on girls (*Figure 1*). The psychosocial questionnaire was therefore designed to provide all the information that would be needed to address this question, specifically the following constructs were assessed:

- motivation for dance and PA
- perceived autonomy, competence and relatedness in PA.

All girls were asked to complete a 67-item questionnaire at T0. The questionnaire assessed psychosocial variables that could be influenced by the intervention and/or mediate the effect of the intervention on MVPA. Questionnaires assessed autonomous and controlled motivation for dance and PA,[68] perceptions of autonomy, competence and relatedness[69,70] within PA and self-esteem.[71]

A modified questionnaire was used at T1 and T2. The girls were asked about the after-school activities in which they took part and whether or not they took part in organised dance outside school. At T1 only (during the intervention), girls rated the degree to which they perceived their dance instructor to be autonomy-supportive on a seven-point scale (strongly disagree to strongly agree). Items were based on the Health Care Climate Questionnaire[72] and have been adapted for use in an activity setting.[73] At T2 these six questions were removed from questionnaires, as they were relevant only at T1 when girls were taking part in the intervention. A summary of the variables that were assessed at each time point can be found in *Table 5*.

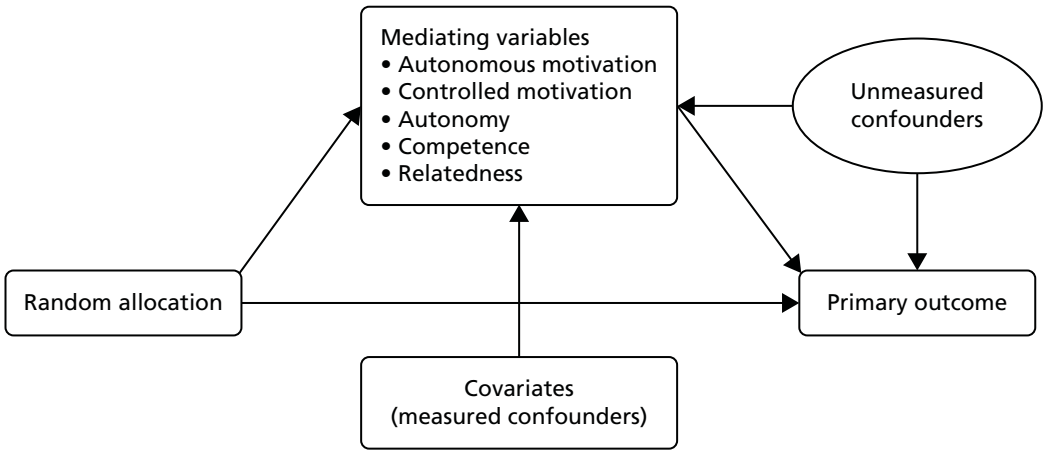

FIGURE 1 Hypothesised mediation model.

TABLE 5 Psychological questionnaire items

Items assessed	T0 (baseline, September to November 2013)	T1 (weeks 17–20 of the intervention, July 2014)	T2 (follow-up, September to November 2014)
SDT-derived questions (67 items)	✓	✓	✓
Weekday and weekend day activity questions (8 items)		✓	
Sport climate questionnaire (6 items)		✓	

Height and weight

Girls' height and weight were measured at each time point. Girls were asked to remove footwear and any bulky clothing they had on before being measured. Height was measured to the nearest 0.1 cm using a Seca Leicester stadiometer (HAB International, Northampton, UK). Weight was measured to the nearest 0.1 kg using a Seca 899 digital scale (HAB International, Northampton, UK). Data were recorded on paper by two study team members and cross-checked when being entered into study databases. BMI (kg/m^2) was then calculated and converted to an age- and sex-specific standard deviation (SD) score.[74]

European Quality of Life-5 Dimensions Youth survey

All girls completed a paper-based EuroQol EQ-5D-Y scores at each time point. The EQ-5D-Y, recently validated for use in adolescents,[75] was applied as a secondary outcome measure of health-related quality of life.

Sample size

Sample size calculations were performed to detect a mean difference of 10 minutes of weekday MVPA between the intervention and control groups. The uninflated sample size required for analysis to detect a difference of 10 minutes/day MVPA, assuming a SD of 18 minutes[63] with 90% power and a 5% two-sided alpha of 68 per arm. We estimated the 95% CI for the school-associated intraclass correlation (ICC) in the pilot study to be < 0.001 to 0.087. On the assumption that 20% of girls would not provide primary outcome data, the mean cluster size for analysis would be 24, resulting in a design effect of 3.0 using the upper 95% confidence limit for ICC. Thus, we aimed at (and succeeded in) recruiting a total of 18 schools and at least 450 girls.

Summary of changes made to the sample size

After incorporating lessons learnt in a similarly designed feasibility cluster RCT,[39] we anticipated a 10% dropout between baseline data collection and intervention start. To account for this difference we increased the maximum recruitment to 33 at the school level (from an initial maximum of 30 pupils per school).

Blinding

All project staff, excluding the Trial Manager and Process Evaluation Research Associate, were blinded to the allocation of intervention arms. Primary and secondary analyses were conducted blind by the statistical analysis team. Blinding was broken at the presentation of the main trial results to the Trial Management Group on 2 February 2015. Statisticians were unblinded at this point in order to undertake the per-protocol analysis which examined the intervention effect for girls who had adhered to the intervention and the statistical elements of the process evaluation which was conducted only in intervention schools.

Process evaluation methods

Overview

A process evaluation, reporting on consent, recruitment, dose, implementation fidelity, theory-based fidelity and intervention receipt, was conducted in the nine intervention schools. It included both qualitative and quantitative components. The aim of the qualitative component of the process evaluation was to explore the views of girls, dance instructors and intervention school staff to: (1) identify elements of the intervention that worked well; (2) identify potential improvements; (3) examine dance instructors' experiences of delivering and girls' experiences of receiving an intervention based on SDT[76] and their psychological responses; and (4) identify considerations for dissemination/rollout of the project.[64]

The quantitative element of the process evaluation was conducted using self-report questionnaires and instructor observations. To conduct these measures, visits were made to all nine intervention schools on four randomly chosen occasions during the intervention. No visits were made during the first four sessions to avoid adversely affecting the settling in period for dance instructors and girls. Similarly, no visits were made during the last four sessions of the intervention to avoid clashes/overlap with the T1 data collection.

Dose

The dose of the intervention (number of sessions delivered) was recorded at each school as a percentage of the intended 40 sessions.

Attendance at the dance sessions was recorded in registers provided to the dance instructors. These data were used to calculate compliance adherence to the intervention, defined as girls attending two-thirds of the total sessions available at their school.

At T1, girls receiving the intervention completed a questionnaire to understand the reasons for the level of attendance. For dance sessions with fewer than three girls, the relevant instructor was asked if there was a reason for the low attendance (e.g. school camp, sports day). The instructor's response was recorded as 'no reason', 'school or year event' or 'communication breakdown' to help explain any low levels of attendance in analyses.

The following definitions were applied to identify three types of withdrawal.

1. Pre-intervention withdrawal: a child who attended no dance sessions but attended data collection at T1 and T2.
2. Withdrawal during intervention period: a child who attended only one dance session and still attended data collection at T1 and T2.
3. Complete study withdrawal: a child who may have attended some dance sessions but notified project staff that they wished to withdraw from the study and future data collection.

Implementation fidelity

Implementation fidelity was assessed by instructors indicating the extent ('very', 'somewhat' or 'not at all') to which each session delivered reflected the session plan in the manual.

Theory-based fidelity

The intervention was based on the premise that supporting the girls' psychological needs would lead to increases in autonomous motivation and PA (see *Chapter 1, Theories of behaviour change: self-determination theory in physical activity research*). To assess the extent to which the intervention was delivered consistently with the tenets of SDT, a team member observed four randomly selected sessions in intervention schools using a measure developed by Haerens *et al.*[59] During the observations the extent to which the dance instructors' teaching styles were needs-supportive was rated. Five teaching practices were rated, and an average of these five measures were calculated to provide an overall score. The original procedure adopted a video rating system. For ethical and practical reasons, the observation system was adapted to use a combination of visual and audio recordings. The first observation in each school was conducted by two researchers to allow the main rater to reflect on their interpretations in the observation scoring process. A subsample (6/36 sessions) of the audio recordings was double coded (by the main rater and a team member with expertise in SDT) to check inter-rater reliability. Only the scores of the main rater were used in the analysis.

As noted above (see *Psychosocial questionnaire*), to measure perceptions of autonomy support provided by the dance instructor, all girls in intervention schools were asked to complete six items from the Sport Climate Questionnaire at T1.[72,73]

Intervention receipt

At the end of the four observed sessions in each school, girls were asked to complete a perceived exertion[77] and enjoyment[78] questionnaire.

Qualitative process evaluation design

At the end of the 20-week intervention, semistructured interviews were conducted with the dance instructors who delivered the intervention and school contacts. School contacts were individuals within schools who facilitated the intervention and were the main contact for study staff. A focus group with participant girls was conducted in each intervention school.

Recruitment

All dance instructors ($n = 10$) and school contacts ($n = 9$) took part in semistructured interviews. A sample of 10 girls (six to eight girls and two reserves) per intervention school were purposively selected to reflect the views of girls from different thirds of dance session attendance within each school. To ensure that the focus group girls were able to share intervention experiences, girls who attended fewer than three sessions were excluded. Three individuals from the middle and highest attendance thirds and two individuals from the lowest third were randomly selected and invited to interview. Finally, across all thirds, two reserve girls were randomly selected. Girls absent from school on the day of the focus group were replaced with a reserve where possible.

Interview topic guides

Interview topic guides were developed for each informant group (three guides in total). The focus group guide (see *Appendix 3*) explored factors that encouraged or discouraged participation, elements that were enjoyed or not, views on dance instructors' teaching styles and experiences of how the group worked over time. The guide also explored the receipt of the intervention in terms of the theoretical constructs of SDT. In particular, questions probed perceptions of autonomy, competence and relatedness, how these were supported by the dance instructor and participants motivational experiences.[76]

The dance instructor interview guide (see *Appendix 4*) explored experiences of intervention training and potential improvements, implementation and dissemination. In relation to implementation, interviews addressed successes and challenges associated with intervention delivery. Fidelity to the session-plan manual and experiences of delivering the SDT-underpinned intervention were also explored [including how instructors supported the girls' basic psychological needs (autonomy, competence and relatedness)].

School contacts discussed the logistical issues of the project within school, including recruitment, intervention delivery, data collection and improvements (see *Appendix 5*). Views were also sought on considerations for the dissemination of the intervention.

Interviews and focus groups were recorded using an encrypted digital recorder [Olympus DS-3500 (Olympus UK, Southend-on-Sea, UK)] and audio recordings were transcribed verbatim and fully anonymised. Transcripts were compared with the audio recordings and amended as necessary to ensure accuracy. Written informed consent was gained from school contacts and dance instructors before the interview and written consent was gained from children's parents when they signed up for the study.

Qualitative analysis

The framework method, a form of thematic analysis defined by the systematic production of a matrix which reduces data into a series of codes, was used.[79] This method is useful for condensing and summarising large qualitative data sets. It is an approach that does not exclusively align with a particular theoretical or epistemological perspective and, therefore, can be applied using an inductive or deductive approach.[79] Analysis consisted of the following six steps.

1. Transcripts were read and reread to form preliminary impressions of the data.
2. Initial codes were created to summarise and interpret data. Both inductive and deductive coding was used. Deductively, the analysis probed data to understand whether or not the intervention was delivered in line with SDT. Pre-defined codes were created from the central tenets of SDT.[45] In addition, a pre-defined code 'school context' examined the potential interaction between school context (e.g. participant- and area-level demographic factors and school culture) and intervention delivery and experience. The pre-defined codes were broad, with the primary purpose of categorising relevant information, which was further interrogated. Initial codes were inductively produced independently by four researchers (JK, ME, SS and TM) who each coded three transcripts (one from each informant group).
3. Initial codes were discussed, refined and combined to produce three coding frameworks, one for each informant group.
4. The coding frameworks were applied to all remaining transcripts by three researchers (JK, ME and TM). New and redundant codes were discussed in frequent meetings of the analysis group (JK, ME, SS and TM) and iterative amendments were made to each framework.
5. The coded data were then entered into a framework matrix in NVivo version 10 (QSR International, Warrington, UK). The framework condensed the volume of data and summarised codes with illustrative quotations. This process facilitated reflections on salient codes between participants within each informant group.
6. The three frameworks were triangulated using the convergence coding matrix approach,[80] in which the codes for informant groups were compared to assess the degree of convergence as either: 'Agreement', 'Partial agreement' and 'Silence' or 'Dissonance' (see *Appendix 6*). In total there was agreement between informant groups in 22 themes, partial agreement in 26, silence in 39 and dissonance in 6 out of 77 themes.

To ensure trustworthiness, we applied four criteria: credibility, transferability, dependability and confirmability (see *Appendix 7*).[81] The main themes elicited from the interviews are presented in *Chapters 6–8* and are supported by illustrative, relevant and representative quotations.

Statistical analysis

The analysis and presentation of the trial was carried out in accordance with Consolidated Standards of Reporting Trials (CONSORT) guidelines, with the primary comparative analyses being conducted on an intention-to-treat basis and due emphasis placed on CIs for the between-arm comparisons. To take appropriate account of the hierarchical nature of the data, we used multivariable, mixed-effects, linear regression to estimate the difference in the primary outcome for intervention group versus control, adjusting for baseline MVPA and randomisation variables.

For the baseline (T0) summary statistics, the mean (SD) was reported for normally distributed variables and the median [interquartile range (IQR)] for skewed variables. Normality was determined by the Shapiro–Wilks test, histograms and normal probability plots. Proportions were reported as percentages. Summary statistics were reported for each group. A kernel density estimation was used to calculate the probability density function of non-parametric continuous variables, and, thus, kernel smoother plots were used to describe such distributions.

Linear mixed models were used to assess the primary and secondary outcomes, and a logistic model was used for proportional data. The variables to be included in the regression models were predetermined in the analysis plan. A typical model included the outcome at T2 as the dependent continuous variable (e.g. weekday MVPA at T2), whereas the independent variables consisted of the main variable of interest (the two arms of the trial) adjusted for T0 (e.g. weekday MVPA at T0), the number of valid weekdays at T0, the number of valid weekdays at T2 and the variables used in the randomisation process. Model assumptions were checked by testing the residuals for normality and plotting the linear predictor against the residuals to ensure that no trend was present.

After the statistician was unblinded, a per-protocol analysis was performed. The trial allocation and attendance data were merged with the accelerometer data and a new variable 'adherence' was generated. For the T2 analysis, all girls who had not adhered to the intervention in the intervention arm were dropped from the data set and the regression model for outcome 'weekday MVPA at T2' was rerun on this data set. This type of analysis was repeated for 'weekend MVPA at T2', 'weekday MVPA at T1' and 'weekend MVPA at T1'. Owing to the bias introduced by dropping girls who did not adhere in the intervention group in the per-protocol method, a complier average causal effect (CACE) analysis was conducted, which included all girls, regardless of whether or not they adhered. Each girl in both groups was given a new variable of adherence (0 = no, 1 = yes) whereby all girls who adhered in the intervention group were coded 1 and all girls who did not adhere were coded 0, and all girls in the control group who adhered to the control (i.e. did not move to an intervention school and start a dance class) were also coded as 0. Instrumental variable regression was then conducted to identify whether or not there was any difference between the two arms with respect to adherence.

We intended to explore whether or not any effect of the intervention on the primary outcome was mediated by autonomous and controlled motivation for PA and/or perceptions of autonomy, competence and relatedness need satisfaction in PA, using the methods described by Emsley *et al.*[82] However, as there was no effect on the primary or secondary outcomes, we did not conduct the mediation analysis.

Quantitative process evaluation data (e.g. attendance rates) were analysed using appropriate descriptive statistics for normally distributed variables (using the mean and SD) and variables without such a distribution (using the median and IQRs). Ratings of instructors' teaching styles were made from visual observations and audio recordings of 21 items. Each item was rated in 5-minute intervals during the session, these values were summed and divided by the number of intervals in the session across five teaching elements: relatedness support; structure before the activity; structure during the activity; autonomy support; and controlling teaching behaviour. A rating of the overall impression of the session was also given for autonomy-supportive teaching style, structure and instructor relatedness support. All analyses were performed using Stata 13.1 (StataCorp LP, College Station, TX, USA).

Economic evaluation

Full details of the economic evaluation are shown in *Chapter 4*.

Chapter 3 Trial results

In total, 571 girls were recruited to the BGDP trial. 284 girls from nine schools were randomly allocated to the intervention arm and 287 girls from nine schools were allocated to the control arm. *Figure 2* presents the CONSORT flow diagram for the trial and summarises participation in the three measurement time points (T0, T1, T2) and withdrawals (with reasons) from the study.

Recruitment

Dance instructor recruitment

It was possible to recruit dance instructors to deliver a relatively long duration after-school intervention in secondary schools. Recruitment of instructors was more difficult for schools that were not located close to an urban centre (Bath or Bristol). The more isolated a school was, the more difficult it became to find willing and able instructors to deliver sessions on the desired days. Four dance instructors could not participate when approached. Reasons dance instructors cited for not participating included travel time (worsened by city centre traffic) and distance to the school (from home or other venues). Reserve instructors were recruited to cover absences.

School recruitment

There were 41 mainstream secondary schools in the three local areas: Bristol City Council, Bath and North East Somerset Council and North Somerset Council. Four schools were ineligible (one school was male only, three schools had fewer than 30 registered Year 7 girls). The remaining 37 schools were sent postal recruitment materials (a brief study flyer, detailed study information and an expression of interest form). Follow-up telephone calls and e-mails were sent shortly after postal materials (including relevant attachments). The principal investigator and trial manager also spoke at a PE teachers' meeting in one of the local areas.

Recruitment materials were sent to schools both by post and electronically. It is difficult to ascertain whether or not the materials made it to a suitable staff member (e.g. head teacher or PE teacher). It is often difficult to identify the most appropriate staff member to receive recruitment materials. In certain circumstances this may mean that recruitment materials do not reach the most relevant individual.

Of the 37 schools eligible to participate, 18 initially signed up. The recruitment campaign continued in order to ensure that there were reserve schools if needed (five reserve schools were recruited in all). An additional school wanted to participate but withdrew owing to geographical and transport restrictions. As such, from those schools eligible to participate ($n = 37$), just under two-thirds ($n = 24$) expressed an interest to participate.

After attempts were made to recruit the minimum number of Year 7 girls ($n = 25$) in each school, four schools had to be replaced with reserves as they were unable to fulfil the minimum recruitment criteria. Sufficient numbers of girls were recruited from these schools.

Child recruitment

At the point of school recruitment, dates were arranged on which pupil recruitment could take place. All schools received the same recruitment procedure: (1) a taster session; and (2) detailed information (verbal and written) on what participation in the study would entail. Taster sessions were usually arranged in place of PE lessons, thus enabling all Year 7 girls eligible to take part in PE lessons to have the opportunity to participate (the sessions were for females only). Taster sessions opened with a brief introduction to the study (by study team members). After this, a dance instructor led the girls through a standardised dance session so the girls could experience what the intervention sessions would be like. Between two and six taster sessions were received in each school depending on school size.

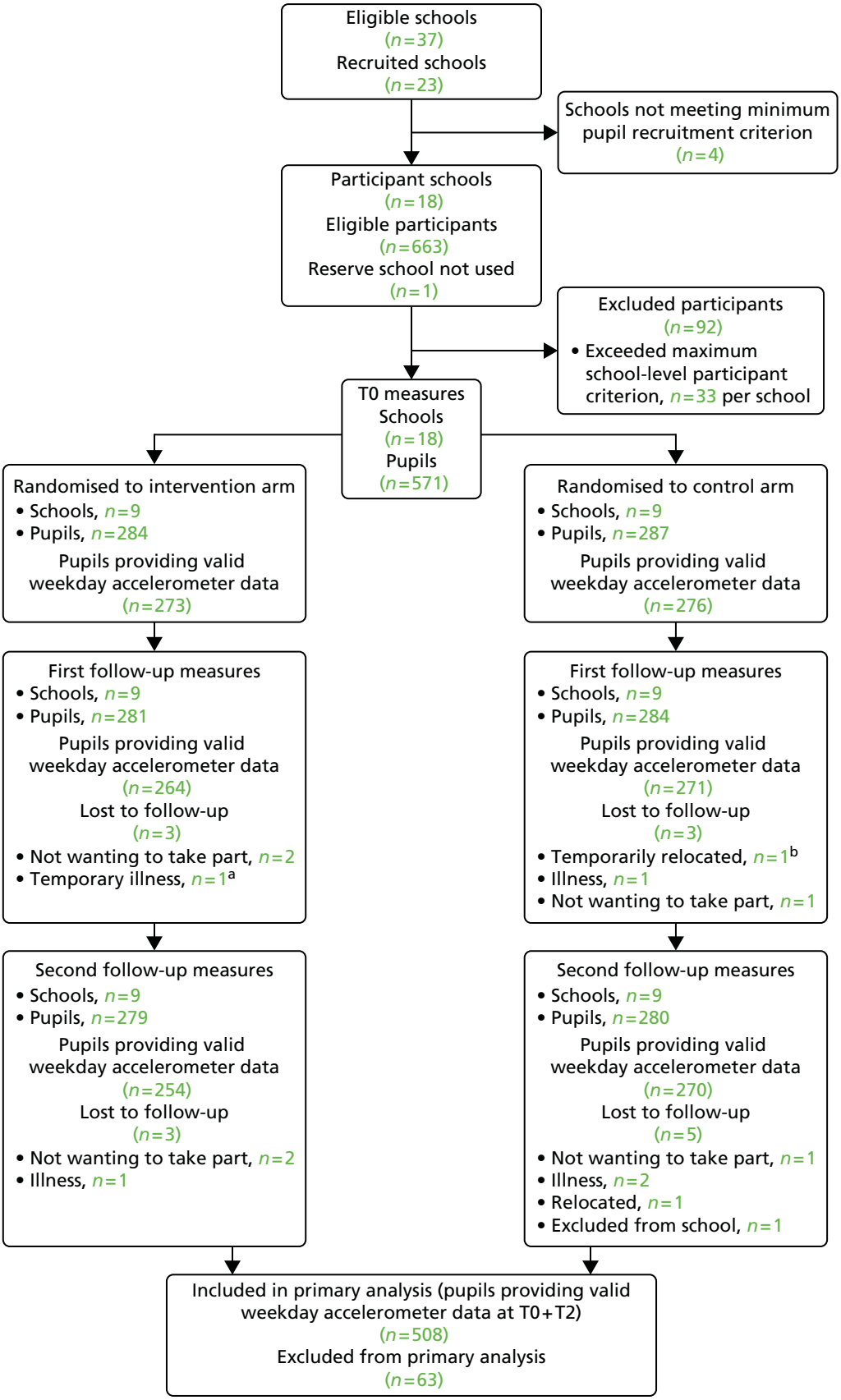

FIGURE 2 Trial profile for the BGDP (CONSORT flow diagram). a, Participant had suspected long-term illness, but returned for T2 measures; b, participant temporarily relocated at T1 and returned at T2.

At the end of the taster session a study team member explained what participation in the study would entail (focusing particularly on school randomisation, data collection and what girls would be asked to commit to in order to participate). Following the briefing girls were given recruitment packs for themselves (including detailed information on the study) and for their parents (including a study information sheet, informed consent form and a demographic questionnaire). If a child wanted to participate they had to return a completed informed consent and demographics form by an arranged date.

The child recruitment campaign began in the same month in which the Year 7 girls began high school (in some cases recruitment began in the first week of term). As such, the girls were new to the school and in the process of forming social ties. This was a notably busy and often confusing period for the girls, especially in some schools.

Issues encountered during recruitment

A less conventional aspect of the recruitment campaign was the provision of taster sessions in schools. Organising taster sessions was logistically difficult. A total of 65 taster sessions took place within a short time period. These were delivered by six instructors and study staff made recruitment presentations at each taster session. Schools were largely confined to scheduling taster sessions in place of PE lessons, meaning that there was little flexibility on their part.

When schools withdrew from the study (owing to insufficient pupil sign-up) there were time pressures on recruiting replacements. Data collection was planned to take part between September and October 2014; thus, when replacement schools were sought they had to be recruited quickly (as taster sessions had to be arranged and necessary information handed out and returned).

No adverse events were reported during the intervention delivery.

Results

Descriptive statistics

Data provision

Table 6 shows the number of girls who provided valid data, including those who returned an accelerometer (and therefore for whom there were accelerometer data available) at each time point. Valid weekday data were defined as data from ≥ 2 valid weekdays; valid weekend data were defined as data from ≥ 1 valid weekend day. At T0 height/weight data were available for 571 girls, that is, 284 in the intervention and 287 in the control group. Accelerometer data were available for 568 girls (99.47%), with 282 and 286 girls in the intervention and control groups, respectively. Of those girls for whom accelerometer data were available at T0, 549 (96.15%) had valid weekday data and 431 (75.48%) had valid weekend data. At T1, 561 (98.29%) girls returned an accelerometer, 535 (94.69%) had valid weekday data and 347 (61.42%) had valid weekend data. At T2, 557 (99.64%) girls returned an accelerometer; of these, 524 (93.74%) had valid weekday data and 320 (57.25%) had valid weekend day data. There were 508 (88.97%) girls who had valid weekday data at both T0 and T2, and 521 (91.24%) girls who had valid data at both T0 and T1; these figures are shown in the 'T0 + T2' and 'T0 + T1' sections in *Table 6*. A breakdown by group is also provided.

TABLE 6 Data provision for girls at each time point by trial arm

Variable	Control, *n* (%)	Intervention, *n* (%)	Total, *n* (%)
T0			
Height (cm)	287 (50.26)	284 (49.74)	571 (100.00)
Weight (kg)	287 (50.26)	284 (49.74)	571 (100.00)
Psychosocial questionnaire	287 (50.26)	284 (49.74)	571 (100.00)
EQ-5D-Y	287 (50.26)	284 (49.74)	571 (100.00)
Accelerometer returned	286 (50.08)	282 (49.39)	568 (99.47)
Valid weekday[a]	276 (48.33)	273 (47.81)	549 (96.15)
Valid weekend[a]	221 (38.70)	210 (36.78)	431 (75.48)
T1			
Height (cm)	284 (50.27)	281 (49.73)	565 (100.00)
Weight (kg)	284 (50.27)	281 (49.73)	565 (100.00)
Psychosocial questionnaire	284 (50.27)	281 (49.73)	565 (100.00)
EQ-5D-Y	284 (50.27)	281 (49.73)	565 (100.00)
Accelerometer returned	282 (49.91)	279 (49.38)	561 (98.29)
Valid weekday[a]	271 (47.96)	264 (46.73)	535 (94.69)
Valid weekend[a]	188 (33.27)	159 (28.14)	347 (61.42)
T2			
Height (cm)	280 (50.09)	279 (49.91)	559 (100.00)
Weight (kg)	280 (50.18)	278 (49.82)	558 (99.82)
Psychosocial questionnaire	280 (50.09)	279 (49.91)	559 (100.00)
EQ-5D-Y	280 (50.09)	279 (49.91)	559 (100.00)
Accelerometer returned	280 (50.09)	277 (49.55)	557 (99.64)
Valid weekday[a]	270 (48.30)	254 (45.44)	524 (93.74)
Valid weekend[a]	170 (30.41)	150 (26.83)	320 (57.25)
T0 + T1			
Accelerometer returned	281 (49.21)	277 (48.51)	558 (97.72)
Valid weekday[b]	265 (46.41)	256 (44.83)	521 (91.24)
Valid weekend[b]	159 (27.85)	130 (22.77)	289 (50.61)
T0 + T2			
Accelerometer returned	279 (48.86)	275 (48.16)	554 (97.02)
Valid weekday[b]	262 (45.88)	246 (43.08)	508 (88.97)
Valid weekend[b]	145 (25.39)	124 (21.72)	269 (47.11)

a Percentages are taken as a proportion of the total number of girls providing data at that time point.
b Percentages are taken as a proportion of the total number of girls providing data at T0.

Baseline data

Table 7 describes the baseline data. Medians (with IQRs) were reported for continuous accelerometer outcomes, as the data were skewed. Of the 282 girls who returned accelerometers in the intervention group, 273 (96.81%) provided valid weekday data. For the control group, 276 (96.50%) girls provided valid weekday data. The intervention group had 74.47% of girls with valid weekend data compared with 77.27% of girls in the control group.

The number of girls who had valid data at T0 and T1 is shown in *Table 8*. To be included in many secondary outcomes, pupils were required to have valid accelerometer data for both T0 and T1.

TABLE 7 Baseline data descriptive statistics

	Control				Intervention			
Variable	***n***	**Mean**	**SD**	**IQR**	***n***	**Mean**	**SD**	**IQR**
Mean height (cm)	287	149.44	7.42		284	149.27	7.04	
Median weight (kg)[a]	287	41.90		35.90–49.30	284	41.50		37.15–49.05
BMI (kg/m^2)	287	19.53	3.70		284	19.48	3.44	
BMI[b]	285	0.38	1.21		279	0.40	1.16	
	n	**Median**	**IQR (25th quartile)**	**IQR (75th quartile)**	***n***	**Median**	**IQR (25th quartile)**	**IQR (75th quartile)**
IMD score summary statistic	287	17.99	9.81	35.35	282	15.68	9.29	23.91
Accelerometer provision	***n*^{1}**	***n*^{2}**	**%**		***n*^{1}**	***n*^{2}**	**%**	
Proportion with valid weekday data (≥ 2 valid weekdays)[c]	286	276	96.50		282	273	96.81	
Proportion with valid weekend day data (≥ 1 valid weekend days)	286	221	77.27		282	210	74.47	
Weekday accelerometer data	***n***	**Median**	**IQR (25th quartile)**	**IQR (75th quartile)**	***n***	**Median**	**IQR (25th quartile)**	**IQR (75th quartile)**
Total valid weekday minutes	280	3519.17	2715.08	4027.58	280	3267.00	2571.50	3972.08
Average valid weekday minutes	280	787.46	725.35	832.69	280	779.36	724.32	829.31
Total valid weekday CPM	280	431.78	352.53	523.02	280	476.30	396.17	555.07
Average weekday MVPA minutes	280	49.15	37.38	60.65	280	53.25	41.50	68.03
Average weekday light PA minutes	280	193.27	166.71	219.80	280	196.57	171.62	225.75
Average weekday sedentary minutes	280	528.35	474.25	581.08	280	520.26	463.47	568.38

continued

TABLE 7 Baseline data descriptive statistics (*continued*)

	Control				Intervention			
Weekend accelerometer data	***n***	**Median**	**IQR (25th quartile)**	**IQR (75th quartile)**	***n***	**Median**	**IQR (25th quartile)**	**IQR (75th quartile)**
Total valid weekend day minutes	221	1238.50	655.00	1440.00	210	1215.33	660.50	1389.00
Average valid weekend day minutes	221	694.75	618.17	759.17	210	675.96	609.75	736.08
Total valid weekend day CPM	221	378.64	296.24	533.03	210	416.18	324.03	558.45
Average weekend day MVPA minutes	221	32.50	22.17	48.33	210	35.38	24.58	54.33
Average weekend day light PA minutes	221	181.50	154.42	214.08	210	192.83	155.08	223.75
Average weekend day sedentary minutes	221	476.58	398.00	529.42	210	437.25	384.83	492.50
Psychosocial variables	***n***	**Mean**	**SD**		***n***	**Mean**	**SD**	
Autonomous motivation dance	287	3.91	0.58		284	3.91	0.65	
Autonomous motivation PA	287	4.01	0.63		284	3.96	0.74	
Controlled motivation dance	287	1.95	0.72		284	1.94	0.63	
Controlled motivation PA	287	2.25	0.76		284	2.17	0.74	
Autonomy need satisfaction	287	5.67	1.00		284	5.62	1.05	
Competence need satisfaction	287	5.24	1.19		284	5.17	1.23	
Relatedness need satisfaction	287	5.89	1.26		284	5.89	1.31	
Self-esteem	287	4.96	0.81		284	4.97	0.77	

IMD, Index of Multiple Deprivation; n^1, number of girls with any valid accelerometer data; n^2, number of girls meeting inclusion criteria.
a Median and IQR reported for weight, as it is non-normal.
b Age-adjusted BMI score. Data missing owing to date of birth not being reported.
c Percentage of girls who had fewer than two valid weekdays of accelerometer data at T0.

TABLE 8 T0 and T1 valid data discrepancies

		Valid data T1 (%)		
		No	**Yes**	**Total**
Valid data T0 (%)	No	6 (1.11)	11 (1.97)	17 (3.05)
	Yes	20 (3.58)	521 (93.37)	541 (96.95)
	Total	26 (4.66)	532 (95.34)	558 (100.00)

Primary analysis

In order to conduct the primary analyses, the T0 and T2 data sets were merged, including information on the variables used for school randomisation (local authority, school size, baseline mean MVPA and deprivation) for each girl. The main analyses (*Table 9*; this table also includes results of the per-protocol CACE analysis, which are discussed further below, see *Complier average causal effect analysis*), which adjusted for baseline values, found no evidence for a difference in weekday MVPA at T2 in girls allocated to the intervention group (mean 56.55 minutes) compared with those in the control group (mean 53.15 minutes) (adjusted difference in means –1.52, 95% CI –4.76 to 1.73). There was also no difference for the secondary outcome of weekday MVPA at T1 (adjusted difference in means –1.52, 95% CI –5.03 to 1.98). No evidence was found for a difference in any accelerometer-derived variables at T1 or T2.

Model checking

To ensure that the model was a good fit for the data, residuals in *Figure 3* should have a mean of zero and constant variance. The mean of the residuals is -4.30×10^{-8} and the mean of the standardised residuals is -1.34×10^{-9}, so the fit is relatively normal.

TABLE 9 Means and SDs by trial arm and linear mixed model adjusted for imbalance at baseline for weekday MVPA at T1 and T2

	Control			Intervention				
Variable	*n*	Mean	SD	*n*	Mean	SD	Intervention vs. control adjusted difference in means (95% CI)[a]	*p*-value
T2 mean weekday MVPA[b]	262	53.15	19.61	246	56.55	21.92	–1.52 (–4.76 to 1.73)	0.359
T1 mean weekday MVPA[c]	265	57.69	19.39	256	60.46	22.98	–1.52 (–5.03 to 1.98)	0.395
T2 MVPA weekday CACE analysis	508	–	–	–	–	–	–4.79 (–14.53 to 4.96)	0.336
T1 MVPA weekday CACE analysis	521	–	–	–	–	–	–4.86 (–18.41 to 6.91)	0.365

a For between-group differences the control group is the reference group, with models adjusted for baseline mean weekday MVPA, local education authority, school size, school-level deprivation, school-level baseline MVPA, the number of total valid weekdays at T0, the number of total valid weekdays at T2 (or T1) and school-level clustering.
b Primary comparison.
c Key secondary outcome.
Dashes indicate that there are no data available.

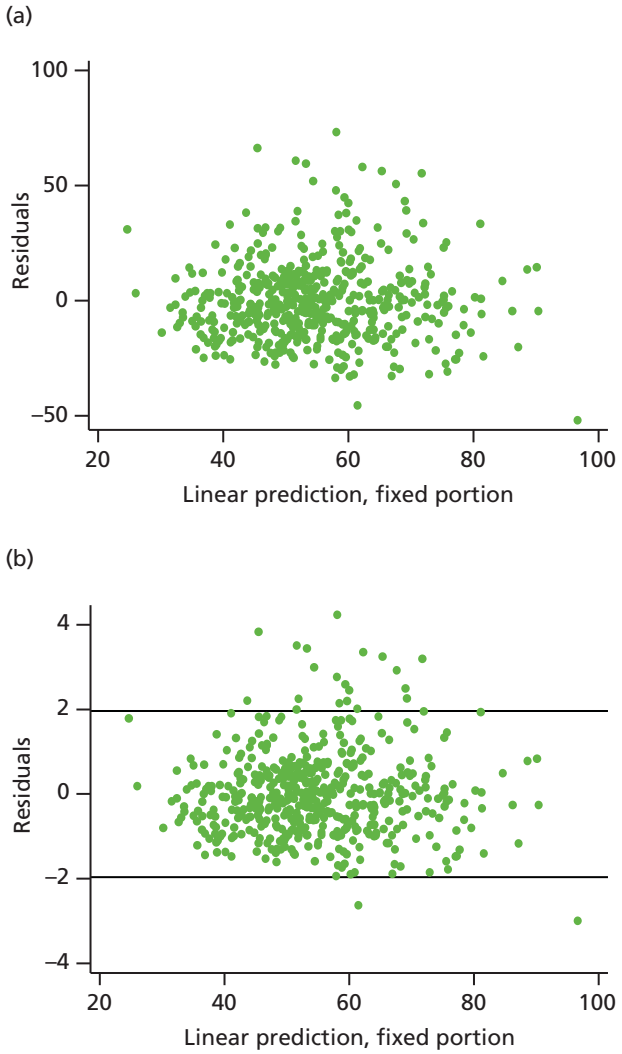

FIGURE 3 Residual plots for the main model. (a) Plot of residuals; and (b) plot of standardised residuals. Twenty-two observations lie outside 1.96, expected to be 5%, 22/508 = 4.3%.

Secondary analysis

Crude results

Means and SDs for accelerometer-assessed outcomes at T1 and T2 are presented in *Table 10*. No effect was detected at T1 or T2 for any outcome.

Model checking

Figure 4 shows the residual plots for the key secondary model. The mean of the residuals is -1.60×10^{-8} and the mean of the standardised residuals is 6.48×10^{-10}, so approximately 0.

Other secondary results

The proportion of girls who had ≥ 60 minutes of MVPA per valid weekday at T0 was 97 (39.43%) for the intervention group and 71 (27.10%) for the control group (*Table 11*). This figure increased for the control group by 5.34% between T0 and T2 and decreased by 0.41% for the intervention group. The number of girls who had ≥ 60 minutes of weekend MVPA at T0 was 27 for the intervention group, which decreased to 19 at T2. For the control group it was 23 at T0; this decreased to 18 at T2.

TABLE 10 Means and SDs by trial arm and linear mixed model adjusted for imbalance at baseline for accelerometer assessed secondary outcomes at T1 and T2

	Control			Intervention				
Variable	*n*	Mean	SD	*n*	Mean	SD	Intervention vs. control adjusted difference in means (95% CI)[a]	*p*-value
T2								
Mean weekend day minutes of MVPA	145	36.56	26.16	124	39.65	23.21	–1.75 (–7.51 to 4.01)	0.552
Mean weekday CPM	262	446.83	137.81	246	478.75	144.94	–2.44 (–25.25 to 20.38)	0.834
Mean weekend CPM	145	405.04	228.96	124	450.98	263.89	–4.11 (–61.07 to 52.86)	0.888
Proportion of girls meeting 60 minutes of MVPA per weekday[b]	262	0.32	0.47	246	0.39	0.49	–1.18 (–1.82 to 0.76)	0.458
Proportion of girls meeting 60 minutes of MVPA per weekend day[b]	145	0.12	0.33	124	0.15	0.36	–1.11 (–2.39 to –0.52)	0.787
Mean weekday sedentary minutes	262	533.01	80.54	246	515.12	80.22	–6.79 (–23.60 to 10.03)	0.429
Mean weekend sedentary minutes	145	475.14	95.22	124	463.66	105.92	0.62 (–22.42 to 23.66)	0.958
T1								
Mean weekend day minutes of MVPA	159	42.57	27.71	130	48.92	32.19	1.26 (–5.70 to 8.22)	0.723
Mean weekday CPM	265	500.35	177.32	256	529.42	157.72	–7.48 (–35.06 to 20.11)	0.595
Mean weekend CPM	159	492.21	371.47	130	543.67	284.39	6.27 (–72.10 to 84.65)	0.875
Proportion of girls meeting 60 minutes of MVPA per weekday[b]	265	0.42	0.49	256	0.47	0.50	–1.11 (–1.68 to –0.73)	0.637
Proportion of girls meeting 60 minutes of MVPA per weekend day[b]	159	0.17	0.38	130	0.27	0.45	–0.82 (–1.56 to –0.43)	0.543
Mean weekday sedentary minutes	265	522.96	85.46	256	502.91	87.01	–7.72 (–27.32 to 11.87)	0.449
Mean weekend sedentary minutes	159	464.13	92.28	130	452.46	98.21	–8.94 (–31.91 to 14.04)	0.446

a For between-group differences the control group is the reference group, with models adjusted for baseline value, local education authority, school size, school-level deprivation and school-level clustering.
b Odds ratios presented in coefficient column.

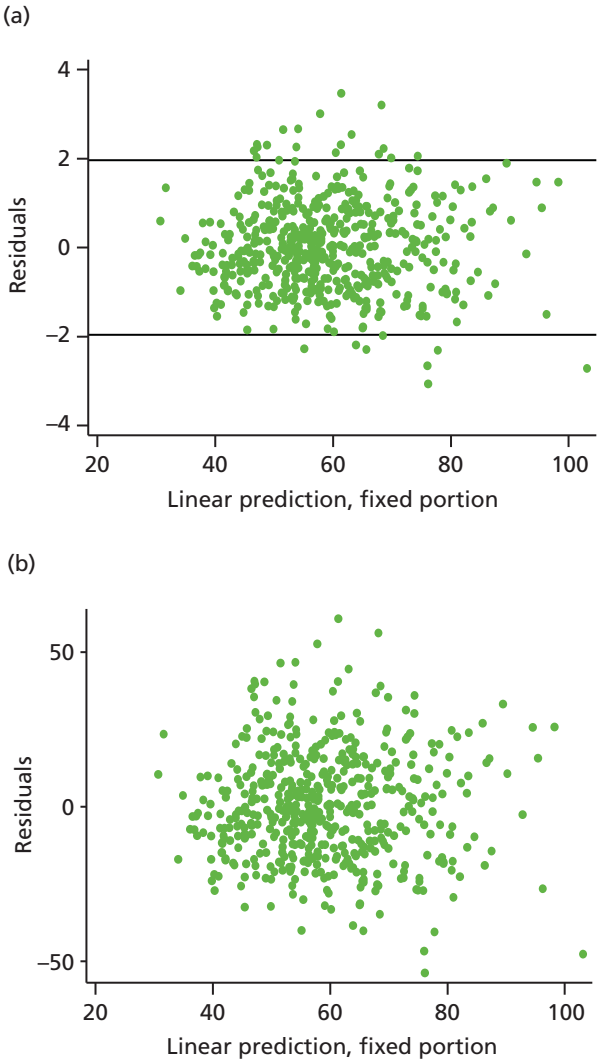

FIGURE 4 Residual plots for the key secondary outcome model. (a) Plot of residuals; and (b) plot of standardised residuals. Twenty-seven observations lie outside 1.96, expected to be 5%, 27/521 = 5.18%.

TABLE 11 Proportion of girls with ≥ 60 minutes of MVPA per valid weekday or weekend at T0 and T2

Variable	Time	Control (%)	Intervention (%)	Total (%)	[a]χ^2
Weekday, $n = 508$ (control = 262; intervention = 246)	T0	71 (27.10)	97 (39.43)	168 (33.07)	0.003
	T2	85 (32.44)	96 (39.02)	181 (35.63)	0.122
Weekend, $n = 269$ (control = 145; intervention = 124)	T0	23 (15.86)	27 (21.77)	50 (18.59)	0.214
	T2	18 (12.41)	19 (15.32)	37 (13.75)	0.490

a Chi-squared tests, for the first row, the trend between valid weekday girls at T0 who had ≥ 60 minutes of MVPA per valid weekday between the two groups.

For the T0 + T1 data set, which had 521 girls with valid weekday data at both T0 and T1, there were 102 (39.84%) girls who had ≥ 60 minutes of weekday MVPA at T0, which increased by 7.43% to 121 (47.27%) at T1. For the control group there were 71 (26.79%) girls who had ≥ 60 minutes of weekday MVPA at T0, which increased by 15.10% to 111 (41.89%) at T1 (*Table 12*). The percentage of girls in the intervention group who had ≥ 60 minutes of weekend MVPA increased by 5.38%; this decreased by 1.89% for the control group.

Compliance adherence

Compliance adherence was achieved if a girl attended two out of three of the sessions available at her school. There were four schools that hosted a total of 40 sessions, one school hosted 39 sessions, one hosted 38 sessions and three schools hosted 37 sessions (*Table 13*).

Of the 256 girls who had valid weekday data at T0 and T1, 83 (32.42%) adhered to the intervention. Of the 246 girls who had valid weekday data at T0 and T2, 81 (32.93%) adhered to the intervention (*Table 14*). The number of girls who adhered to the intervention is slightly higher at T1 than at T2 because there were more girls who had valid data at T1.

Table 15 shows the breakdown of adherence by school. Generally schools with a higher deprivation score had lower adherence and schools with a lower deprivation score had higher adherence.

TABLE 12 Proportion of girls with ≥ 60 minutes of MVPA per valid weekday or weekend at T0 and T1

Variable	Time	Control (%)	Intervention (%)	Total (%)	χ^2
Weekday, *n* = 521 (control = 265; intervention = 256)	T0	71 (26.79)	102 (39.84)	173 (33.21)	0.002
	T1	111 (41.89)	121 (47.27)	232 (44.53)	0.217
Weekend, *n* = 289 (control = 159; intervention = 130)	T0	30 (18.87)	28 (21.54)	58 (20.07)	0.573
	T1	27 (16.98)	35 (26.92)	62 (21.45)	0.041

TABLE 13 Number of total sessions per school

Number of sessions	Number of schools
40	4
39	1
38	1
37	3

TABLE 14 Adherence data for the intervention group

	Adhered		
Variable	No (%)	Yes (%)	Total
All	200 (70.42)	84 (29.58)	284
Valid weekday T0 + T1	173 (67.58)	83 (32.42)	256
Valid weekday T0 + T2	165 (67.07)	81 (32.93)	246

TABLE 15 Adherence data by school showing school-level deprivation

School identification number	Deprivation (%)[a]	Adherence (%)
23	6.9	20 (62.50)
51	9.8	13 (41.94)
72	10.7	10 (33.33)
61	13.5	13 (44.83)
32	16.9	13 (43.33)
53	29.4	1 (4.17)
62	35.4	4 (20.00)
42	42.9	5 (16.13)
21	48	4 (13.79)

a Deprivation shows the percentage of children within the school who were eligible for the Department of Education's Pupil Premium (funding given to schools to support the attainment gap between disadvantaged pupils and their peers). The higher the score, the greater the level of deprivation.

Complier average causal effect analysis

A CACE analysis was used to assess differences between those girls who adhered to the intervention and those who did not. A CACE analysis uses random allocation as an instrumental variable to calculate the effect of an intervention for those who adhered to it, by comparing those girls observed to attend the dance sessions with those in the comparison group who would have attended if invited. Although the latter group cannot be identified from the comparison group as a whole, their outcome can be estimated under the assumptions of a CACE analysis.[83] This found no evidence of a difference between the two groups for weekday MVPA at T2 or T1 (see *Table 9*).

Adherence analysis

An adherence analysis was performed which excluded anyone from the control group. The same regression model was used as for the primary and secondary analyses; however, the trial arm variable was replaced with adherence. The results suggest that there was no evidence of a difference in MVPA at T2 or T1 when adjusting for MVPA at T0 and minimisation variables for those who attended more than two-thirds of the dance sessions compared with those who attended less than two-thirds (*Table 16*). From the girls who provided valid accelerometer data at T0 and T2, 81 met the adherence criteria and 165 did not. The unadjusted mean minutes of weekday MVPA at T2 were 53.56 minutes (SD 18.87 minutes) for the adhered group and 58.02 minutes (SD 23.18 minutes) for the girls who did not meet the adherence criteria. At T1 the mean was 59.75 minutes (SD 21.56 minutes) for girls who adhered and 60.79 minutes (SD 23.69 minutes) for those that did not.

TABLE 16 Adherence analysis

	Adhered			Non-adhered			Adhered vs. non-adhered adjusted difference in means (95% CI)	*p*-value
Variable	*n*	Mean	SD	*n*	Mean	SD		
T2 MVPA weekday adherence	81	53.56	18.87	165	58.02	23.18	–3.264 (–8.53 to 2.00)	0.224
T2 MVPA weekend adherence	52	39.87	24.85	72	39.49	22.12	–2.404 (–10.86 to 6.05)	0.577
T1 MVPA weekday adherence	165	59.75	21.56	173	60.79	23.69	–1.700 (–7.06 to 3.66)	0.534
T1 MVPA weekend adherence	48	50.54	27.61	82	47.96	34.72	–2.885 (–15.76 to 9.99)	0.660

Index of Multiple Deprivation score

Table 17 shows the summary statistics for the Index of Multiple Deprivation (IMD) score by group. The intervention group had a lower median value of 13.75 (IQR 9.17–23.32) at T2 than the control group, who had a median value of 17.78 (IQR 9.50–35.35). The same trend is also reflected in the girls with T1 valid data. The *p*-values show a clear difference between the two groups at baseline in terms of IMD score. Adjusting for IMD score in the regression models does not change the main outcome (*Table 18*).

Additional exploratory analyses

Owing to the large number of girls not attending intervention sessions, further exploratory analyses were conducted examining the accelerometer-assessed levels of PA (sedentary, light, MVPA and accelerometer CPM) for those girls who attended dance sessions during T1 data collection. *Table 19* shows that in the period immediately after school (15.00–17.00), attendees had more minutes of MVPA (21.45 minutes) than in the same time frame on days on which they did not have a BGDP dance session (16.84 minutes). In addition, attendees had more minutes of MVPA between 15.00 and 22.00 than non-attendees (34.12 vs. 30.97 minutes) and more minutes of light activity (94.53 vs. 84.49 minutes) on dance days. A notable intervention effect ($p < 0.001$) was seen in the accelerometer CPM for girls attending the dance sessions on both dance (1116.04) and non-dance days (858.06) compared with non-attendees (844.15 and 784.85, respectively).

TABLE 17 Index of Multiple Deprivation score summary statistics by trial arm

	Control				Intervention				
Data	*n*	Median	IQR (25th quartile)	IQR (75th quartile)	*n*	Median	IQR (25th quartile)	IQR (75th quartile)	*p*-value[a]
All	287	17.99	9.81	35.35	282	15.68	9.29	23.91	0.002
Valid weekday T2	262	17.78	9.50	35.35	245	13.75	9.17	23.32	0.002
Valid weekday T1	265	18.09	9.50	35.35	255	13.75	9.20	23.91	0.002

a Rank-sum test.

TABLE 18 Primary and secondary outcomes (mean weekday minutes of MVPA at T2 and T1) regression output with and without IMD score in the model

Variable	Coefficient	SE	95% CI	*p*-value (Wald)
T2 (n = 508)				
Intervention arm (reference = control)	–1.516	1.65	–4.76 to 1.73	0.359
With IMD added to the model (n = 507)				
Intervention arm (reference = control)	–1.593	1.67	–4.87 to 1.68	0.341
T1 (n = 521)				
Intervention arm (reference = control)	–1.523	1.79	–5.03 to 1.98	0.395
With IMD added to the model (n = 520)				
Intervention arm (reference = control)	–1.579	1.81	–5.12 to 1.96	0.382

SE, standard error

TABLE 19 Mean (SD) for PA variables for intervention girls attending and not attending dance classes during measurement period between 15.00 and 17.00 and 15.00 and 22.00

PA variables	Weekday, mean (SD) (control, *n* = 280)	Attendees				Non-attendees			
		Dance day, mean (SD)	Non-dance day, mean (SD)	*t*[a]	*p*-value	Dance day, mean (SD)	Non-dance day, mean (SD)	*t*[a]	*p*-value
15.00–17.00		**n = *78***				**n = *137***			
Sedentary (minutes)	63.18 (14.07)	49.29 (14.01)	63.92 (21.91)	–5.92	< 0.001	59.92 (19.37)	60.94 (20.35)	–0.48	0.627
Light (minutes)	32.67 (8.94)	45.94 (9.87)	31.67 (12.77)	9.40	< 0.001	33.69 (11.00)	33.76 (13.59)	–0.60	0.952
MVPA (minutes)	15.78 (7.37)	21.45 (8.44)	16.84 (11.03)	5.14	< 0.001	15.80 (10.85)	14.00 (10.65)	1.71	0.088
CPM	825.19 (435.57)	1116.04 (360.78)	858.06 (547.25)	4.62	< 0.001	844.15 (503.33)	784.85 (467.51)	1.20	0.231
15.00–22.00		**n = *87***				**n = *137***			
Sedentary (minutes)	196.20 (65.36)	189.88 (65.60)	201.46 (77.30)	–1.32	0.191	177.30 (77.46)	188.75 (73.23)	–1.56	0.122
Light (minutes)	81.27 (28.69)	94.53 (28.47)	80.65 (38.10)	3.17	0.002	84.49 (37.41)	91.19 (40.66)	–1.99	0.048
MVPA (minutes)	29.16 (13.70)	34.12 (14.78)	29.31 (18.00)	2.74	0.008	30.97 (20.14)	30.49 (21.08)	0.25	0.807
CPM	724.96 (374.99)	779.31 (369.90)	679.44 (398.49)	2.05	0.044	766.89 (505.13)	745.88 (442.35)	0.44	0.664

a Paired sample *t*-test for within-subject differences on days on which girls should have been attending dance and non-dance weekdays.

Tables 20–22 show after-school engagement of all girls. At T0 little difference can be discerned between the different types of activities that intervention and control children participated in after school. *Table 21* examines the dance-specific engagement of all pupils at T1 and T2. Approximately 70% of all children did not take part in dance at both time points. The number of children in control schools who engaged in dance declined from 36.26% to 29.64% between T1 and T2, whereas the number of children engaged in dance increased in intervention schools from 30.47% to 33.69%. *Table 22* details the types of after-school activities that children had participated in during the past week.

TABLE 20 After-school activity engagement of girls at T0

After-school activity	Control		Intervention	
	n (taking part in activity)	% (of 287)	*n* (taking part in activity)	% (of 284)
Sports club	110	38.33	125	44.01
Activity	52	18.12	70	24.65
Playing on own	21	7.32	13	4.58
Sitting down	34	11.85	21	7.39
Total	217	75.61	229	80.63

TABLE 21 Engagement in dance activities at T1 and T2

	T1				T2			
	Control		Intervention		Control		Intervention	
Engagement	*n*	%	*n*	%	*n*	%	*n*	%
Engagement in dance activities								
No	181	63.73	195	69.53	197	70.36	185	66.31
Yes	103	36.26	86	30.47	83	29.64	94	33.69
Quantity (days)								
1	37	35.92	23	26.74	20	24.10	34	36.17
2	28	27.18	23	27.74	29	34.94	21	22.34
3	15	14.56	17	19.77	10	12.05	14	14.89
4	9	8.74	8	9.30	7	8.43	8	8.51
5+	14	13.59	14	16.28	17	20.48	16	17.02

TABLE 22 After-school (15.00–bedtime) activity engagement during the past week

		T1				T2			
		Control		Intervention		Control		Intervention	
After-school activity	Times per week	*n*	%	*n*	%	*n*	%	*n*	%
Sports clubs	Weekday								
	0 (days)	71	25.00	71	25.27	66	23.57	82	29.39
	1	55	19.37	42	14.95	66	23.57	59	21.15
	2	62	21.83	64	22.78	57	20.36	47	16.85
	3	41	14.44	35	12.46	39	13.93	36	12.90
	4	19	6.69	20	7.12	21	7.50	18	6.45
	5	36	12.68	49	17.44	31	11.07	37	13.26
	Weekend								
	0 (days)	114	40.14	108	38.43	108	38.57	117	41.94
	1	114	40.14	100	35.59	115	41.07	105	37.63
	2	53	18.66	72	25.62	57	20.36	57	20.43
	Missing	3	1.06	1	0.36	–	–	–	–

continued

TABLE 22 After-school (15.00–bedtime) activity engagement during the past week (*continued*)

After-school activity	Times per week	T1				T2			
		Control		Intervention		Control		Intervention	
		n	%	*n*	%	*n*	%	*n*	%
Activity clubs	Weekday								
	0 (days)	166	58.45	136	48.40	148	52.86	150	53.76
	1	57	20.07	62	22.06	58	20.71	57	20.43
	2	19	6.69	33	11.74	30	10.71	40	14.34
	3	12	4.23	16	5.69	17	6.07	12	4.30
	4	7	2.46	8	2.85	7	2.50	5	1.79
	5	23	8.10	26	9.25	20	7.14	15	5.38
	Weekend								
	0 (days)	204	71.83	178	63.35	181	64.64	192	68.82
	1	42	14.79	64	22.78	69	24.64	59	21.15
	2	34	11.97	35	12.46	30	10.71	28	10.04
	Missing	4	1.41	4	1.42	–	–	–	–
Playing on own or with friends	Weekday								
	0 (days)	11	3.87	22	7.83	22	7.86	20	7.17
	1	24	8.45	28	9.96	39	13.93	36	12.90
	2	50	17.61	53	18.86	55	19.64	53	19.00
	3	52	18.31	46	16.37	56	20.00	53	19.00
	4	55	19.37	35	12.46	45	16.07	49	17.56
	5	92	32.39	97	34.52	63	22.50	68	24.37
	Weekend								
	0 (days)	21	7.39	26	9.25	31	11.07	27	9.68
	1	86	30.28	82	29.18	109	38.93	105	37.63
	2	175	61.62	171	60.85	140	50.00	146	52.33
	Missing	2	0.70	2	0.71	–	–	1	0.36
Sitting-down activities	Weekday								
	0 (days)	9	3.17	20	7.12	10	3.57	21	7.53
	1	57	20.07	61	21.71	44	15.71	49	17.56
	2	68	23.94	72	25.62	71	25.36	57	20.43
	3	55	19.37	46	16.37	48	17.14	53	19.00
	4	29	10.21	21	7.47	37	13.21	33	11.83
	5	66	23.24	61	21.71	70	25.00	66	23.66
	Weekend								
	0	32	11.27	42	14.95	26	9.29	35	12.54
	1	152	53.52	138	49.11	134	47.86	125	44.80
	2	99	34.86	99	35.23	119	42.50	119	42.65
	Missing	1	0.35	2	0.71	1	0.36	–	–

Psychosocial data

In order to evaluate whether or not the variables derived from SDT mediated the effect of the intervention, motivation for dance and PA, perceived autonomy, competence and relatedness in PA, and self-esteem were analysed.

Cronbach's alpha

Cronbach's alpha was calculated at each time point for each psychosocial variable. Data are shown in *Table 23* and suggest that the scale scores have good internal consistency.

Correlation matrices

The correlations between psychosocial variables at each time point are shown in *Tables 24–26*. At each time point the cross-sectional correlations support the hypothesised associations between the SDT-based constructs. For example, autonomy, competence and relatedness need satisfaction were positively associated with autonomous motivation towards dance and PA and are largely negatively or unrelated to controlled motivation. In addition, the correlations support the expected positive associations between need satisfaction and autonomous motivation and self-esteem. Controlled motivation was negatively associated with self-esteem. These data provide initial evidence at the within-person level to support the theoretical model underpinning the BGDP intervention.

Regression analysis

The regression models examining differences in psychosocial variables at T1 and T2 are shown in *Table 27*. The results suggest that the intervention group has statistically lower scores for all of the psychological variables at T2 and T1 than the control group (except for 'autonomy need satisfaction' at T1 and T2, 'controlled motivation for dance' at T1 and 'self-esteem' at T2 which could all be consistent with chance).

Psychosocial complier average causal effect analysis

The regression models were then repeated using a CACE instrumental variable regression analysis.[84] The results for the psychosocial CACE analysis are presented in *Tables 28* and *29*. The results were not different from the initial regression analyses.

TABLE 23 Cronbach's alpha at each time point

Variable	T0	T1	T2
Autonomous motivation dance	0.71	0.83	0.86
Autonomous motivation PA	0.80	0.86	0.88
Controlled motivation dance	0.70	0.76	0.79
Controlled motivation PA	0.76	0.78	0.80
Autonomy need satisfaction	0.69	0.76	0.80
Competence need satisfaction	0.83	0.88	0.88
Relatedness need satisfaction	0.91	0.95	0.95
Self-esteem	0.81	0.83	0.84

TABLE 24 Correlation matrix for psychosocial variables at T0

Variable	Self-esteem	Relatedness	Competence	Autonomy	Controlled motivation PA	Autonomous motivation PA	Controlled motivation dance	Autonomous motivation dance
Self-esteem	1.000							
p-value								
Relatedness	0.445	1.000						
p-value	< 0.001							
Competence	0.610	0.503	1.000					
p-value	< 0.001	< 0.001						
Autonomy	0.445	0.522	0.551	1.000				
p-value	< 0.001	< 0.001	< 0.001					
Controlled motivation PA	–0.132	0.050	0.135	0.074	1.000			
p-value	0.002	0.235	0.001	0.075				
Autonomous motivation PA	0.373	0.420	0.554	0.539	0.324	1.000		
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001			
Controlled motivation dance	–0.149	0.029	0.117	–0.001	0.625	0.161	1.000	
p-value	< 0.001	0.497	0.005	0.989	< 0.001	< 0.001		
Autonomous motivation dance	0.305	0.338	0.398	0.360	0.246	0.548	0.341	1.000
p-value	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	

TABLE 25 Correlation matrix for psychosocial variables at T1

Variable	Self-esteem	Relatedness	Competence	Autonomy	Controlled motivation PA	Autonomous motivation PA	Controlled motivation dance	Autonomous motivation dance
Self-esteem	1.000							
p-value								
Relatedness	0.449	1.000						
p-value	< 0.001							
Competence	0.604	0.495	1.000					
p-value	< 0.001	< 0.001						
Autonomy	0.523	0.554	0.635	1.000				
p-value	< 0.001	< 0.001	< 0.001					
Controlled motivation PA	–0.144	0.076	0.180	0.040	1.000			
p-value	< 0.001	0.072	< 0.001	0.341				
Autonomous motivation PA	0.361	0.385	0.622	0.615	0.437	1.000		
p-value	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001			
Controlled motivation dance	–0.128	0.079	0.010	–0.072	0.607	0.203	1.000	
p-value	0.0020	0.062	0.018	0.089	< 0.001	< 0.001		
Autonomous motivation dance	0.262	0.308	0.423	0.384	0.314	0.616	0.399	1.000
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	

TABLE 26 Correlation matrix for psychosocial variables at T2

Variable	Self-esteem	Relatedness	Competence	Autonomy	Controlled motivation PA	Autonomous motivation PA	Controlled motivation dance	Autonomous motivation dance
Self-esteem	1.000							
p-value								
Relatedness	0.552	1.000						
p-value	< 0.001							
Competence	0.616	0.518	1.000					
p-value	< 0.001	< 0.001						
Autonomy	0.556	0.578	0.612	1.000				
p-value	< 0.001	< 0.001	< 0.001					
Controlled motivation PA	–0.216	–0.017	0.030	0.021	1.000			
p-value	< 0.001	0.696	0.473	0.629				
Autonomous motivation PA	0.426	0.415	0.562	0.625	0.404	1.000		
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001			
Controlled motivation dance	–0.110	–0.000	0.031	–0.011	0.692	0.226	1.000	
p-value	< 0.001	0.997	0.348	0.792	< 0.001	< 0.001		
Autonomous motivation dance	0.296	0.318	0.352	0.407	0.301	0.613	0.398	1.000
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	

TABLE 27 Psychosocial regression results for T1 and T2

Variable	Control			Intervention			Intervention vs. control adjusted difference in means (95% CI)[a]	*p*-value
	n	Mean	SD	*n*	Mean	SD		
T2								
Autonomous motivation for dance (0–4 scale)	280	3.59	0.84	279	3.33	0.92	–0.27 (–0.40 to –0.13)	< 0.001
Autonomous motivation PA (0–4 scale)	280	3.86	0.80	279	3.49	0.98	–0.34 (–0.48 to –0.21)	< 0.001
Controlled motivation dance (0–4 scale)	280	1.76	0.75	279	1.65	0.65	–0.11 (–0.22 to –0.01)	0.045
Controlled motivation PA (0–4 scale)	280	2.20	0.84	279	1.88	0.73	–0.29 (–0.42 to –0.18)	< 0.001
Autonomy need satisfaction (1–7 scale)	280	5.56	1.19	279	5.42	1.33	–0.12 (–0.32 to 0.07)	0.217
Competence need satisfaction (1–7 scale)	280	5.03	1.29	279	4.78	1.42	–0.22 (0.42 to –0.02)	0.027
Relatedness need satisfaction (1–7 scale)	280	5.92	1.41	279	5.53	1.62	–0.40 (–0.64 to –0.16)	0.001
Self-esteem (1–6 scale)	280	4.88	0.86	279	4.76	0.94	–0.12 (–0.26 to 0.10)	0.070
T1								
Autonomous motivation for dance (0–4 scale)	284	3.74	0.68	281	3.51	0.82	–0.23 (–0.35 to –0.12)	< 0.001
Autonomous motivation PA (0–4 scale)	284	3.91	0.73	281	3.65	0.90	–0.23 (–0.35 to –0.10)	< 0.001
Controlled motivation dance (0–4 scale)	284	1.75	0.68	281	1.70	0.65	–0.06 (–0.16 to 0.04)	0.262
Controlled motivation PA (0–4 scale)	284	2.16	0.77	281	2.01	0.77	–0.12 (–0.23 to –0.01)	0.041
Autonomy need satisfaction (1–7 scale)	284	5.61	1.06	281	5.43	1.28	–0.15 (–0.33 to 0.02)	0.091
Competence need satisfaction (1–7 scale)	284	5.17	1.32	281	4.84	1.43	–0.29 (–0.47 to –0.10)	0.003
Relatedness need satisfaction (1–7 scale)	284	5.82	1.43	281	5.41	1.69	0.42 (–0.66 to – 0.18)	0.001
Self-esteem (1–6 scale)	284	4.93	0.85	281	4.75	0.90	–0.19 (–0.32 to –0.06)	0.004

a For between-group differences the control group is the reference group with models adjusted for baseline value, local education authority, school size, school-level deprivation and school-level clustering.

TABLE 28 Psychosocial regression results T2, CACE analysis

Outcome	Variable	Coefficient	SE	Lower 95% CI	Upper 95% CI	*p*-value (Wald)	*n* (total)
Autonomous motivation dance	Intervention arm (reference = control)	–0.880	0.26	–1.39	–0.37	0.001	559
Autonomous motivation PA	Intervention arm	–1.139	0.27	–1.66	–0.62	< 0.001	559
Controlled motivation dance	Intervention arm	–0.367	0.19	–0.73	0.00	0.049	559
Controlled motivation PA	Intervention arm	–0.987	0.22	–1.42	–0.55	< 0.001	559
Autonomy need satisfaction	Intervention arm	–0.408	0.34	–1.06	0.25	0.223	559
Competence need satisfaction	Intervention arm	–0.738	0.35	–1.41	–0.06	0.033	559
Relatedness need satisfaction	Intervention arm	–1.329	0.43	–2.18	–0.48	0.002	559
Self-esteem	Intervention arm	–0.412	0.23	–0.87	0.05	0.079	559

SE, standard error.

TABLE 29 Psychosocial regression results T1, CACE analysis

Outcome	Variable	Coefficient	SE	Lower 95% CI	Upper 95% CI	*p*-value (Wald)	*n* (total)
Autonomous motivation dance	Intervention arm (reference = control)	–0.784	0.23	–1.23	–0.34	0.001	565
Autonomous motivation PA	Intervention arm	–0.750	0.22	–1.19	–0.31	0.001	565
Controlled motivation dance	Intervention arm	–0.193	0.17	–0.53	0.15	0.264	565
Controlled motivation PA	Intervention arm	–0.397	0.19	–0.78	–0.02	0.041	565
Autonomy need satisfaction	Intervention arm	–0.509	0.31	–1.11	0.09	0.096	565
Competence need satisfaction	Intervention arm	–0.953	0.33	–1.61	–0.30	0.004	565
Relatedness need satisfaction	Intervention arm	–1.399	0.43	–2.25	–0.55	0.001	565
Self-esteem	Intervention arm	–0.635	0.23	–1.09	–0.18	0.006	565

SE, standard error.

Summary of quantitative results

The main analysis provided no evidence that the BGDP had any effect on accelerometer-derived PA levels of Year 7 girls, during the intervention and post-intervention periods. One-third of girls in the intervention arm met the adherence criteria of two-thirds of sessions delivered in schools. When the data were reanalysed using a CACE per-protocol analysis, the models provided no evidence of difference in weekday MVPA during and post intervention. Further exploratory analyses indicated that intervention group girls attending dance classes during the measurement period achieved more minutes of MVPA, more minutes of light-intensity PA and more accelerometer CPM between 15.00 and 17.00 on dance days versus non-dance days. Therefore, data show that any impact was relatively small and is weakened after considering data from non-dance days. An analysis of the psychosocial variables suggested that autonomous motivation towards both dance and PA decreased in the intervention group compared with the control group at T1 and T2. Although there was strong evidence against the null for these differences, the magnitude of the differences was relatively small when interpreted using the scale of measurement. Similarly, although change in autonomy need satisfaction did not differ between intervention and control groups from T0 to T2, perceptions of competence and relatedness need satisfaction showed small decreases in intervention arm girls compared with control arm girls at T1 and T2. The results were similar when the data were reanalysed using a CACE model.

Chapter 4 Economic evaluation

Aims and perspective

This chapter describes the methodology and results of an economic evaluation of the BGDP. The economic evaluation was conducted from a public-sector perspective and included costs to local authorities and to the NHS.

The aims of the economic component of the project were:

- to determine and categorise the resources used and monetary value of cost inputs in training, preparation and delivery of the BGDP programme
- to determine the cost-effectiveness of the BGDP programme compared with no active intervention
- to determine the cost–utility of the BGDP programme compared with no active intervention.

This short-term analysis estimates the cost-effectiveness and cost–utility of the intervention compared with no active intervention over the 1-year period of the trial. For these analyses it was assumed that there were no differences in costs or intervention effects between the intervention and control group beyond the 1-year follow-up period.

Methods

Costing methods

Data on resource use and actual costs incurred by dance instructors were collected by the project team and recorded using the resource use checklist developed during the BGDP feasibility study.[62] Actual costs incurred (e.g. dance instructor travel, time) were used to estimate dance instructor training and programme delivery costs. Prices were taken from actual costs on time sheets, published and established sources. Dance instructors were paid £40 per BGDP session, with each session lasting for 1.25 hours. Dance instructors were entitled to claim up to £10 travel expenses per session. Costs were categorised as one-off training costs, recurrent programme preparation costs, recurrent programme delivery costs, and were stratified by school. Recruitment and marketing costs (e.g. taster session dance instructor delivery and travel costs, school and pupil recruitment printing and travel costs) were identified separately because they depend upon the implementation context for participation in each school setting.[85] These costs might have differential timing at initiation of mainstream delivery and/or may not always apply in practice.[86] An average cost per school was estimated from the mean public-sector costs of the programme for each school. To estimate the average cost per girl within each school, the average cost per school was divided by the maximum number of girls recruited from each school ($n = 33$).

Sensitivity analysis

State secondary schools in Bristol, North Somerset and Bath, and North East Somerset participated in the study. In some cases, participating schools were located some distance apart. This may have resulted in dance instructors having to travel further than they would normally, resulting in higher travel expenses than could be achieved in other settings. Costs were therefore recalculated to exclude travel expenses on the assumption that local dance instructors could be hired.

Cost-effectiveness methods

Accelerometer data collected at baseline, T1 and T2 were used to estimate the average cost per minute of MVPA at T2 (and T1). An incremental cost-effectiveness ratio (ICER) was calculated by dividing the average cost per girl by the difference in average weekly minutes of MVPA at T2 (and T1) in the intervention and control arms. Average weekly minutes of MVPA were calculated using multivariable mixed-effects linear regression, adjusting for average MVPA at baseline, local education authority (LEA), percentage deprivation at school level, school size and school-level MVPA.

To estimate the average cost per girl meeting the 60-minute per day MVPA recommendation at T2 (and T1), an ICER was calculated by dividing the average cost per girl by the difference in the proportion of girls meeting the 60-minute per day MVPA recommendation in the intervention and control arms at T2 (and T1). These proportions were calculated using multivariable mixed-effects linear regression, adjusting for average MVPA at baseline, LEA, percentage deprivation at school level, school size and school-level MVPA.

Discounting of costs and outcomes was not required for the 1-year trial period. To account for uncertainty in incremental cost estimates, incremental costs and cost-effectiveness were explored using bootstrapping procedures (10,000 iterations). Analyses were conducted in SPSS (Statistical Product and Service Solutions) version 20 (SPSS Inc., Chicago, IL, USA).

Cost–utility methods

The EQ-5D-Y, recently validated for use with children and adolescents, was applied as a secondary outcome measure of health-related quality of life.[75] It consists of two sections: the descriptive system (EQ-5D-Y descriptive) and the visual analogue scale [VAS (EQ VAS)]. For the descriptive system, girls were asked to complete items on five dimensions of health (mobility, self-care, everyday activities, pain/discomfort and happiness/worry/sadness) at baseline, T1 and T2. Each dimension has three levels: 'no problems', 'some problems' and 'a lot of problems', thus defining 243 possible health states. For the EQ VAS, girls were asked to rate their health on a VAS ranging from 'The best health you can imagine' to 'The worst health you can imagine'. EQ-5D-Y descriptive responses were initially converted into unique health states and then weighted according to UK Population Norms for EQ-5D (based on UK Measuring and Valuing Health survey[87]) to create utility values ranging from 0.0 (dead) to 1.0 (perfect health). To estimate quality-adjusted life-years (QALYs) gained, the change in intervention group utility values was multiplied by the duration of the intervention effect. An area under the curve (AUC) approach was applied to median utility values to calculate the cost per QALY of BGDP as a PA intervention.

Results

Costs

The costs in *Table 30* have been calculated for a representative year (2013–14). Assessment of the resources used and monetary value of cost inputs in training, preparation and delivery revealed that BGDP cost £21,613 across nine schools, with an average cost per school of £2401 and a variation in cost of £104. The average cost per pupil was £73 with a range of £68–77, which was mainly attributable to differences in the total number of girls recruited to the study at study initiation.

The BGDP involved 497 hours of dance instructor input, a figure which equated to almost 80% of total indicative costs. Other substantial contributors to total indicative cost included dance instructor travel expenses at a cost of £2998 and printing materials for programme delivery at a cost of £2013 based on 2013–14 prices.

Sensitivity analysis

A sensitivity analysis demonstrated that the average cost per girl was reduced to £63 when dance instructor travel expenses were excluded.

TABLE 30 Bristol Girls Dance Project resources and costs (2013–14)

Category and description of resources	Unit cost (£)	Number of units	Total cost (£)	Mean (SD) cost (£) per school ($n = 9$)
Recruitment and marketing costs[a]			6573	730
One-off training resources				
Lead dance instructor delivery of dance instructor induction training			297	33
Dance instructor induction training	32/hour	32 hours	1024	114 (64)
Travel expenses for induction training[b]			40	4 (6)
Lead dance instructor delivery of dance instructor booster training			180	20
Dance instructor booster training	32/hour	26 hours	832	92 (43)
Travel expenses for booster training[b]			43	5 (6)
Recurrent programme preparation resources				
Printing: training guide	3.20/guide	12 guides	38	4
Printing: dance instructor guide	15.90/guide	12 guides	191	21
Recurrent programme delivery resources				
Programme delivery[c]	32/hour	439 hours	14,040	1560 (53)
Travel expenses for programme delivery[b]			2915	324 (130)
Printing materials for programme delivery[d]			2013	224
Indicative total cost[e]			21,613	2401 (104)
Indicative total costs (excluding one-off training)			19,197	2133 (139)
Total cost per girl (95% CI)[f]			73 (71 to 75)	

a Excluded from indicative total cost.
b Dance instructors could claim up to £10 travel expenses per session. Average travel expenses claimed for induction training, booster training and programme delivery = £333 (SD £136).
c Dance instructors were paid £32.00 per hour (each dance session was 1.25 hours in duration). Sessions claimed ranged from 2–71 sessions, average sessions claimed 34 (SD 19). Additional programme delivery expenses were claimed by dance instructors if they had provided cover for another dance instructor during programme delivery.
d Registers, dance diaries, spring half-term reminder cards, Easter reminder cards, summer half-term reminder cards, post-intervention dance booklets.
e Mainstream implementation of the programme would not include recruitment and marketing costs which were, therefore, excluded from the indicative total cost of BGDP.
f Average cost per school/maximum number of girls recruited from each school ($n = 33$).

Cost-effectiveness

At T2, girls in the control group had 1.52 minutes more weekday MVPA than the intervention group when all other covariates in the model were fixed, including adjusting for baseline weekday MVPA. As shown in *Table 31,* the BGDP intervention was dominated by the control as it was more effective and cost less to produce an additional minute of weekday MVPA (ICER –£48, 95% CI –£49 to –£47). Results were broadly similar at T1 (*Table 32*).

The proportion of girls in the intervention group meeting the 60-minute per day MVPA recommendation at T2 was slightly higher than the proportion in the control group (39.02% vs. 32.44%) when all other covariates in the model were fixed, including adjusting for the value at baseline. As shown in *Table 33*, the BGDP intervention was dominated by the control, as the control was more effective and cost less to produce an additional unit of effect (ICER –£61, 95% CI –£62 to –£60). Results were broadly similar at T1 (*Table 34*).

TABLE 31 Cost per minute of MVPA at T2

Variable	Control			Intervention		
	n	Mean	SD	*n*	Mean	SD
Weekly minutes of MVPA[a]	262	53.15	19.61	246	56.55	21.92
Difference between intervention and control, £ (95% CI)	–1.52 (–4.76 to 1.73)					
Intervention cost per girl, £ (95% CI)	73 (71 to 75)					
ICER, £ (95% CI)	–48 (–49 to –47)					

a Weekly minutes adjusted for average MVPA at baseline, LEA, percentage deprivation at school level, school size and school-level MVPA.

TABLE 32 Cost per minute of MVPA at T1

Variable	Control			Intervention		
	n	Mean	SD	*n*	Mean	SD
Weekly minutes of MVPA[a]	256	57.69	19.39	256	60.46	22.98
Difference between intervention and control, £ (95% CI)	–1.52 (–5.03 to 1.98)					
Intervention cost per girl, £ (95% CI)	73 (71 to 75)					
ICER, £ (95% CI)	–48 (–49 to –46)					

a Weekly minutes adjusted for average MVPA at baseline, LEA, percentage deprivation at school level, school size and school-level MVPA.

TABLE 33 Cost per girl meeting the 60-minute per day MVPA recommendation at T2

Variable	Control	Intervention
Proportion of girls meeting 60-minute per day recommendation (%)[a]	32.44	39.02
Difference between intervention and control, £ (95% CI)	–1.18 (1.68 to 0.73)	
Intervention cost per girl, £ (95% CI)	73 (71 to 75)	
ICER, £ (95% CI)	–61 (–62 to –60)	

a Proportion of girls meeting the 60-minute per day MVPA recommendation adjusted for average MVPA at baseline, LEA, percentage deprivation at school level, school size and school-level MVPA.

TABLE 34 Cost per girl meeting the 60-minute per day MVPA recommendation at T1

Variable	Control	Intervention
Proportion of girls meeting 60-minute per day recommendation (%)[a]	41.89	47.27
Difference between intervention and control, £ (95% CI)	–1.11 (1.68 to 0.73)	
Intervention cost per girl, £ (95% CI)	73 (71 to 75)	
ICER, £ (95% CI)	–65 (–68 to –64)	

a Proportion of girls meeting the 60 minutes per day MVPA recommendation adjusted for average MVPA at baseline, LEA, percentage deprivation at school level, school size and school-level MVPA.

Cost–utility

European Quality of Life-5 Dimensions Youth survey scores were comparable across intervention and control groups for each dimension (mobility, self-care, everyday activities, pain/discomfort and happiness/worry/sadness) at each time point. As expected when administering the EQ-5D-Y to members of the general 'healthy' population, only a small number of girls reported 'a lot of problems' for any dimension of the EQ-5D-Y. The three original categories were, therefore, dichotomised into 'no problems' and 'problems' to present the frequencies of reported problems. Baseline frequency distributions were compared among intervention and control group responses and a statistical assessment of differences was performed using a chi-squared test of association (*Table 35*). Fisher's exact probability test was used to overcome the violation of minimum cell frequency, where appropriate. Tests revealed no evidence for a difference in the frequency of reported problems at baseline among girls in the intervention and control groups.

Tables 36 and *37* detail the mean utility scores associated with the BGDP and no active intervention at each time point (baseline, T1 and T2). EQ-5D-Y-derived utility values and VAS scores were found to be correlated. Median EQ-5D-Y-derived utility values and VAS scores were used in analysis because data were found to be negatively skewed. Mann–Whitney *U*-tests revealed no evidence for differences in median EQ-5D-Y utility

TABLE 35 Frequency (%) of reported problems by dimension and intervention arm at baseline

	No problems		Problems		
EQ-5D-Y dimension	*n*	%	*n*	%	*p*-value[a]
Mobility					
Intervention	268	94.37	16	5.63	0.497
Control	266	92.68	21	7.32	
Total	534	93.52	37	6.48	
Looking after myself					
Intervention	282	99.30	2	0.70	0.686
Control	283	98.61	4	1.39	
Total	565	98.95	6	1.05	
Doing usual activities					
Intervention	268	94.37	16	5.63	0.606
Control	267	93.03	20	6.97	
Total	535	93.70	36	6.30	
Having pain or discomfort					
Intervention	212	74.65	72	25.35	0.636
Control	209	72.82	78	27.18	
Total	421	73.73	150	26.27	
Feeling worried, sad or unhappy					
Intervention	245	86.27	39	13.73	0.555
Control	242	84.32	45	15.68	
Total	487	85.29	84	14.71	

a Chi-squared test of association.

TABLE 36 Health outcomes measured in BGDP: responses to the EQ-5D-Y descriptive system

Outcomes[a]	*n*	Mean	SD	Median	IQR (25th quartile)	IQR (75th quartile)	*p*-value[b]
Baseline							
Intervention	278	0.92	0.12	1.00	0.80	1.00	0.309
Control	279	0.91	0.16	1.00	0.80	1.00	
Total	557	0.91	0.14	1.00	0.80	1.00	
T1							
Intervention	278	0.89	0.17	1.00	0.80	1.00	0.667
Control	279	0.89	0.18	1.00	0.80	1.00	
Total	557	0.89	0.17	1.00	0.80	1.00	
T2							
Intervention	278	0.91	0.17	1.00	0.80	1.00	0.382
Control	279	0.91	0.14	1.00	0.80	1.00	
Total	557	0.91	0.15	1.00	0.80	1.00	

a EQ-5D-Y scores range from 0.00 (dead) to 1.00 (perfect health). Notably, some health states are regarded as being worse than death and have negative values.
b Rank-sum between groups.

TABLE 37 Health outcomes measured in BGDP: responses to the EQ-5D-Y VAS

Outcomes[a]	*n*	Mean	SD	Median	IQR (25th quartile)	IQR (75th quartile)	*p*-value[b]
Baseline							
Intervention	278	79.70	16.88	84.50	70.00	95.00	0.827
Control	279	79.15	17.50	80.00	68.00	95.00	
Total	557	79.42	17.18	81.00	70.00	95.00	
T1							
Intervention	278	78.76	16.84	80.00	70.00	90.00	0.794
Control	279	79.16	16.86	83.00	70.00	90.00	
Total	557	78.96	16.83	80.00	70.00	90.00	
T2							
Intervention	278	78.63	17.63	80.50	70.00	91.00	0.554
Control	279	78.35	16.39	80.00	70.00	90.00	
Total	557	78.49	17.00	80.00	70.00	90.00	

a EQ-5D-Y VAS scores range from 0 (the worst health you can imagine) to 100 (the best health you can imagine).
b Rank-sum between groups.

values or VAS scores according to trial arm at baseline, T1 and T2. The AUC method was used to determine the cost–utility for each girl over the trial period. The analysis controlled for baseline utility scores between the intervention and control groups. An AUC approach revealed no difference in the QALYs for the intervention and control groups (1 QALY), resulting in no QALYs gained by the intervention.

Summary

The BGDP was inexpensive to deliver, costing an additional £73 per girl compared with no active intervention over the 1-year period of the trial. It is important to note that the £73 cost per child may underestimate the true cost per girl, as it is based on all children who signed up in a given school actually attending. However, as demonstrated in the attendance data, many children in study schools did not attend sessions, so the cost per attendee is higher. The additional cost per school was relatively consistent, ranging from £2257 to £2551. There was no evidence to suggest that the BGDP was effective at increasing MVPA. Self-reported health-related quality-of-life measures were also similar between the intervention and control groups at T2. Therefore, owing to a lack of effectiveness, the intervention, despite its low cost, was not cost-effective.

This study provides information on resources used and monetary value of cost inputs in training, preparation and delivery of the BGDP programme. These findings will be relevant to commissioners who have limited resources to improve the health of children in schools and who need to know whether or not investments in after-school PA programmes are affordable within a set budget.[88] Findings reveal that the BGDP is of comparable cost to other school-based PA interventions.[89] This study demonstrates that collating full cost data via a resource use checklist is feasible and practical, and can produce an accurate estimate of mainstream costs.

It is important to highlight that the data presented in this study indicate that the EQ-5D-Y was unresponsive to changes in a 'healthy' school population, with no differences identified between the intervention and control groups. In addition, health utility values were generated from adult UK population norms for EQ-5D,[87] as child values were unavailable at the time. Future research should consider alternative health-related quality-of-life measures, which are appropriate to the population under investigation, which is young and healthy.

Chapter 5 Process evaluation overview

Qualitative sample characteristics

A total of 59 girls took part in the focus groups (*Table 38*) and group sizes ranged from three to eight girls. Girls in the highest attendance third were more likely to agree to participate in a focus group. Participation in one school was low ($n = 3$) which, in part, may be due to the interview being organised (by the school contact) at an unappealing time of day (after school). A total of 10 dance instructors were interviewed, including one reserve instructor, two instructors who each delivered half of the intervention in one school and one dance instructor who taught in two schools. One school contact was interviewed in each of the intervention schools.

Process evaluation findings

Chapters 6–8 reflect on key findings from the process evaluation. *Chapter 6* addresses the implementation and impact of the intervention on the stakeholders. *Chapter 7* focuses on the theoretical fidelity within the intervention. In particular, it looks at dance instructors' experiences of delivering a theory-based intervention and girls' perceptions on delivery styles and impact on their psychological needs of autonomy, competence and relatedness. *Chapter 8* provides a summary of the challenges of and lessons learnt through conducting an extracurricular PA intervention. The main aim of *Chapter 8* is to identify key areas of improvement in order to facilitate successful delivery of such future interventions. Collectively, these chapters provide a comprehensive overview of the process evaluation data collected.

TABLE 38 Focus group sample size

	Levels of attendance , *n*			
School	Low	Medium	High	Total, *n*
21	3	2	3	8
23	3	1	3	7
32	2	3	3	8
42	3	2	3	8
51	1	1	1	3
53	1	1	3	5
61	1	2	3	6
62	2	1	3	6
72	2	3	3	8
Total, *n*	18	16	25	59

Chapter 6 Process evaluation: main findings

Process evaluations are key to understanding what effects an intervention's delivery. A thorough process evaluation of the BGDP was conducted while the intervention was being delivered. We adopted quantitative and qualitative methods to develop a deep insight into the delivery and receipt of the intervention in schools. This section examines the underlying processes of the intervention, taking into consideration dose and fidelity, processes through which change occurred and the contexts in which the intervention was delivered. This chapter also describes how the intervention was received from the perspectives of a variety of stakeholders (girls, dance instructors and school contacts). The qualitative information elicited from these stakeholders provides greater insight and helps to interpret the quantitative data. The quotations have been anonymised and are presented with the school identification (ID) alongside informant group (i.e. dance instructor 21, focus group 42).

Implementation

This section reports on the intervention dose, compliance adherence, dance instructor training and the degree to which instructors adhered to the session-plan manual. The section provides an overview of the extent to which the intervention was implemented in line with the initial design and guiding materials.

Dose

Four schools delivered the maximum of 40 dance sessions (range of sessions 37–40). The average number of girls signed up to the study in each school was 31.56 (range 26–33). The average proportion of girls attending two-thirds of all possible dance sessions was 9.10 per school (range 1–20).

Compliance adherence

Figure 5 displays the attendance by school over the 40 sessions. The mean number of girls per session across all intervention schools was 12.84 girls (SD 6.96 girls) (maximum 32 girls). Mean attendance at the first session was 24.33 girls (SD 5.50 girls), this decreased to 10.25 girls (SD 7.59 girls) by the final session. Sessions ($n = 12$) in which fewer than two girls attended are explained in general by a school event or communication breakdown between instructor and school; in some cases, reasons were not given. There is considerable variation within and between schools, with attendance fluctuating throughout the intervention period. Low attendance in School 53 [mean 6.41 girls (SD 3.39 girls)] can partly be explained by the high number of girls who never attended a dance session ($n = 13$).

Table 39 shows additional attendance data. Percentage attendance across all sessions ranged from 20.85% in School 21 to 64.94% in School 23. Percentage attendance is slightly higher when calculated as a product of girls who attended one of the first four sessions, particularly in School 53, where average attendance increased from 22.89% to 37.71%; however, overall average attendance across all schools increases to only 44.50%.

Although the attendance levels may seem concerning, the qualitative data suggest that a decline in attendance is to be expected in after-school activities. School contacts and dance instructors generally viewed the attrition as similar to other after-school clubs.

> *We tend to have a lot of very high numbers to start with. So for example, when we start netball club in Year 7 we might have 50, 60 girls come into netball club and then the drop off, it goes down to about 30 by the end.*
>
> *School contact 23*

> *My numbers dropped which is to be expected in summer term.*
>
> *Dance instructor 42*

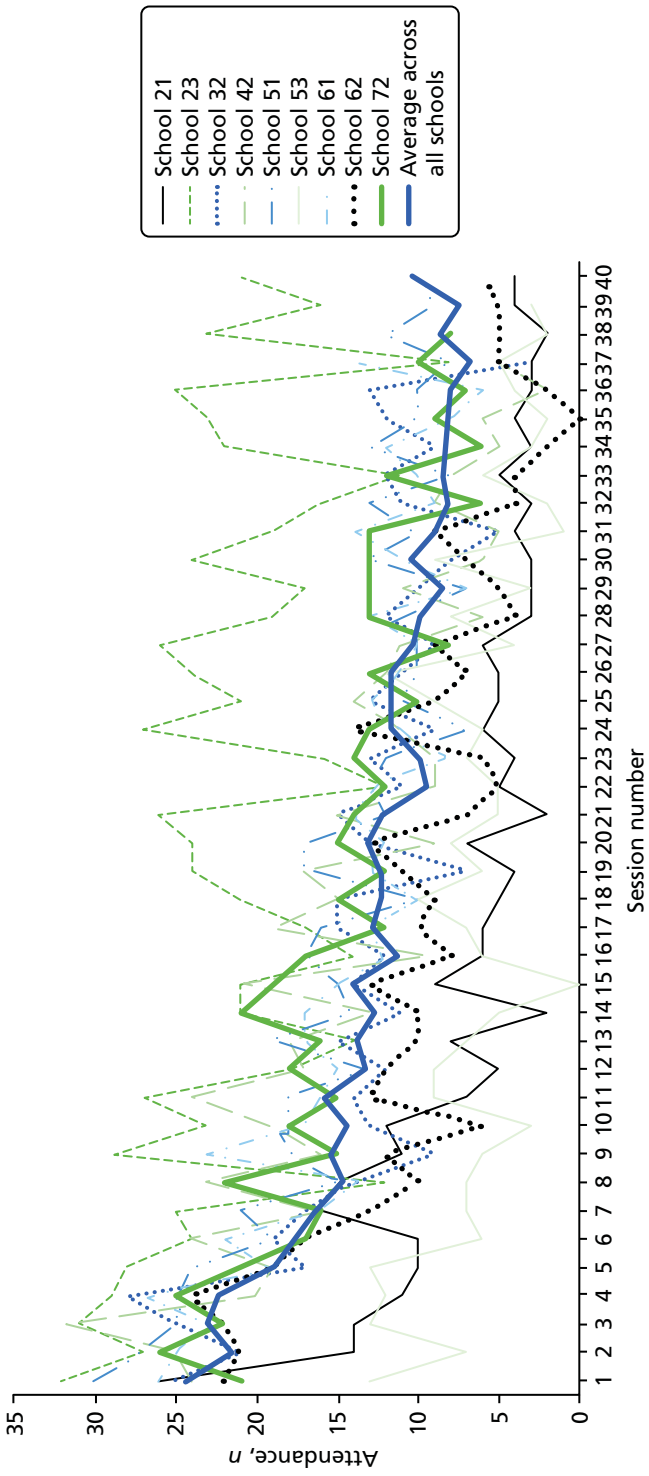

FIGURE 5 Attendance per dance session across all schools.

TABLE 39 Additional attendance data

School ID	Number of sessions completed	Number of girls at sign-up	Average attendance over all sessions, mean (SD)	Average attendance over all sessions (%)	Attendance relative to those attending one of the first four sessions (%)	Number of girls who never attended	Number withdrawn from dance sessions
21	40	33	6.88 (4.94)	20.85	24.55	6	3
23	40	33	21.43 (5.76)	64.94	64.92	0	0
32	37	33	13.30 (5.22)	40.30	45.85	4	1
42	37	33	14.16 (7.07)	42.91	44.26	1	1
51	40	32	14.68 (5.71)	45.88	45.86	0	0
53	39	28	6.41 (3.39)	22.89	37.71	13	1
61	37	33	14.51 (5.29)	43.97	50.05	3	8
62	40	26	9.75 (5.86)	37.50	39.00	6	3
72	38	33	14.66 (5.04)	44.42	48.86	2	6
Average	39	32	12.84	39.90	44.50	4	3
Total	348	284	–	–	–	35	23

Dashes indicate that no data are available.

> *When you start a new project you quite often might get loads of people and then you [. . .] whittle it down to your core people I guess, which I guess can be quite usual.*
>
> *Dance instructor 23*

However, two school contacts suggested that the attendance decline was notably high.

> *You've always got all the enthusiasm at the start and then 'Oh, I'm bored now'. Naturally, but not by the amount that it did [in Active7]. That's quite unusual.*
>
> *School contact 21*

> *It did drop off . . . you know the number of girls not coming . . . we'd have to sort of talk to them about [. . .] I was quite surprised in a way that, it was . . . that numbers did drop down.*
>
> *School contact 51*

The high attendance in School 23 (see *Figure 5*) was cited as being a result of the 'novelty' of the study.

> *We haven't really had something like this, like Active7. That's why loads of people started attending.*
>
> *Focus group 23*

One dance instructor thought that these girls valued their place on the project.

> *I felt like they wanted to stay in the project but they also understood that this was exclusive to them [. . .] so I think they really valued their place in the class.*
>
> *Dance instructor 23*

The school contact in School 23 attributed the high attendance (along with attitudes and behaviour) to the relatively high socioeconomic position of girls' families.

> *The type of students we've got in this school . . . they don't want to let people down so I think they've got that in the back of their minds. They are aware that it's a good opportunity for them, and they've got parental support so I think that's a major impact.*
>
> *School contact 23*

> *I think it's just because the school's in a good area that the students are more behaved . . . well behaved, got better attendance compared to an area like, I don't know, maybe [area] or something like that.*
>
> *Dance Instructor 23*

The inclusive rather than exclusive attendance policy of the BGDP allowed girls to return if they missed sessions. This may have encouraged girls to return to the club after an absence.

> *Active7 is very different to a normal group and when you're working towards a performance and you haven't been there for eight weeks it's usually you'd just be like 'no'. So I think that openness is really nice.*
>
> *Dance instructor 32*

Absences followed by reattendance was sometimes difficult because the instructor was perceived to be annoyed with girls for missing sessions. However, some thought that this was justifiable and found it easy to catch up.

> *Going back to like pressure, she always used to get a bit cross if we weren't there for a few weeks.*
>
> *Focus group 32*

> *She was strict because she wanted you to be dedicated and turn up.*
>
> *Focus group 53*

> Int: *But you did find it okay to come back?*
>
> Girl 1: *Yeah.*
>
> Girl 2: *I learnt the dance really quickly anyway when I came back.*
>
> *Focus group 53*

Factors that influenced attendance

Figure 6 shows the reasons why girls did not attend sessions. The most common reason that girls cited (in the questionnaire completed at follow-up) was 'I did something else on the days Active7 was run'. Another often-cited reason for not attending was 'When I signed up I thought it would be different'.

The qualitative data suggest that attendance was influenced by girls' commitment to the project, events outside of Active7, friendship groups and the design of the intervention. Dance instructors felt that attendance reflected the girls' level of commitment.

> *It dropped down to those that really were committed.*
>
> *Dance instructor 21*

> *They got the impression that once you committed to the project that you have to stick with it.*
>
> *Dance instructor 23*

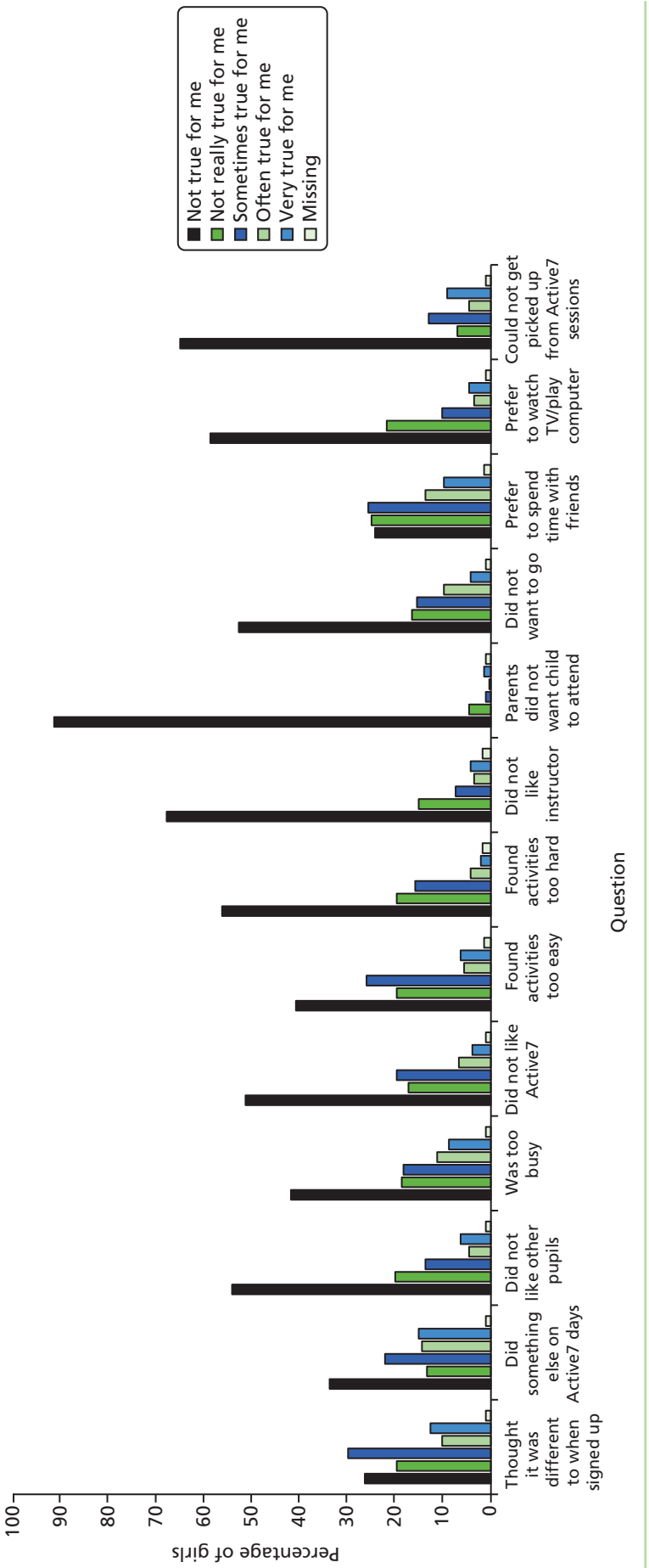

FIGURE 6 Self-reported reasons for not attending Active7 sessions. TV, television.

> *There's lots of other groups going on at the school and when the weather was nice, or if it was a friend's birthday or anything like that, it meant that the attendance was all over the place.*
>
> *Dance instructor 32*

All participant groups discussed how competing priorities outside Active7 affected attendance.

> *We sometimes had sports matches or something, so we couldn't go.*
>
> *Focus group 23*

> *A lot of the students might be doing other things in the week and things like that it was a big commitment.*
>
> *School contact 51*

> *They're not used to kind of having to do so much stuff after school and there's obviously lots of other things that are offered to them in secondary school.*
>
> *School contact 53*

Friendship groups within Active7 affected attendance levels in both positive and negative ways. Some girls went because their friends attended, whereas if a friend dropped out, this could negatively impact attendance.

> *Not sure whether they were really [. . .] interested in dance. They'd come every week because they're part of the gang.*
>
> *Dance instructor 42*

> *There were times I know when they would walk home together and so if one decided that they didn't want to do the session then I might lose like four.*
>
> *Dance instructor 62*

> *So like when you're doing stuff out of school and with like you're friends and that and then you can't go because you have to go to Active7.*
>
> *Focus group 61*

Various elements of the intervention may also have contributed to the declining attendance. This is discussed at length in *Chapter 8, Project design*, however, a brief summary is provided here. Supporting the qualitative evidence, the days on which Active7 was scheduled, specifically Fridays, was a factor that negatively affected attendance.

> *We finish early on Fridays as well so it's just like there's no point in finishing earlier [. . .] That was one of the main reasons why I kind of like left.*
>
> *Focus group 51*

Some school contacts and dance instructors suggested that the length of the project and the quantity of sessions per week had a negative effect on commitment.

> *They don't normally last 20 weeks or whatever, whether that was just too much for them.*
>
> *School contact 51*

> *The two sessions a week, I think it perhaps was too much because it was [. . .] a big commitment.*
>
> *School contact 42*

I've said about changing to one session a week [yeah]. I think that . . . yeah, I think the commitment . . . they did brilliantly to commit but I think as they get older that commitment is – if it was to stay with two sessions a week – it would definitely, um [yeah], definitely dwindle away and float off I think.

Dance instructor 23

However, feelings were mixed for girls. Some felt that two sessions helped them to remember dance material and keep them fit, whereas others thought that it got boring.

[Two sessions per week] gives us chance to remember things [. . .] it gives us more chance to practice.

Focus group 23

It almost because like a chore to some people.

Focus group 72

Withdrawal from sessions

Table 40 presents the number of girls in intervention schools withdrawing from the study, by school. Pre-intervention withdrawal relates to those girls who did not attend any sessions. Only three schools had no pre-intervention withdrawals. Three schools had pre-intervention withdrawal in excess of 10% of pupils signed up, with School 53 seeing almost 30% of girls not attend any sessions. During-intervention withdrawal refers to girls who stopped attending Active7 sessions, and complete withdrawal refers to the number of girls who withdrew from the study completely (including data collection). Similar to pre-intervention withdrawal, during-intervention withdrawal was highest in schools 21 and 53, with > 36% and 48% of girls in these schools, respectively, withdrawing at some point.

Impact of attendance levels on intervention delivery

Some dance instructors were frustrated and disappointed by the decrease in attendance.

It was quite depressing to write down and see it, how many people didn't want to come.

Dance instructor 23

You can take that [poor attendance] really personally, which you shouldn't do. But yeah it's definitely interesting to hear that it wasn't just me.

Dance instructor 32

TABLE 40 Withdrawal rates in intervention schools

School ID (*n* pupils at T0)	Pre-intervention withdrawal: attended no sessions, *n* (% of total sign-up in school)	During-intervention withdrawal, *n* (% after attending at least one session)	Complete withdrawal, *n* (%)
21 (33)	6 (18.18)	5 (18.52)	0 (0.00)
23 (33)	0 (0.00)	0 (0.00)	2 (6.06)
32 (33)	4 (12.12)	0 (0.00)	1 (3.03)
42 (33)	0 (0.00)	1 (3.03)	0 (0.00)
51 (32)	0 (0.00)	4 (12.50)	0 (0.00)
53 (28)	8 (28.57)	4 (20.00)	1 (3.57)
61 (33)	3 (9.09)	1 (3.33)	0 (0.00)
62 (26)	1 (3.85)	0 (0.00)	1 (3.85)
72 (33)	3 (9.09)	2 (6.67)	0 (0.00)
Overall (284)	25 (8.80)	17 (6.56)	5 (0.70)

I haven't really experienced that [low attendance] before . . . in the other places that I've taught it all remains, you know, on a higher level, so I was like 'mm, am I doing something wrong?'.

Dance instructor 62

Poor attendance resulted in the repetition of previous session content, a method used to allow absent girls to keep up with the progressive building of dance pieces. However, dance instructors found this challenging, particularly as it prevented them from moving forwards.

You're getting different people every time and that's a real juggling act because if they want to make their own material they have to make something new every session.

Dance instructor 23

From my point of view it disrupts the class a lot because it means I have to always go back to the beginning of the choreography to make them feel included [. . .] it creates a bit of boredom for the others.

Dance instructor 23

You can't really progress to another section of a dance really if everyone doesn't know it.

Dance instructor 62

As attendance declined, however, smaller groups of 'committed' girls were preferred by the instructor and those attending. This also made teaching easier and facilitated the formation of closer instructor–participant connections.

As the numbers decreased, although it was heart-breaking sometimes, it was so much easier to teach.

Dance instructor 21

The girls said on a number of occasions 'I love the group like this, like much smaller'.

Dance instructor 32

I don't really know if like you can do this . . . but like less people because now there's not that many people there it's so much more relaxed and like everyone can just be themselves and everything. When there's like loads of new people you don't want to like stand out or anything. If you could do Active7 with less people.

Focus group 61

Good attendance in one school gave the instructor a confidence boost and was experienced as reassuring because she had taken over from another instructor and felt that there was a risk that girls might stop attending during this period of transition.

When the sessions started from my point onwards, the attendance, in my opinion, stayed really, really good and quite consistent.

Dance instructor 23

Reaching those who needed the intervention most

The intervention was perceived to 'reach' some girls who had previously not had opportunities such as BGDP. Perceived as those 'in need', these girls were typically considered to have low activity levels or minimal dance experience, or to face a barrier (e.g. financial) to participation in such activities.

By the end the kids that were turning up weren't the people who were perhaps, the most able or . . . they probably didn't get those opportunities and they were the ones turning up.

Dance instructor 53

She did struggle with the movement [. . .] but she kept going and she . . . I think she missed like four sessions over the whole thing, so for me that's a success story.

Dance instructor 72

However, some girls noted how participation in the intervention meant that the sessions had replaced different forms of PA that were undertaken previously.

Girl 1: *I would have been doing tap dancing.*

Girl 2: *I would have been doing hockey or rounders.*

Focus group 72

Dance instructor training

The majority of dance instructors felt that, along with the training received, their existing levels of dance knowledge and expertise prepared them to deliver the intervention.

I think that having [dance instructor who delivered the training] kind of teaching the routine was good and [. . .] the book is really handy so, yeah.

Dance instructor 21 and 51

All about the psychology of it – I find that really interesting, and that really inspired me a lot.

Dance instructor 23

It kind of reaffirmed what I already do . . . and also gave me a few new ideas or kind of . . . tips on how to do it.

Dance instructor 32

However, some elements of the induction training were considered inappropriate, particularly given the instructors' experience in teaching.

It wasn't necessary to kind of go through stuff with [dance instructor who led induction day] because we all are professional teachers that know how to play games . . .

Dance instructor 53

Bringing the group of instructors together, however, did lead to the creation of a peer-support network.

Although I knew some of [the other BGDP instructors] I didn't know some of them that well so kind of learning more about them, and what they do, and what styles they're interested in. And also, just kind of on a personal level, building that network as a freelancer, it can be quite isolating so that was quite nice to have that opportunity.

Dance instructor 32

The peer-support network particularly benefited the two most inexperienced dance instructors, who shared most issues with the instructor who led the training, which was particularly useful for coping with behavioural issues.

I tell [the dance instructor who led the training] everything . . . because I saw her every week [. . .] And to have her help me through some of the challenging things.

Dance instructor 21 and 51

The mid-intervention booster training session was identified as an occasion on which to reflect on the previous delivery of sessions and an opportunity to network and learn from a network of dance instructors.

> *That was useful just to chat with everyone and get their experiences of what had happened so far.*
>
> *Dance instructor 238*

> *That was good because you get to see what the others are going through.*
>
> *Dance instructor 62*

The length of the booster session was seen as too short by some. It would appear, therefore, that training overall was welcomed but that it needed to be better tailored to instructors' specific needs.

> *More time would have been useful. It felt quite rushed.*
>
> *Dance instructor 61*

> *We didn't really have much time . . .*
>
> *Dance instructor 42*

Fidelity to the session-plan manual

In total, 93 (26.72%) sessions were reported as being 'very' much like the manual, 164 (47.13%) were 'somewhat' like the manual and 90 (25.86%) were 'not at all' similar to the manual (*Table 41*). The extent to which the manual was followed throughout the intervention period fluctuated. However, in the first five sessions, instructors said that the session was followed 'somewhat' and 'very' like the manual. This varied more between sessions 6 and 40 (*Figure 7*).

Views on the session-plan manual were generally mixed. For some, it was viewed as a useful resource.

> *To actually be handed all of this information that someone had put together for you and just a really, a really good resource.*
>
> *Dance instructor 61*

TABLE 41 Fidelity to the session-plan manual per school

	Very		Somewhat		Not at all		Missing	
School ID	*n*	%	*n*	%	*n*	%	*n*	%
21	17	42.50	20	50.00	3	7.50	0	0.00
23	4	10.00	16	40.00	20	50.00	0	0.00
32	10	27.03	24	64.86	3	8.11	0	0.00
42	18	48.65	7	18.92	12	32.43	0	0.00
51	17	42.50	20	50.00	3	7.50	0	0.00
53	1	2.56	7	17.95	30	76.92	1[a]	2.56
61	0	0.00	37	100.00	0	0.00	0	0.00
62	8	20.00	16	40.00	16	40.00	0	0.00
72	18	47.37	17	44.74	3	7.89	0	0.00
Total	93	26.72	164	47.13	90	25.86	1	0.29

a Missing data attributable to no girls attending one session.

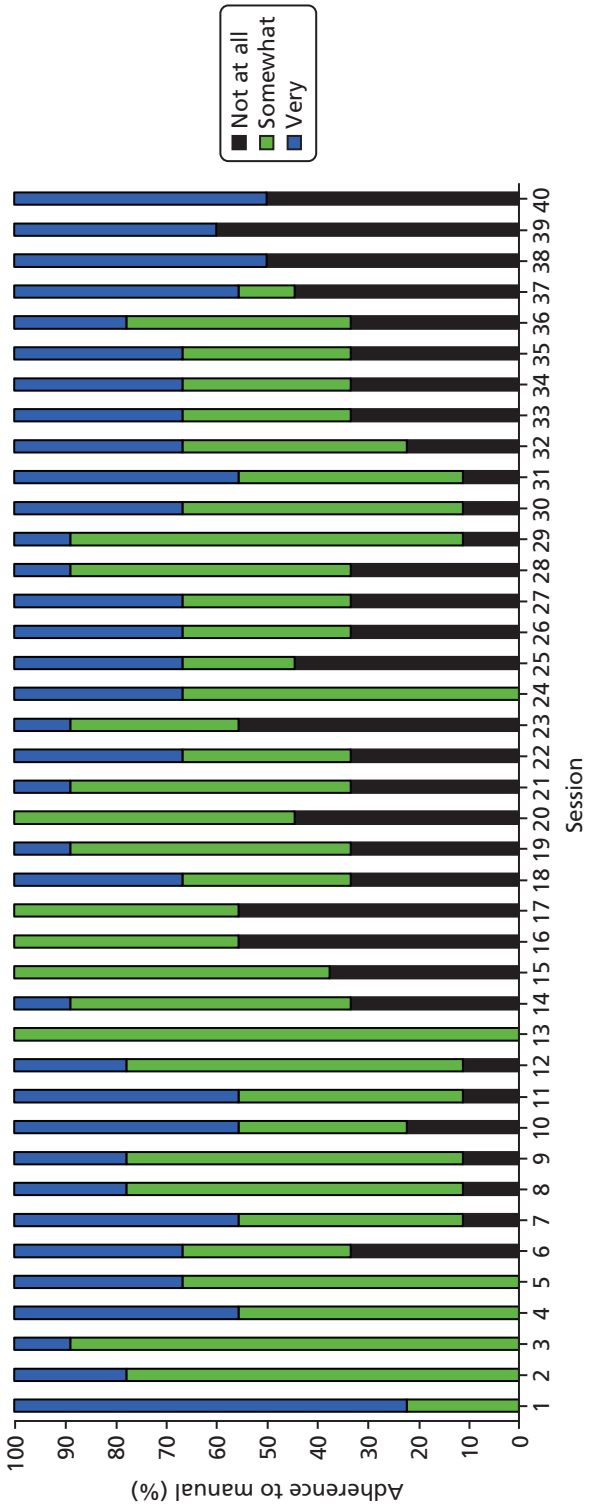

FIGURE 7 Dance instructor self-reported adherence to manual.

However, instructors felt that the level of detail was unnecessary given their existing level of training and experience.

> *Too much. Way too much.*
>
> *Dance instructor 53*

In particular, the suggested timings of sessions were thought to be unrealistic and cause worry and stress, leading to a less well-delivered session.

> *The first class for me, I was so worried about keeping it to the book that actually that kind of made it worse because the book was great but it was to the minute and therefore when you've got a class that takes five minutes to actually get in line, that's five minutes gone [. . .] I think I was so worried about that.*
>
> *Dance instructor 21 and 51*

> *The timings were just silly, because [. . .] in reality you're not going to be looking at your watch.*
>
> *Dance instructor 42*

> *I found it hard to stick to and I think the very specific timings in there are often unrealistic.*
>
> *Dance instructor 62*

However, one instructor, although she did not follow the timings, thought that they were a useful guide and should be kept in the manual.

> *She's got like three minutes for this, two minutes for that, and that was totally irrelevant for me. But that does cater for everyone's style because you can ignore it or you can use it so it's good to have it there.*
>
> *Dance instructor 23*

Furthermore, session-plan content in initial sessions was at odds with how instructors would have normally led the sessions.

> *Where it went wrong for me was [when] trying to stick to the manual I maybe did things that near the beginning that I wouldn't have done and that maybe set things up slightly against me in terms of managing behaviour and stuff.*
>
> *Dance instructor 42*

As such, dance instructors altered session plans accordingly; the manual was used as a 'guide' and allowed participant input to structure sessions.

> *My girls were like my manual if that makes sense. They were like guiding [. . .] the programme for me.*
>
> *Dance instructor 61*

As mentioned above, adhering to the manual was often difficult when faced with intermittent attendance.

> *I found it [the manual] hard to stick to. But that's because I wouldn't get the same kids from one session to another so you can't have continuity.*
>
> *Dance instructor 62*

During the training and within the session-plan manual the instructors were encouraged to develop behavioural guidelines with their groups. However, only four dance instructors discussed creating these guidelines with their groups.

> *On maybe [the] second session, third session, we together wrote some guidelines and rules if you like, which were about not talking when other people were talking and all the usual sort of things and we always came back to those.*
>
> *Dance instructor 32*

A total of 14 sessions were covered by different instructors, because the main instructor was not available to deliver that session. In these cases, the session may have been a 'one off' and the delivery did not refer to the manual.

> *I just go in and treat it [covered sessions] like a taster session [. . .] so it was just going in and having a bit of fun really. Kind of letting them pick the music . . . or they show me a dance that they've done.*
>
> *Dance instructor 53*

Receipt of the intervention

This section focuses on receipt of the intervention, including the perceived levels of enjoyment and exertion of girls in the sessions, and the qualitative perceptions of the impact of the intervention.

Enjoyment

The average perceived enjoyment ratings are presented by school and visit number (1–4) in *Figure 8*. The self-reported findings suggest that girls very much enjoyed the dance sessions [mean 4.3/5 (SD 0.3)]; these high levels were maintained throughout the intervention.

Qualitative work with girls further suggests that the girls enjoyed the sessions. Group work and dancing to popular music were identified as particularly enjoyable.

> *I think because the sessions were actually really good and I enjoyed them quite a lot.*
>
> *Focus group 72*

> *[The second dance instructor] had like different music every lesson, like recent music and stuff. So that made it like more fun because we like knew the songs and stuff.*
>
> *Focus group 23*

Dance instructors also felt that the girls enjoyed the sessions.

> *We did musical theatre which they absolutely loved.*
>
> *Dance instructor 21 and 51*

Girls did not enjoy some dance styles; for example, 'dance style A' was particularly disliked because the choreography was considered embarrassing. This was seen as contributing to the decline in attendance among girls. Repetition of dance routines and learning sequences/moves when they had missed a session were also disliked by girls.

> *It dropped off a little bit when she changed styles to [dance style A], and after there was a huge drop off. I actually think a lot of them would have carried on and stayed doing street.*
>
> *School contact 61*

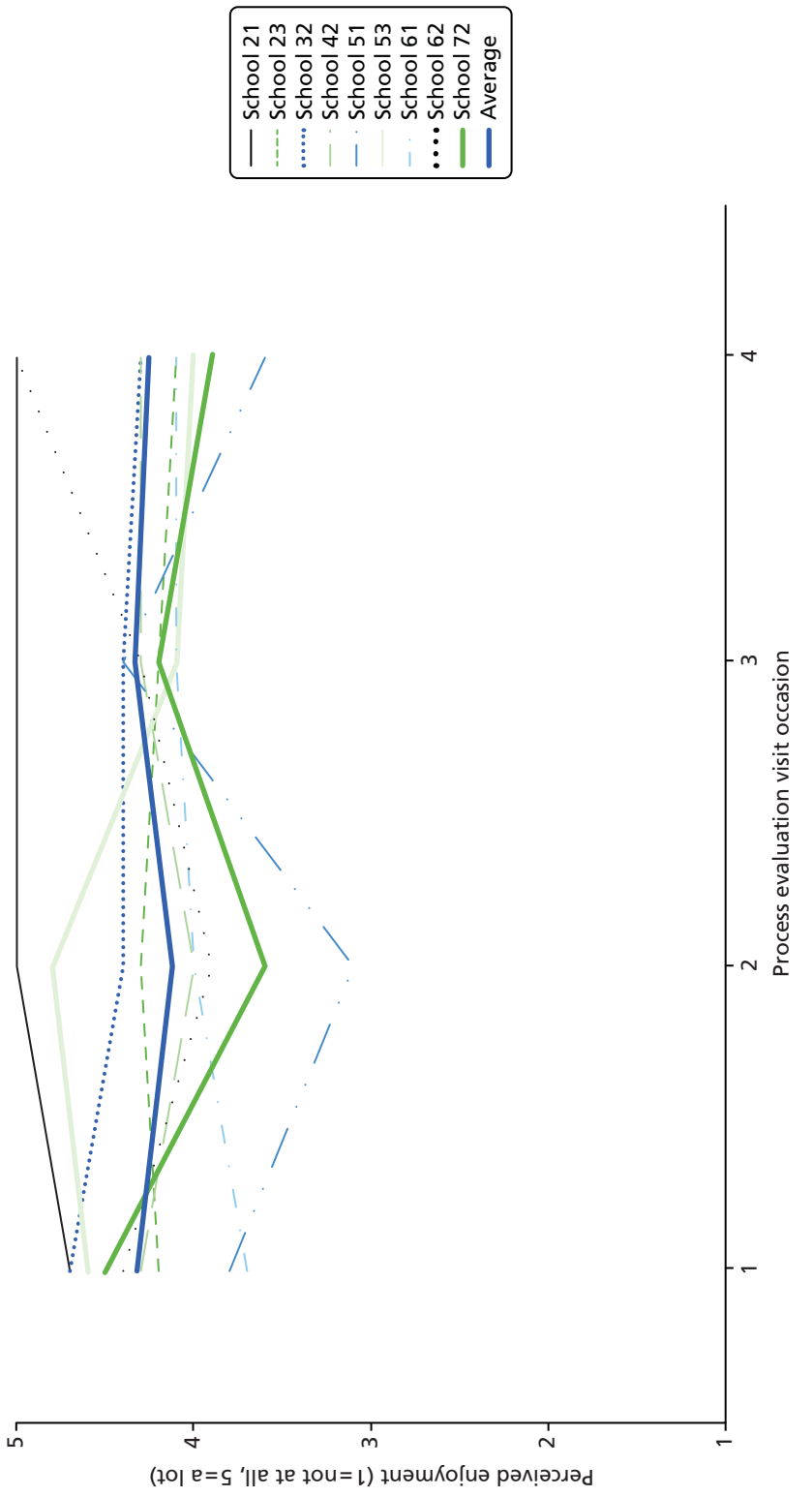

FIGURE 8 Mean perceived enjoyment per school on four occasions during the 20-week intervention.

A bit embarrassing really [dance style A]. But I didn't even do it but it just looks embarrassing because like you do weird moves.

Focus group 61

And like when someone like didn't come and then they come the next day [. . .] we would have to like show it all again.

Focus group 42

They'd get bored of re-teaching it [the material that was missed] when there would be another new person at the next session and then another new person.

Dance instructor 53

Exertion

Mean exertion levels were low [3.7 (SD 0.9)] and remained consistently so at each measure (*Figure 9*). In contrast, the qualitative data suggest that many girls did find sessions physically challenging. Several dance instructors took note of this, suggesting that some of the girls' fitness levels meant that they struggled to keep up.

We did this exercise [. . .] After 30 seconds the first time we were tired and couldn't do it. Then after a few sessions [. . .] we could do it for like 10 minutes.

Focus group 53

Some of . . . their fitness levels were so low that they would be dipping in and out purely because they were out of breath or they did need a sit down.

Dance instructor 42

Health, well-being and psychological benefits

In six schools, girls noted the health benefits of engaging in the project, including greater energy, fitness, flexibility and weight loss.

I couldn't do press ups. Now I can [. . .] I didn't know how to and I sort of couldn't. Now I can do them.

Focus group 53

I didn't ever really try to touch my toes. I wasn't really . . . I didn't do sports and I didn't really . . . but now I can touch my toes. [. . .] And I feel like I lost some weight.

Focus group 53

I'm more flexible and I've got like I've got more energy.

Focus group 51

Dance instructors noted the low fitness levels of girls, but only one instructor recounted a girl mentioning that her fitness improved.

She recognised in herself the difference in her fitness level and was saying how she felt so much fitter and how at the beginning she would get really red faced and out of breath and now that she's started 'I don't feel out of breath at all at the end of the lesson'.

Dance instructor 42

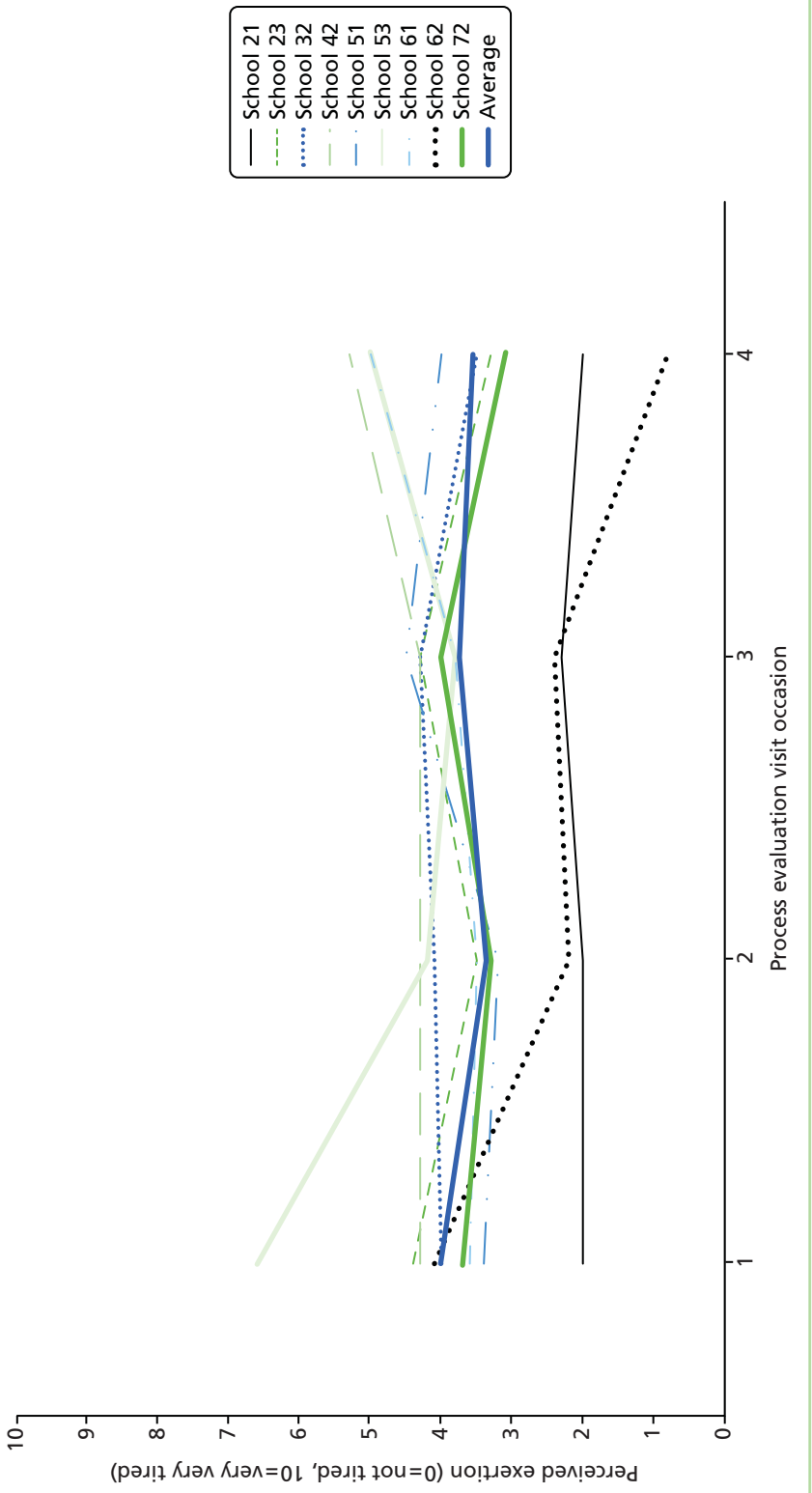

FIGURE 9 Mean perceived exertion by school on four occasions during the 20-week intervention.

Five school contacts suggested that the project had physical health benefits for girls. However, only six contacts regularly visited the sessions and, therefore, the reliability of these responses should be considered in light of the varied level of involvement, with two school contacts admitting that they had 'no idea' of the impact of the project.

> *I couldn't say this person has definitely benefited from the project, mainly because [. . .] I wasn't there in the sessions and seeing their progression.*
>
> *School contact 72*

Nevertheless, one school contact who had attended some sessions and both performances noted the benefits of the project in terms of improving fitness.

> *When they did the first session they were just puffing after like 15 minutes whereas as they went on they would obviously go on for longer. So yeah, I would say the ones that carried it on did get fitter.*
>
> *School contact 32*

Generally, girls' confidence to dance and to contribute to the lessons was said to increase over the course of the intervention. The sessions also appeared to contribute towards a greater sense of well-being.

> *By the end they were all whooping and you know, saying really positive lovely things to each other as well as some constructive feedback, and I think their confidence had grown quite a lot.*
>
> *Dance instructor 32*

> *It was more around the kind of dance and confidence that I really noticed and in some of them are actually like . . . some of them are very talented.*
>
> *Dance instructor 61*

> *It like got me a bit more confident around my friends because usually I wouldn't really do like dancing.*
>
> *Focus group 42*

> *I like being a part of Active7 because it was like we all really got on and it was just like a relaxation after school.*
>
> *Focus group 32*

A number of school contacts were sceptical about the long-term impact on the girls' activity levels owing to the high attrition rate, particularly for those who were already active.

> *They all lead really healthy lifestyles, and a lot of them dance outside school already [. . .] so I can't see it being a massive impact in increasing their activity because they already do quite a lot.*
>
> *School contact 23*

Plans to continue dancing

One school contact suggested that participation in the intervention increased the likelihood of future dance engagement during curriculum time. Six dance instructors suggested that girls' interest in the BGDP may continue into Year 8.

> *They just want to keep dancing and again one of the girls' mums said to me that from going to my classes she's absolutely loved it and from now on she wants to join another dance class.*
>
> *Dance instructor 21 and 51*

> *I did ask if they were all going to continue with some form of dance and they all were 'yeah, yeah, really want to'.*
>
> *Dance instructor 62*

I mean they all wanted Active8 [desire to continue with Active7 into Year 8], they kept talking about it.

Dance instructor 32

Some girls expressed an interest in continuing to dance. Overall, however, few girls articulated any strong intentions to start a formal dance class. Some were scared to start a new club by themselves, others were unsure whether or not they could attend a class that was not free. Others felt that they were too busy with other activities.

I might just dance in my free time, because like if you've got a class you can't make more things, but if you dance in your own free time you can watch like [. . .] on YouTube and [that is] how I learn that in my free time.

Focus group 42

I'm not sure because when we came to Active7 we were all really nervous that we didn't know anybody and I don't really think I want to do that again.

Focus group 61

I like dancing but my mum can't afford it and stuff so.

Focus group 62

I don't know [whether to join another dance club], because I have a lot of things going on.

Focus group 42

Summary

The data presented in this chapter highlight issues regarding attendance at dance sessions. The decrease in attendance over time was considerable; however, the number of girls who never attended a session or withdrew from sessions was relatively low. Dance instructors and girls felt that the dance sessions brought about positive health and psychological changes, particularly as regards their confidence to dance. Enjoyment levels remained high; however, some of the girls disliked the repetition of content, certain dance styles and having to perform to a crowd. Exertion scores were low throughout, although both the instructors and girls described the sessions as physically exerting. Training was felt to adequately prepare the instructors to deliver the intervention, although some areas were described as inappropriate given the level of experience of some instructors. Fidelity to the manual was initially relatively high, but as instructors got to know the girls, they moved away from the manual to allow for greater input from girls.

The decline in attendance was noted as being common to after-school programmes and not indicative of dance interventions per se. This pattern in attendance is reflected in other after-school studies.[38,90,91] Although some dance instructors were disappointed with the decline, it was not always perceived to have a negative impact. A variety of informant groups described the decline as facilitating stronger relationships between the girls and dance instructors who continued to attend. Dance instructors also found it easier to teach smaller groups. Various authors promote and have used small groups of children in the delivery of interventions.[92,93] Despite this, a result of the fluctuating attendance was that dance instructors found it difficult when having to repeat content. As such, greater emphasis needs to be placed on consistent attendance.

The data demonstrated that the key reasons for not attending sessions related to factors outside the study, such as having other commitments or events to attend. These findings are comparable to previous interventions with young people.[91,94] Friendship groups were seen both to challenge and to encourage attendance. Some girls would attend sessions because their friends did; however, this meant that some stopped attending if friends missed sessions. Girls have previously reported that they would be more likely to attend a session if their friends encouraged them to go.[19] In the current study, girls described enjoying

the sessions, further suggesting that the decline in attendance is not related to content; indeed, 12.3% of the girls did not attend any sessions. This is in line with other studies that have reported high enjoyment yet have still experienced declines in attendance.[39,94,95]

Aspects that were enjoyed by girls included learning new dance material, group work and dancing to current music. The perceived levels of exertion for dance sessions were low, similar to findings from the BGDP feasibility trial in which average exertion was 3.5 (out of 10).[38] The qualitative data in the current study suggest that most girls found the sessions physically exerting; some enjoyed this challenge, whereas others found it tiring. This raises the question of how appropriate this measure is for adolescents, as it appears that it may be misunderstood or ineffective in gathering accurate assessments of exertion. For example, the measure was taken at the end of the session and, therefore, required girls to reflect back over the entire session when reporting their level of exertion. Both girls and school contacts thought that the intervention had a positive impact on participants' fitness, confidence to dance and mental well-being. This may have contributed to girls expressing an interest to continue dancing. Some suggested that they would like to take part if the BGDP was offered in the following year.

Dance instructors felt prepared to deliver the intervention as a result of the training. However, many instructors felt that elements were inappropriate given their significant experience. Having formed a social network as a result of the training, instructors found the mid-intervention booster session useful and valued the opportunity to reflect on their experiences. Similar findings were reported in the HEALTHY study.[96] The session-plan manual was considered a useful resource, although many found that it contained excessive detail (again, particularly for those instructors with a great deal of experience). This is likely to contribute to the varying levels of fidelity to the manual. The majority of instructors adhered to the manual in the earlier sessions, but as the intervention progressed they began to develop sessions based on what the girls wanted to cover. Fidelity was slightly lower than has been reported in other studies;[90,95] however, this was expected to an extent, as instructors were encouraged to be autonomy-supportive and responsive to the needs of the girls.

A final point of note is that communication with, and support from, school contacts was highly valued by the dance instructors. Poor communication and/or an unwillingness by school contacts to help dance instructors made elements of managing sessions more difficult than if assistance was received. Such issues can be avoided if school contacts are aware of what is required of them.

Conclusion

This chapter reveals the major issues and influencing factors attached to the delivery of the BGDP. The decline in attendance, which in most part was affected by friendship groups and influenced by competing commitments, was a key factor. However, this resulted in smaller, more manageable, groups that the girls enjoyed. Different elements that girls enjoyed and did not enjoy were outlined, providing valuable information for future research. Fidelity to the session-plan manual was lower than in previous studies. However, the low level of session-plan fidelity may, in fact, signify high levels of theory fidelity and demonstrate that instructors were enabling the girls' autonomy.

Chapter 7 Theory-based process evaluation

Basing interventions on a theory of behaviour change provides a framework against which evaluators can assess whether or not an intervention was implemented as planned.[97] This chapter aims to examine the intervention in relation to SDT, the theory on which the intervention was based. All qualitative work included elements that explored the intervention in terms of the core elements of SDT. Aspects of SDT adherence were assessed quantitatively. The discussions that follow were considered the most insightful of the issues raised in the interviews and raise some important reflections on the implementation of the BGDP intervention, as well as useful information for future interventions. In particular, this chapter evaluates: (1) the degree to which dance instructors adopted an autonomy-supportive versus controlling motivating style; (2) dance instructors' experiences of delivering a SDT-based intervention; (3) girls' perceptions of the dance instructors' motivating style; and (4) girls' perceptions of satisfaction of autonomy, competence and relatedness (i.e. target intervention mediators). This was achieved by organising data into themes: (1) dance instructor training and acceptance of the intervention theory; (2) autonomy support and perceptions of autonomy need satisfaction; (3) competence support and perceptions of competence need satisfaction; (4) relatedness support and perceptions of relatedness need satisfaction; and (5) challenges of delivering a SDT-based PA intervention for children.

Dance instructor training and acceptance of the intervention theory (self-determination theory)

Dance instructors held positive views about the training and believed that the principles of SDT were appropriate to underpin the dance sessions. Most instructors believed that their existing teaching style conformed with the central tenets of SDT. They reported benefiting from the close alignment of their existing approach with that of the intervention.

> *A couple of those things [motivational techniques] come naturally anyway because I feel I encourage them to do events and give them the roles within their group . . . it's something that I always do anyway.*
>
> *Dance instructor 23*

> *I think it's what I would do anyway [teaching that aligns with SDT], but it's always useful. And it also helps you to highlight and to actually see what you're already doing.*
>
> *Dance instructor 61*

Some instructors found that aspects of their existing teaching style was challenged to some extent after completing the training. They described thinking about how to use vocabulary that was supportive of SDT during lessons.

> *You can get into a groove with how you teach and [the introduction of SDT] really made you challenge those sort of key phrases that you say throughout the class.*
>
> *Dance instructor 23*

> *So in terms of like how to make improvements, how to develop things. That made me think more to, you know, be careful of how I'm wording things.*
>
> *Dance instructor 61*

Observed dance instructor teaching practices

During four randomly observed sessions in each school (details of method and selection of sessions are discussed in *Chapter 2, Process evaluation methods*), an observer rated dance instructors' teaching style on four teaching practices, namely, relational support, structure before and during the activity, and autonomy support. The results are presented in *Table 42*.

TABLE 42 Dance instructor adherence to SDT observation

Observation	Relational support, mean (SD)	Structure before activity, mean (SD)	Structure during activity, mean (SD)	Autonomy support, mean (SD)	Overall score, mean (SD)
Instructor 21					
Observation 1	2.34 (0.47)	1.63 (0.35)	1.36 (0.35)	1.06 (0.23)	1.60 (0.19)
Observation 2	2.52 (0.32)	2.06 (0.24)	1.95 (0.42)	1.13 (0.42)	1.92 (0.23)
Observation 3	2.56 (0.24)	1.80 (0.31)	1.80 (0.50)	1.13 (0.31)	1.82 (0.22)
Observation 4	2.00 (0.67)	1.50 (0.59)	1.32 (0.60)	1.14 (0.31)	1.49 (0.43)
Average	2.35 (0.50)	1.74 (0.44)	1.60 (0.54)	1.12 (0.31)	1.70 (0.33)
Instructor 23a					
Observation 1	2.50 (0.23)	1.90 (0.30)	1.60 (0.62)	1.38 (0.77)	1.84 (0.37)
Observation 2	2.28 (0.52)	1.98 (0.65)	1.92 (0.42)	1.19 (0.59)	1.84 (0.45)
Average	2.39 (0.41)	1.94 (0.50)	1.76 (0.54)	1.28 (0.68)	1.84 (0.40)
Instructor 23b					
Observation 3	2.57 (0.21)	2.12 (0.40)	1.44 (0.41)	1.46 (0.65)	1.90 (0.27)
Observation 4	2.37 (0.31)	1.64 (0.53)	1.69 (0.81)	1.46 (0.55)	1.79 (0.40)
Average	2.46 (0.28)	1.86 (0.52)	1.58 (0.66)	1.46 (0.58)	1.84 (0.34)
Average 23a + 23b	2.43 (0.35)	1.90 (0.51)	1.66 (0.61)	1.38 (0.63)	1.84 (0.37)
Instructor 32					
Observation 1	2.55 (0.32)	2.10 (0.46)	1.90 (0.81)	0.92 (0.48)	1.87 (0.32)
Observation 2	2.73 (0.25)	2.05 (0.26)	1.68 (0.44)	1.06 (0.40)	1.89 (0.17)
Observation 3	2.38 (0.33)	1.78 (0.32)	1.77 (0.48)	0.66 (0.38)	1.65 (0.23)
Observation 4	2.16 (0.20)	2.07 (0.31)	1.73 (0.47)	1.09 (0.59)	1.76 (0.24)
Average	2.44 (0.35)	2.01 (0.35)	1.77 (0.46)	0.95 (0.49)	1.79 (0.25)
Instructor 42					
Observation 1	2.18 (0.44)	1.12 (0.64)	0.867 (0.44)	1.25 (0.54)	1.35 (0.41)
Observation 2	1.76 (0.44)	1.00 (0.35)	1.42 (0.33)	1.28 (0.46)	1.36 (0.29)
Observation 3	1.85 (0.59)	0.88 (0.45)	0.92 (0.44)	1.98 (0.29)	1.41 (0.35)
Observation 4	2.13 (0.45)	1.32 (0.46)	1.10 (0.47)	1.56 (0.30)	1.53 (0.29)
Average	1.98 (0.51)	1.08 (0.49)	1.07 (0.46)	1.54 (0.49)	1.42 (0.33)

TABLE 42 Dance instructor adherence to SDT observation (*continued*)

Observation	Relational support, mean (SD)	Structure before activity, mean (SD)	Structure during activity, mean (SD)	Autonomy support, mean (SD)	Overall score, mean (SD)
Instructor 51					
Observation 1	2.65 (0.27)	1.87 (0.39)	1.40 (0.50)	1.29 (0.40)	1.80 (0.31)
Observation 2	2.52 (0.24)	1.58 (0.29)	1.35 (0.37)	1.37 (0.59)	1.70 (0.27)
Observation 3	1.85 (0.66)	1.35 (0.40)	1.21 (0.64)	1.18 (0.72)	1.40 (0.35)
Observation 4	2.27 (0.20)	1.92 (0.37)	1.50 (0.46)	1.00 (0.47)	1.671 (0.24)
Average	2.30 (0.51)	1.66 (0.42)	1.36 (0.50)	1.21 (0.57)	1.63 (0.33)
Instructor 53					
Observation 1	2.11 (0.38)	1.62 (0.30)	1.70 (0.62)	0.70 (0.33)	1.53 (0.26)
Observation 2	1.52 (0.58)	1.42 (0.53)	1.68 (0.56)	0.80 (0.35)	1.36 (0.34)
Observation 3	2.05 (0.50)	1.83 (0.64)	1.58 (0.83)	0.81 (0.34)	1.57 (0.47)
Observation 4	1.98 (0.51)	1.32 (0.47)	1.36 (0.79)	0.52 (0.26)	1.30 (0.38)
Average	1.93 (0.53)	1.55 (0.53)	1.57 (0.71)	0.70 (0.33)	1.44 (0.38)
Instructor 61					
Observation 1	2.20 (0.50)	1.96 (0.63)	1.18 (0.53)	0.84 (0.30)	1.54 (0.37)
Observation 2	2.07 (0.36)	1.61 (0.37)	1.27 (0.45)	1.39 (0.57)	1.59 (0.26)
Observation 3	2.37 (0.22)	1.89 (0.58)	1.15 (0.46)	1.32 (0.33)	1.68 (0.24)
Observation 4	2.20 (0.26)	2.07 (0.50)	1.23 (0.40)	0.96 (0.24)	1.62 (0.26)
Average	2.21 (0.36)	1.88 (0.54)	1.21 (0.45)	1.13 (0.44)	1.61 (0.28)
Instructor 62					
Observation 1	2.50 (0.31)	1.78 (0.75)	1.90 (0.57)	0.96 (0.40)	1.79 (0.40)
Observation 2	2.58 (0.42)	1.58 (0.50)	1.49 (0.61)	0.98 (0.47)	1.66 (0.41)
Observation 3	2.36 (0.40)	1.90 (0.48)	1.97 (0.55)	1.28 (0.28)	1.88 (0.31)
Observation 4	2.62 (0.18)	2.14 (0.50)	1.60 (0.49)	0.98 (0.38)	1.83 (0.28)
Average	2.52 (0.35)	1.84 (0.59)	1.73 (0.58)	1.04 (0.40)	1.78 (0.36)
Instructor 72					
Observation 1	2.73 (0.26)	2.14 (0.46)	2.35 (0.69)	1.86 (0.78)	2.27 (0.42)
Observation 2	2.29 (0.27)	1.74 (0.51)	1.58 (0.55)	1.06 (0.38)	1.67 (0.33)
Observation 3	2.32 (0.25)	1.49 (0.36)	1.59 (0.65)	1.31 (0.45)	1.68 (0.34)
Observation 4	1.90 (0.49)	1.76 (0.38)	1.61 (0.44)	1.20 (0.43)	1.62 (0.28)
Average	2.31 (0.44)	1.79 (0.48)	1.79 (0.67)	1.36 (0.61)	1.81 (0.43)
Total					
Observation 1	2.43 (0.41)	1.81 (0.56)	1.60 (0.67)	1.15 (0.60)	1.75 (0.42)
Observation 2	2.79 (0.52)	1.69 (0.52)	1.59 (0.51)	1.15 (0.50)	1.68 (0.35)
Observation 3	2.25 (0.48)	1.66 (0.56)	1.48 (0.63)	1.23 (0.56)	1.66 (0.35)
Observation 4	2.17 (0.44)	1.74 (0.54)	1.46 (0.59)	1.10 (0.49)	1.62 (0.35)
Average	2.29 (0.47)	1.73 (0.54)	1.53 (0.60)	1.16 (0.54)	1.67 (0.37)

The most frequently observed teaching practice among all instructors was relatedness support. During the dance activities overall, instructors provided moderate structure before the sessions, and structure during the sessions was, on average, 'sometimes observed' in the sessions led by instructor 4. The least observed teaching practice was autonomy support.

The agreement between observers exceeded the statistical expectation (*Table 43*). The weighted Kappa matrix is presented in *Table 44* and ICCs in *Table 45*.

Table 44 shows the weighting of scores between coders that was used in the calculation of the κ-statistic. Coders scoring the same number was weighted at 1.0, coders scoring one number apart was weighted at 0.75, coders scoring two numbers apart was weighted at 0.3 and coders scoring three numbers apart was weighted at 0.0. For example, when coder 1 gave a score of 0 and coder 2 also gave a score of 0, this was weighted at 1.0; when coder 1 gave a score of 0 and coder 2 gave a score of 1, this was weighted at 0.75.

Table 45 indicates that there was poor similarity between observers' ratings for relatedness and fair-to-moderate similarity between ratings for autonomy, structure before and structure during sessions.[98,99]

TABLE 43 Agreement between observers (six sessions double coded)

Teaching practice	Agreement (%)	Expected agreement (%)	Kappa	SE	*p*-value
Relatedness	64.87	58.42	0.16	0.047	< 0.001
Structure before	79.10	61.41	0.46	0.041	< 0.001
Structure during	79.80	60.80	0.48	0.037	< 0.001
Autonomy	74.57	64.37	0.29	0.040	< 0.001

SE, standard error.

TABLE 44 Weighted Kappa matrix

	Coder 2			
Coder 1	0	1	2	3
0	1.00	0.75	0.30	0.00
1	0.75	1.00	0.75	0.30
2	0.30	0.75	1.00	0.75
3	0.00	0.30	0.75	1.00

TABLE 45 Intraclass correlations for psychosocial observation

Psychosocial observation	ICC	Lower 95% CI	Upper 95% CI
Relatedness	< 0.001	< 0.001	< 0.001
Structure before	0.314	0.152	0.540
Structure during	0.565	0.410	0.707
Autonomy	0.408	0.241	0.599

Need support and satisfaction

Compared with reports of fidelity to the dance session manual, the results suggests that dance instructor fidelity to the theoretical underpinnings of the project (i.e. adopting an autonomy-supportive teaching style and supporting girls' needs for autonomy, competence and relatedness) may have been stronger. Instructors described attempting to deliver dance sessions in a manner that supported the psychological needs of the girls. Confirming this, girls' experiences generally suggest a level of need satisfaction. However, there was greater diversity in girls' experiences of this than the instructors' reflections on providing need support. For a summary of the qualitative assessment of fidelity to SDT and potential areas for improvement, see *Appendix 8*.

Autonomy support and perceptions of autonomy need satisfaction

Instructors described going to considerable lengths to provide girls with choice over the various elements that make up each session, including the music, dance styles, choreography and warm-up activities; notably these choices were more often 'option choices' than 'action choices'.[100]

> *Some lessons they just wanted to lead it and do their own choreography, choose the music . . .*
>
> *Dance instructor 62*

> *They were able to express themselves in their own way when it comes to choreography so they could, you know, in their creative tasks.*
>
> *Dance instructor 72*

> *We put our own ideas into the dance and stuff and then she like built around it.*
>
> *Focus group 51*

> *She [dance instructor] picks someone to do the warmup so we all get a chance to do our own warmup.*
>
> *Focus group 51*

Instructors' autonomy support was assessed via child-completed questionnaires at T1. Pupils reported on the degree to which they felt that their instructor provided autonomy support. The results are presented in *Table 46*. The average score across schools was 4.68 (1.68), indicating that girls felt moderate to high levels of perceived autonomy. There was some variation across schools where the range in scores was 4.23 (1.65) in School 51 to 5.53 (1.20) in School 23.

TABLE 46 Pupil-rated autonomy support

School ID	Scale average	SD
21	4.33	1.64
23	5.53	1.20
32	4.39	1.56
42	5.20	1.48
51	4.23	1.65
53	4.30	1.65
61	4.36	1.72
62	4.61	2.03
72	4.98	1.71
Overall	4.68	1.68

The choice of music was an important area in which dance instructors could facilitate ownership/autonomy within sessions. This was reflected in comments from some girls regarding their lack of music choice. Those who did choose their music appreciated the opportunity to do so, as it gave them a chance to become more engaged and made sessions more relevant. In addition, owing to increased engagement, it was suggested that girls increased their activity and creativity levels.

> *I think it was better if we could have chosen the songs.*
>
> *Focus group 32*

> *If it's music they like then [. . .] they're going to be more active and more involved. It just makes perfect sense to . . . let them have that choice in the music and it motivates them more.*
>
> *Dance instructor 42*

> *When you put on something that you like [when they got to choose the music], you get to really express yourself.*
>
> *Focus group 42*

A strategy proposed in the session-plan manual and training manuals encouraging instructors to support autonomy within a clear structure was to involve girls in the development of group rules.

> *We together wrote some guidelines and rules if you like, which were about not talking when other people were talking and all the usual sort of things.*
>
> *Dance instructor 32*

> *We had to write rules of dance club and all of our rules were things . . . which they came up with [. . .] like listening to each other, respecting each other, not laughing at each other, helping each other, supporting each other . . .*
>
> *Dance instructor 42*

The data suggest that the majority of instructors attempted to respond to feedback from the girls and made efforts to include the views of the whole group, not just a vocal minority (although some girls argued to the contrary).

> *I would read their [dance] diaries and sometimes they would write things in there, either about the session that would give me clues as to what . . . you know, 'oh, I loved this game'.*
>
> *Dance instructor 42*

> *So I decided that a silent vote would probably be the better option, 'cause then everybody gets their say and nobody is influenced by each other.*
>
> *Dance instructor 23*

Four school contacts expressed views relating to autonomy, stating what choices the girls experienced within Active7 (previously reported as BGDP; however, the project was known locally as Active7, and, therefore, qualitative findings will refer to it as Active7). For example, one interviewee endorsed the project for its ability to foster empowerment and choice among girls.

> *I think for some of them it may have like reinforced [to] them that they don't want to do dance again; it might not be their cup of tea. And so in terms of choices, it's had an impact on them; they've had a service, they've had an experience and they've been able to make an informed choice about what they like and what they don't like.*
>
> *School contact 72*

Generally, girls were pleased with the level of autonomy that they received. However, it is important to note that they felt a need for instructors to balance this with sufficient guidance to ensure that they were able to engage in and enjoy the task.

> *We were just sort of like left to do things on our own and like hardly no one knew what to do.*
>
> *Focus group 21*

> *It was different because you have control of everyone. It was a bit weird.*
>
> *Focus group 51*

In contrast, one school contact's suggestion implied that she felt that the girls were not granted sufficient choice over the activities covered in sessions. This contact suggested that in future projects individuals should be encouraged to base their actions on their own reasons and values, and that instructors could facilitate opportunities for participation and choice.

> *You could obviously do like a student voice based on what they'd want as a group [. . .] a number of weeks you would spend on a certain dance style and then another one [. . .] hopefully that way they would see that actually they were having a say in it and they would actually commit to it a bit more.*
>
> *School contact 72*

Dance instructors' use of controlling teaching styles

Despite the data reported above, girls from several schools (one in particular) discussed the use of controlling teaching techniques by their instructor. These pupils' quantitative perception of these instructors' provision of autonomy support was also low in comparison with other pupils' perceptions.

> *We weren't allowed to choose the songs or the dances or we had no say in what we would like to do.*
>
> *Focus group 32*

> *I do think that was unfair because if we needed a drink we should be allowed to get a drink.*
>
> *Focus group 21*

Comments from two schools implied that the girls 'had no say in pretty much anything' (Focus group 32). In addition, some girls felt that where they were given choice it was not perceived as genuine.

> *She was asking us to choose a dance and then she'd choose a dance herself.*
>
> *Focus group 21*

> *She'd ask us and then she'd just pick herself.*
>
> *Focus group 62*

Girls considered the frequency and length of drink breaks to be important to their perceived autonomy. This was not mentioned by the instructors in relation to autonomy support, but was thought of as an opportunity for disruption for which extra rules had to be developed.

> *When we got a break they were really short and it didn't really give us time to do everything.*
>
> *Focus group 32*

> *I would say things like, with water breaks and stuff, 'oh, can I go toilet?' I was like 'you've got until the end of this song'.*
>
> *Dance instructor 21*

Various focus groups justified some of this controlling behaviour. The girls understood that their instructors' behaviour may have been to avoid group arguments or to encourage dedication and attendance to the project. They were also aware that this may have been a negative experience for those who were less committed.

> *I think she was only bossy because the amount of people that were there and . . . and were like being silly . . . and no one was listening.*
>
> *Focus group 21*

> *I thought it was good because I think being strict is good.*
>
> *Focus group 53*

One instance in which girls were given choice was in the lead-up to performances. Dance instructors gave girls the choice to put on a dance performance in front of others. If they chose to do so, however, the preparatory demands of the performance led to sessions that were less autonomy supportive to ensure that girls were prepared for the event.

> *One session I had to get a bit strict [. . .] I think it was the pressure of the performance.*
>
> *Dance instructor 23*

Competence support and perceptions of competence need satisfaction

The techniques that instructors reported using to provide competence support and need satisfaction included affording girls with the required skills, differentiating the dance sequences, providing leadership opportunities, using peer role models, encouraging self-reflection and providing constructive feedback.

> *I gave variations for different movements, and during creative tasks if one group had finished it really early because they were really competent at that particular task, then I'd give them something else to do afterwards.*
>
> *Dance instructor 32*

> *Like 'oh [dance instructor name]'s put me in charge of this and I've got to sort out this' and they all had a role in their group.*
>
> *Dance instructor 23*

Dance instructors used a number of methods to help girls reflect on their competence, including encouraging girls to consider the goals that they had set and to think about whether or not they had achieved them. Dance diaries helped to achieve this.

> *They loved them [dance diaries].*
>
> *Dance instructor 21 and 51*

Instructors' knowledge and mindfulness of different abilities within the group allowed them to deliver targeted competence support. It enabled instructors to play to girls' strengths, fostering a sense of competence.

> *Seeing myself in those girls that would struggle [. . .] it goes back to that choice actually, that I'd give them the choice.*
>
> *Dance instructor 21 and 51*

> *At the beginning I wouldn't have given them [. . .] as much choice because I think sometimes when they're inexperienced or not been exposed to different things, they think they want to just do one thing [. . .] so I think it's good to kind of expose them to different styles and different music.*
>
> *Dance instructor 42*

Girls confirmed the level of effort that instructors went to in order to support their competence and reported receiving individual and group-level assistance.

> *She helped. Like if you were stuck on something [. . .] she would show you how to do it.*
>
> *Focus group 23*

> *Well sometimes I don't really . . . want to perform with other people because I get quite shy and then I tell [dance instructor] and then she makes me more confident if you know what I mean, helps me.*
>
> *Focus group 61*

> *In the beginning it was really tiring, but then we started doing similar warm-ups and then [dance instructor] started helping us . . . And then now it's way easier.*
>
> *Focus group 53*

Both girls and instructors reported increased confidence and competence to dance throughout the intervention. Some quotations suggest that repeating certain dance sequences and styles may have facilitated this increase.

> *I do like this dance and because we've done it over and over again I think I find it a lot easier to do.*
>
> *Focus group 32*

> *I think as a group they've all upped their skills in terms of dance.*
>
> *School contact 72*

A readiness to try new activities was evidence for this increase in competence.

> *I think the fact that towards the end that they wanted to do a different style each session and they wanted to create their own bit each session has got to be a good indicator [that they were more confident].*
>
> *Dance instructor 62*

One school contact suggested that the intervention supported girls beyond dance and offered skills that were beneficial outside the dance context.

> *Some of the girls in here – like [one girl in particular] who is quite quiet anyway [. . .] I maybe noticed that she's a bit more confident in her PE lessons as well and it's given her something to focus on.*
>
> *School contact 23*

Girls compared their own competence in dance with that of others in the group who they felt were more able and skilled; however, by doing this they may have negatively affected their own perception of competence.

> *The people who have done dance before, I think they got a bit overconfident and they kind of became the teacher [. . .] and they kind of blamed it on us when something went wrong.*
>
> *Focus group 32*

However, some comments suggested that girls felt that they had received little support when new, complex skills were introduced. It was also implied that the instructor may not have been aware of the mixed abilities of the group members. Girls suggested that they could not control the speed at which sessions progressed.

> *When it was a harder move she took a really short time on it and when it was an easy move she took really long on it. And it was just really confusing.*
>
> *Focus group 32*

She just saw that some people could do it so she thought 'Oh everyone must be able to do it'.

Focus group 72

Relatedness support and perceptions of relatedness need satisfaction

All instructors discussed successful approaches that they adopted in order to foster a trusting relationship with and between the girls. These included responding to comments written in dance diaries, asking girls about their lives outside the intervention, giving high-fives, using a head-to-head sharing time, and discussing non-attendance.

At the end of every session I would give them a high-five. [. . .] and ask them different questions.

Dance instructor 21 and 51

She asked us about Activity Week. And she said 'Has anyone seen any dance styles this week?' And we would have a little bit of time just to say if we've done anything exciting or seen anything.

Focus group 72

Both dance instructors and girls felt like they developed a strong trusting relationship over the course of the intervention. This relationship may have facilitated an environment in which the girls felt comfortable to share details about their lives.

If we were upset she would help us.

Focus group 42

Once the first month had passed they started to be a lot more talkative and they'd all come up in the beginning and share things that had been happening in the week and ask my opinion on things.

Dance instructor 32

I had a couple of girls really open up to me and talk to me about sort of personal problems.

Dance instructor 23

The relationship between instructors and girls (and between girls themselves) improved not only with time, but also as the number of girls in the group decreased. The reduction in group size created a more intimate atmosphere in which many girls felt more comfortable.

When it was just the 15, 16 [girls attending] they were all incredibly committed and very good at letting me know if they weren't going to be there, and their energy in class was great so it was actually a lot better because it was the people that were meant to be there and wanted to be there were there.

Dance instructor 32

I think the group just became a lot more kind of personal and intimate [. . .] a lot more of a supportive environment.

Dance instructor 61

I think the girls, they had . . . in the end a really sort of dedicated, small number, but a really dedicated small team of dancers and I think they developed a really nice relationship with [dance instructor].

School contact 72

In general, girls thought that the instructors were enthusiastic, fun and 'nice' (an adjective used in most focus groups). All focus groups produced positive comments on their instructor.

> *She was really nice because we came in and she was like 'oh, you're the dancers!'[. . .] She came in and introduced herself and everything. And then she . . . if . . . some of us is injured or doesn't really want to do dance then she'll let us sit out . . .*
>
> *Focus group 61*

> *She was generally a nice person [. . .] at the start she was really, really enthusiastic about everything and then as we went on she was still enthusiastic about us to all learn the dance.*
>
> *Focus group 72*

> *Because she's so nice she didn't want them to know that we were being naughty and stuff.*
>
> *Focus group 42*

Despite this, some of the girls felt that they did not develop a genuine bond with the instructor. Some instructors were described as strict and lacking in empathy. It is worth noting that once one negative comment was made, it triggered a flow of similar comments, resulting in an amplification of negative views.

> *If we missed the session she wanted to know why we missed a session and if we'd have said our homework, apparently homework wasn't a good enough excuse . . .*
>
> *Focus group 72*

> *[Name of dance instructor] wasn't there like to support us in a way, she didn't come to it [performance] so like we didn't really know the music and we had to do that ourselves.*
>
> *Focus group 61*

> *I think she's more concentrated on her reputation than on us.*
>
> *Focus group 32*

The girls' connection with their instructor was undermined when their comments or actions were not perceived as genuine.

> *She always clapped for us but, you know, it was like for them [another group of girls] it was, it was like a proper clap.*
>
> *Focus group 32*

There was evidence for the development of existing friendships and the formation of new ones over the course of the intervention.

> *You got to know them [other girls] a lot more yeah, because you got to like hang out with them a lot more.*
>
> *Focus group 32*

> *And as I said, listening to them, they seemed to enjoy making new friends.*
>
> *School contact 23*

> *Where there were only four of them, three of them were like really close friends and then one of them wasn't. And she was the quieter girl . . . but by the end of it they'd be like 'yeah, come on [girl's name]'.*
>
> *Dance instructor 21*

At the onset of the intervention, some girls were shy and nervous and various cliques formed at the sessions. However, as time went on, these cliques dispersed and many girls made new friends and felt more comfortable in that environment.

> Girl 1: *In the first two sessions I was really shy [. . .] and I didn't really say [. . .] much because I'm quite a shy person. But then like now in the Active7 sessions I talk quite a lot [. . .] Because I got to know quite a lot of people . . .*
>
> Girl 2: *You feel more comfortable around them.*
>
> Girl 4: *Yeah. So they're sort of all like my friends and they talk to me more and they like near enough the same things as me.*
>
> *Focus group 72*

> *It was very hostile in the beginning between them, like it was very cliquey, they were all very separated and they didn't talk to each other and they were quite mean to each other. And then by the end of it the core group were so much closer.*
>
> *Dance instructor 32*

Several girls described wanting to have the opportunity to work with others they did not know in order to form new friendships.

> *I think it's always better going with people that you don't know instead of choosing who you go with . . . because when you get to meet new people.*
>
> *Focus group 51*

> *Like at the start don't put people with their friends, put them with someone else who they might not know.*
>
> *Focus group 42*

There were some reports of a lack of connection with fellow group members. Some experienced a lack of support from their peers, which appeared to be embedded in the girls' comparisons of their dance abilities, divisions between the 'confident' and 'shy' girls and different friendship groups.

> *It just got a bit annoying because everybody else was like able to do it and then you couldn't do it. But then it wasn't as if they were helping me to do it so you would know it.*
>
> *Focus group 72*

> *The sort of divide within the group, between the girls that come all the time and are sort of maybe a bit sort of geeky or a bit shier and these more sort of confident girls who sort of really throw their weight around.*
>
> *Dance instructor 23*

There were disagreements between girls within groups, which may have undermined the sense of relatedness.

> *I know that there were fallings out within the school and that meant that a few girls didn't attend sometimes because they'd had a falling out during the day.*
>
> *Dance instructor 62*

It is noticeable that one school had no reported disagreements and that girls were perceived to work well regardless of the group that they were in.

> *No-one ever had an argument with each other [. . .] no, they were fine. And they all worked within different groups as well.*
>
> *Dance instructor 53*

> *We like worked well in the group. There were like no arguments [. . .] and we all tried like to have fun.*
>
> *Focus group 53*

Challenges of delivering a self-determination theory-based physical activity intervention for girls

Managing disruptive behaviour and the use of an end-of-project performance emerged as issues that challenged the instructors' theoretical intervention fidelity. When faced with challenging behaviour or girls who ignored instructions, some instructors found it difficult to use SDT-based teaching practices.

> *When you've got 25 plus of them all going a bit mental [. . .] you do have to sort of change tactics unfortunately.*
>
> *Dance instructor 42*

> *Because we were quite happy to say 'oh yeah', like talk in a calm manner. But then after a while if the children aren't responding to you in that way, to actually find solutions to that problem – but still using the ABC [autonomy, belonging, competence] technique – I think that's what we kind of discovered in the [booster session].*
>
> *Dance instructor 21 and 51*

> *It would take them ages to get changed and things like that and because I was trying not to be in that 'come on!' role, I couldn't really push that.*
>
> *Dance instructor 23*

In addition, one instructor saw the autonomy-supportive strategies as a firm set of guidelines that she had to abide by in order to deliver the session appropriately.

> *They were running wild and I was trying to be, you know, use the ABC and it was very hard to try and keep to that [. . .] I think that's because I was so worried about sticking to 'this is what we had to do' to then kind of trying to actually respond to the children themselves.*
>
> *Dance instructor 21 and 51*

Some instructors suggested that role-play-based learning during the training would help them deal with such problems in ways that were consistent with the key themes behind SDT.

> *I would say it would be good to . . . set up some situations where that skill [teaching in an autonomy-supportive manner] could be practised, because I felt frustrated with myself sometimes that I didn't know [. . .] what to say and I didn't know how to do it.*
>
> *Dance instructor 23*

Another challenge to intervention fidelity concerned the use of dance performances (in front of other, non-group audiences) as a motivational tool and whether or not girls wanted to participate in these performances. Girls received a choice over whether or not they wanted to work towards and contribute to performances. The majority of the time, girls chose to perform. Dance instructors and school contacts considered an end of project performance to be important for motivating participation.

> *Things to work towards, so if you know that there's a show [. . .] something like that will definitely keep them [attending].*
>
> *Dance instructor 62*

> *I think the performance element of it is a really vital part actually.*
>
> *Dance instructor 61*

> *So I think it (performing) does a lot for young people in terms of confidence and experience so I think it's really important.*
>
> *Dance instructor 32*

> *I think as the girls highlighted maybe if they're working towards something. So I know a lot of them when they do dance outside school they're doing their exams and you know, their grades and so on whereas if they knew it was to do a big dance show at the end of the year or you know, a performance somewhere . . .*
>
> *School contact 23*

Instructors felt that most girls wanted a performance and that this was a positive experience for them; however, they also recognised that girls may be anxious about performing.

> *Maybe they don't [want a performance] at the start because their confidence isn't there yet, but by the end pretty much every young person I've worked with wants to perform.*
>
> *Dance instructor 32*

> *Even if they're slightly petrified of it or whatever . . . it's kind of a good fear [. . .] They did all love doing this as well.*
>
> *Dance instructor 62*

There were mixed views among the girls regarding a final performance. Some liked the motivation that it provided and felt that there could have been more opportunities for performing different routines that they had learnt.

> *If you know you're not doing it in front of lots of people you kind of lack a bit. But if you know you're doing it in front of people then you know that you've got to try and do your best and try and get the steps right.*
>
> *Focus group 23*

> *Yeah, I love going on stages and sort of showing off what we've been doing.*
>
> *Focus group 32*

However, for others, although a performance was considered a good experience, it was a source of anxiety and the support of the instructor was needed.

> *It's kind of embarrassing but then it's fun at the same time. Like everybody's watching you in the audience.*
>
> *Focus group 32*

I felt a bit worried because I thought I was going to mess up.

Focus group 62

Some people like crying and really nervous and [saying] they weren't going to do it.

Focus group 61

I think the thought [of a performance] for some of them might be too much.

School contact 51

They were really embarrassed to show their parents.

Dance instructor 21 and 51

Putting on a performance was a source of pressure for some, and one instructor suggested that it negatively affected her teaching. Some instructors found it hard to keep an environment supportive of SDT when working towards the performance.

When it came to rehearsal and things like that maybe not so much [participant ownership over the class].

Dance instructor 32

They'd got all these questions and all these different ideas but, you know, they also want to perform [. . .] you know you've got to choose something appropriate and it was difficult juggling all their different ideas.

Dance instructor 23

Motivation

The qualitative data regarding the girls' motivation for (1) dance and (2) being physically active were similar to the quantitative data presented above (see *Chapter 3, Psychosocial data*), in that they revealed little indication of any change in motivation for dancing and being active. In this section we quantify the responses given by girls for some motivational types and give an almost exhaustive account of the data, in order to demonstrate its sparsity.

Statements made by two girls relate to an identified form of motivation. In both cases the girls expressed enjoyment at engaging in dance, as it is beneficial to them or keeps them from being 'lazy'.

Sometimes, it's like you're put on the spot but I suppose that's good if you're going to do a lot more dancing things.

Focus group 53

If we're not keeping active then you're just gonna be . . . lazy.

Focus group 62

The physical activities and dancing were enjoyed by many girls because of how they made them feel.

After doing physical activities it makes you feel [. . .] happier, kind of. I kind of felt good about myself . . .

Focus group 53

In year six I did sports in the summer holidays. I kind of stopped and then when Active7 started I did sports again and [. . .] it's just made me feel better because.

Focus group 53

There was one example of a girl viewing dance as 'her thing' (an integrated form of motivation) at the end of Active7.

> *One of my girls, she was really talented. Gifted and talented I'd say – really great rhythm. And she said to me at the end 'I didn't really used to like dance'. And that really surprised me because I think 'but you're really naturally quite, you know, gifted in that sense'. 'I didn't really used to like dancing but now I absolutely love it, it's totally my thing'.*
>
> *Dance instructor 72*

Some instructors and girls believed that attendance was affected by girls feeling fortunate for being able to participate in the study (as places were restricted within each school).

> *They also understood that this was exclusive to them and there was nobody else in the school [. . .] so I think they really valued their place.*
>
> *Dance instructor 23*

> *We got chosen to do it when some people didn't so it would be unfair if we didn't go, for them, because they could have had our slot.*
>
> *Focus group 32*

External motivation to attend Active7 sessions was experienced in relation to parental encouragement/involvement, intervention components (attendance records and performance opportunities) and the adoption of forfeits by one instructor. One instructor felt that parents told girls that they must attend. Girls were also motivated to attend and indeed sign-up in order to socialise or through peer pressure.

> *With the star charts, how long we've been there . . . I felt because I've been off for so many weeks, I feel really bad that there are loads of crosses.*
>
> *Focus group 32*

> *I think their parents kind of told them to be there.*
>
> *Dance instructor 21 and 51*

> *I was telling my friend 'Shall we do it?' and she was like 'Oh I don't want to do it.' I was like 'It could be fun' and she was just, she decided to go.*
>
> *Focus group 21*

Several girls, from two schools, attended to avoid feelings of disapproval from the instructor, a blend of external and introjected motivation. The following comments are interesting as they suggest that attendance was prevented by feelings of guilt.

> *I felt [dance instructor] would be really upset with me if I didn't go and then I kind of stopped going because I was scared that she'd be angry with me every day I didn't go.*
>
> *Focus group 72*

> *If we felt sick and we had to tell her she'd say 'oh, try and join in but if not go sit down, but I would really, really like it if you would join in'. And like then she'd make us feel guilty.*
>
> *Focus group 62*

The types of amotivation mentioned included a lack of motivation or interest in completing dance diaries and attendance records, learning dances if girls had not attended the session when the dance was introduced and lack of interest in dance sessions generally.

> *I found it [completing dance diary] a bit annoying because I think we could have been doing more dances and maybe cooling down [. . .] we kind of got a bit stuck. Sometimes I didn't know really what to say.*
>
> *Focus group 32*

Theory-based process evaluation summary

The data suggest that the intervention was delivered in a manner supportive of the concepts of SDT to a modest degree. Most of the instructors felt that the central tenets of SDT already aligned with their teaching style and were able to provide autonomy, competence and relatedness support through various aspects of the dance sessions. There were certain areas in which this was challenged, from both the instructors' and the girls' points of view. However, as the qualitative data attest, training was well received by the majority of instructors, who felt that the key principles of SDT 'matched' their style of teaching, and that the training served as a reminder to attend to the 'how' of their teaching (i.e. communication practices).

Autonomy support, as described by dance instructors, came mainly in the form of music choice, dance styles, warm-up activities and choreography. Dance instructors reported providing opportunities for participant choice, which was enjoyed by girls. Having choice over these elements made sessions more engaging and relevant to the girls. The level of autonomy granted was appreciated by girls and noticed by school contacts. However, provision of choice was predominantly option choice (e.g. choosing a type of music or a dance move) and some girls reported lacking action choice (e.g. not having control over the speed of task progression). Previous experimental research suggests that providing action choice promotes self-determination and intrinsic motivation more than option choice.[100] It is likely that option choice is easier to provide than action choice and this is perhaps why this was reported as the form of autonomy support more frequently used. However, instructors who relied only on providing option choices may have believed that this was sufficient autonomy support and may have neglected other elements such as action choice. Providing both action and option choices is likely to lead to greater autonomy than using one strategy in isolation.

In order to achieve autonomy need satisfaction among the girls, it was necessary for the instructors to provide guidance and instruction. Despite successful attempts to support autonomy, dance instructors sometimes found it difficult to do so owing to behaviour issues within the class and during the lead-up to the final dance performance. This was corroborated in the teaching style ratings which showed the structure during the activities to be modest. Behavioural issues resulted in the use of controlling teaching styles. Indeed, the opinions of some girls that their instructor was controlling suggest that not all instructors used an autonomy-supportive style and, thus, there were pockets of low theoretical fidelity. This result could reflect the instructors' usual style which was unchanged by the intervention training. Alternatively, and in line with the dance instructors' views that the SDT training aligned with their usual teaching style, adopting a more controlling style may be a response to the different challenges of teaching a large group of beginners in a school setting.

Experimental research suggests that action choice, that is, being involved in decision-making processes, rather than option choice, whereby an individual's choice is restricted to selecting from a series of options, significantly affects internal loci of control, volition, perceived choice and intrinsic motivation.[100] On a practical level, this has utility in the design of programmes underpinned by SDT; providing autonomy in sessions by allowing individuals to have control over the timing, progression and differentiation of tasks, drills or performances may be one way in which to promote sufficient 'action choice'. As such, certain choices are conducive to feelings of autonomy and competence, and to subsequent levels of intrinsic motivation.

Future work is needed to identify ways in which PA intervention deliverers, who may have used controlling strategies previously, can be equipped with techniques to use in response to challenging behaviour without resorting to controlling techniques. One instructor alluded to role play techniques that mimic SDT strategies for dealing with behavioural difficulties. This is one example of a potential strategy in the future implementation of theory-based interventions. Furthermore, a challenge for developers of theory-based interventions is to identify how best to teach intervention deliverers about the underpinning theoretical nuances (e.g. action vs. option choice) in ways that are easy to understand and implement in practice.

Dance instructors appeared to be confident in providing competence support and used a multitude of techniques that could be adopted in other interventions, such as using peer-to-peer teaching, facilitating self-reflection and providing genuine encouragement, and using differentiation to account for varied ability levels. This finding probably reflects the instructors' experience in teaching dance techniques and highlights the importance of identifying well-trained intervention deliverers who can bring beneficial innovation. Indeed, instructors felt that they provided competency support via a number of methods, including differentiation of dance sequences, offering leadership opportunities and feedback, asking the girls to reflect on their own level of competence and the use of peer role models. Instructors were able to identify the girls' different abilities, allowing them to carry out and deliver the sessions using SDT more effectively. Qualitatively, both instructors and girls felt that levels of competence and confidence in dance increased over the course of the project; girls reported positive experiences of having their competence supported and some reflected directly on their increased perceived competence. However, some girls felt that their instructor was unaware of different abilities and did not give them the attention they needed when learning new skills. Being able to contribute to the speed and pace of the sessions may have afforded the girls a greater sense of competence support and satisfaction. This finding is in contrast to the quantitative need satisfaction findings in which perceived competence in dance and PA decreased pre–post intervention in the intervention group. It is possible that both results are correct and that, although some girls did feel more competent after the intervention, on average, girls did not. Using qualitative and quantitative methods has allowed us to identify this.

It is important to recognise that girls' baseline and follow-up reports of dance competence were based on different cognitive representations of dance for girls in the intervention group given their new experience. Before the intervention, most girls did not have experience of formal dance classes. However, they rated their dance competence as relatively high, which could be based on more informal experience (e.g. dancing with friends). Post intervention, having been exposed to some of the physical challenges and having been able to more clearly reflect on one's competence compared with that of others, the girls are likely to have had a different perspective on dance. Thus, girls may interpret things differently before and after the intervention and may rate their competence post intervention as lower than at baseline. This could have masked some of the more positive findings identified in the qualitative results.

Every dance instructor attempted to form trusting relationships with and between girls. They asked about girls' lives outside of class, responded to feedback in dance diaries and took time in class to reflect on sessions. Girls within some focus groups did not feel a connection with their instructor, describing them as strict or not genuine. Only a few girls reported lacking a connection with others; this was thought to be down to differences in ability and confidence levels. Girls would often focus on upwards comparison, which in some circumstances can be beneficial when it comes to enhancing competence levels; however, as the evidence here demonstrates, the use of role models must be approached carefully.

Previous research suggests that relatedness towards PE teachers is associated with engagement in PE among high-school-aged girls (15- to 18-year-old girls).[101] The qualitative data showed that dance instructors were, in most cases, able to build trusting and meaningful relationships with and between the girls through a range of techniques, representing excellent intervention innovation[102] which could be adopted in other interventions. However, for some girls, relatedness towards their instructor was undermined by perceptions of the relationship being superficial or not being treated with respect. Given the variation in instructors' provision of relatedness support, peer-based learning, where effective

techniques are shared with instructors who find creating a meaningful bond more difficult, could hold promise. Although this was included to an extent in the BGDP mid-intervention booster session, more could be done to share effective practice (either in person or via social media interactions) and challenge low fidelity during the intervention period.

Autonomous motivation was represented by some of those girls recognising the benefits of engaging in dance and inherently enjoying the sessions. Forms of controlled external motivation were evident in forms of parental encouragement, attending to maintain one's attendance record and one instructor's use of PA-based forfeits for talking. Some girls described feeling guilty if they missed sessions or would attend to avoid disapproval from their instructor.

Based on these findings, it is evident that dance instructors may need more time in training to become familiar with the theoretical components of the intervention. Incorporating role play opportunities to put the theory into practice, particularly in situations that prove challenging (e.g. misbehaviour), may be effective. Allowing and organising more time for dance instructors to meet and share experiences and ideas would provide them with more opportunities for peer learning. Future work should ensure that dance instructors know how to manage performances outside of the class with SDT and how it translates to programmes encouraging PA.

Conclusion

The data presented in this chapter pertain to the theoretical fidelity of the BGDP intervention. Recommendations for the future delivery of interventions based on theory are also presented. Together, the quantitative and qualitative data suggest that there were some areas of very strong theoretical fidelity and that the intervention 'tone' underpinned by SDT was accepted by both girls and instructors. However, the findings also reveal a number of gaps and room for improvement in theoretical fidelity within the intervention. As such, a number of recommendations are put forth which may have utility in the future design and implementation of theory-led interventions. Overall, in line with the views of Rothman,[44] basing interventions such as BGDP in well-articulated theory, translating the theory to practical intervention activities and subjecting it to thorough evaluation has resulted in the advancement of SDT-based PA interventions in trials.

Chapter 8 Lessons learnt from the delivery of Active7

This chapter examines practical issues arising from the BGDP and relating to conducting PA interventions in the after-school period within secondary schools. The data presented here are aimed at improving the experiences of schools and pupils taking part in interventions, and at improving the delivery of interventions. Three themes emerged from the qualitative analysis of the 'lessons learnt' from the delivery of BGDP. These themes explore the project design, session content and project organisation and were pertinent to the design and implementation of dance-based after-school projects, and, more generally, projects aimed at increasing the PA levels of adolescents.

Project design

As a theme, 'project design' encompassed subthemes relating to the logistical arrangements of BGDP, namely, recruitment, timetabling, session quantity and project duration.

Recruitment

Different methods of recruitment were required for each group of research participants (girls, dance instructors and school contacts). As such, researchers should consider what the most effective forms of recruitment are for each group.

Recruitment of school contacts

The methods by which school contacts became involved in the study varied. There appeared to be two different scenarios that led to school contacts' involvement: some proactively sought to take part in the project and others were asked by a colleague to act as a key contact.

> *I read it and I thought 'oh yeah, that sounds like something I'd like to be involved in'.*
>
> *School contact 62*

> *The information got sent through to school and got forwarded onto me [. . .] I was teaching BTEC [Business and Technology Education Council] dance so they kind of said 'Right, this is your area'.*
>
> *School contact 32*

Two school contacts embraced a type of research 'altruism', whereby they felt a commitment towards the research. One school contact described their familiarity with the positive assets of scientific research.

> *I've been through doing a university degree myself and [. . .] it's really important that these things are done to try and take things forward.*
>
> *School contact 23*

Targeting school contacts who are familiar with the study participants may improve logistical issues associated with the study. A general complaint among school contacts – most commonly those who were asked to act in this role – was that they did not know the Year 7 girls. This often exacerbated issues associated with project logistics.

> *I didn't know the year seven girls so, you know, it wasn't necessarily easy for me to kind of recognise and when I'm supposed to go 'oh, I need to have a word with you'.*
>
> *School contact 51*

If we were to do it again I'd make sure I know the kids beforehand because I don't know the year 7s [. . .] so that's been a massive hurdle for me, a massive problem.

School contact 42

Recruitment of dance instructors

Dance instructors were keen to be involved in the project for a number of reasons; for example, they viewed it as an opportunity to disseminate their view of dance as a positive activity for young people.

I love to dance and I love to teach dance and to share my passion with as many people as possible.

Dance instructor 61

The project was also viewed as an opportunity to develop professionally and to gain more experience.

The programme really feeds into actually your CPD [Continuing Professional Development] as a professional as well. I think it will inform my practice moving forward as always.

Dance instructor 72

Recommendations for recruiting dance instructors to future projects include obtaining endorsements from other instructors, schools and dance agencies. One instructor suggested that knowing the competence, ability and willingness of the instructor prior to employment would be beneficial. Workshop afternoons were also endorsed as a possible recruitment strategy.

I don't hire people without seeing them teach. So it's either going by recognition from other dancers that already know people, recommendations, and also maybe a workshop afternoon where [. . .] you just come and they hear about the project.

Dance instructor 53

Recruitment of girls

Some girls felt that the opportunity to try new activities, learn new dance styles and have some choice over this contributed towards their motivation to participate.

They said that at the beginning you'd get to choose a lot of what style you do.

Focus group 23

It was something new.

Focus group 62

For some, engagement centred on spending time with friends or encouragement from parents.

Because I could spend more time with my friends.

Focus group 62

I was telling my friend 'Shall we do it?' and she was like 'Oh I don't want to do it.' I was like 'It could be fun' and she was just, she decided to go.

Focus group 21

Well when I said that I wanted to quit Active7 she [mother] was like, it is healthy for you and you should think about going again and don't stop it.

Focus group 51

In two schools the £10 gift voucher reimbursement for completing data collection was interpreted as being related to attendance (even though it was explicitly stated that this was not the case). The absence of vouchers for data collection was predicted to affect sign-up for the project in future.

> *People signed up because of that [the voucher]. But I don't think they really signed up because they wanted to do the dance thing.*
>
> *Focus group 53*

Timetabling

The period between the end of school and the beginning of the sessions was short in some schools. This meant that girls struggled to arrive punctually, resulting in shorter sessions.

> *After school finished we started five minutes later. That was not enough time. They needed 10 minutes.*
>
> *Dance instructor 51*

Across all participant groups, a consensus emerged suggesting that the timetabling of sessions was not conducive to sustaining attendance, and arranging sessions at similar times to other after-school clubs had a detrimental affect on attendance.

> *There's obviously lots of other things that are offered to them in secondary school [. . .] I think those kind of things probably had a bit of an impact on it I think.*
>
> *School contact 53*

> *We had a few clubs at the same time a lot of the time, that's why I think some of the girls were a bit torn between what to go to.*
>
> *School contact 23*

The number and frequency of after-school activities led to a suggestion that the future dissemination of the project would benefit from running within school time (e.g. at lunchtime), as girls often wanted to leave immediately or to attend other after-school classes.

> *It could have done better if it was at lunchtime or something because you'd get to do like more things I think.*
>
> *Focus group 23*

Session quantity and duration

Two sessions per week was seen as burdensome, especially when other activities and commitments limited the time available for after-school events. Attending classes twice a week was considered a significant commitment for girls, thus contributing to decreasing attendance rates over the 40 sessions.

> *I think possibly the fact that it was twice a week was quite a big commitment.*
>
> *School contact 53*

> *Sometimes it was too much because of other things you had to do as well.*
>
> *Focus group 32*

> *They did brilliantly to commit but I think as they get older that commitment is – if it was to stay with two sessions a week – it would definitely dwindle away and float off.*
>
> *Dance instructor 23*

Future project design needs to consider the demands placed on girls. Indeed, several girls noted that the frequency of Active7 sessions was incompatible with school life. As such, a more targeted approach, in which only one session per week is delivered, would be beneficial in future. This may be conducive to increasing participation.

> *You'd have to take it down to once a week and I think that you'd get more attending that way.*
>
> *Dance Instructor 62*

> *Just one session per week; you get more attendance through that one session.*
>
> *School contact 72*

Three dance instructors suggested that if there was only one session per week, the session could be longer in duration.

> *I would do it for an hour and a half once a week. I think that's a good amount of time.*
>
> *Dance instructor 53*

Project duration

Discussions regarding the length of the project were largely critical. For example, all school contacts suggested that the length of the project made it hard to sustain attendance.

> *Possibly because it was . . . on for such a long time they found it really hard to maintain their commitment.*
>
> *School contact 72*

One solution was to implement the project in 5-week 'blocks', in which different dance styles are covered in respective modules.

> *They do things better in bite size . . . you'd have almost been better off breaking it down to five week projects and a meeting at the beginning of each one so everybody knew where they were.*
>
> *School contact 62*

This method was recommended in the initial design of the intervention and its use was encouraged among dance instructors. However, a more formal compartmentalisation of the intervention may ensure greater fidelity and potentially improve the experience that girls have.

Session content

This section relates to the combination of a number of subthemes that were concerned with the delivery of sessions, variety in session content, repetition, group work, dance diaries and behaviour.

Variety in session content

The intervention aimed to provide variety in session content by incorporating a number of dance styles and genres of music. This was perceived to be a significant component for maintaining interest, in particular, having choice over these elements, which the majority of dance instructors felt they provided.

> *[The dance instructor] asked us what types of things we wanted to do. Some people said contemporary, some people said breakdancing [. . .] so that's what we did, which was good.*
>
> *Focus group 53*

> *I'd ask them often, 'what style do you want to do?'.*
>
> *Dance instructor 21 and 51*

She was kind and she let us like put on the music that we wanted.

Focus group 42

The absence of choice is exemplified in the selection of dance styles by instructors. Some instructors were perceived to choose the styles without providing any choice.

She just said at the start of the term we're doing like different things, like she said street and then [dance style A].

Focus group 61

Repetition

Comments suggested that many girls did not enjoy sessions owing to the repetition of content. This was often caused by girls missing sessions and returning the following week, meaning that content had to be repeated to ensure that all girls were up to date.

They were saying 'Oh we're doing the same thing every week Miss'.

School contact 21

I just found it boring because we went over the same moves a hundred times.

Focus group 61

Long repetitive warm-ups were seen as boring.

We spent about half an hour just doing a warm up so we didn't get much time dancing [. . .] on one session I remember we did a warm up and then we ended up only doing the proper dance for about five minutes.

Focus group 72

It should be noted that a 'buddy' system was implemented to prevent repetition; 'buddies' were meant to pass on missed choreography and information to those who were absent. However, this appeared to be ineffective, as girls often failed to pass on the information.

The problem was not all our buddies we knew or we don't see that often or we don't see ever so it was kind of hard. And also if both of you missed it then you were a bit stuck.

Focus group 72

Group work

Generally, group work was viewed positively. Instructors felt that group work provided girls with choice and gave them ownership of the sessions. Girls also reported that they felt confident working in small groups.

When we did our own choreography in Thriller we were split into two groups and we had to show them. Then we were quite confident with ours.

Focus group 61

With tasks and things like that I kind of just gave them the choice in their groups, so they just kind of got on with that.

Dance instructor 32

I think when it came to choreography and teaching other people, that's when they took their ownership more so of the club I think.

Dance instructor 21 and 51

Group work helped girls to develop leadership skills and was perceived to be a useful strategy to help girls make new friends.

> *There's one girl in particular who's very talented at leading – like totally loves it. She's like 'everyone in a line right, right, now!' You know, she's really, she's properly on it, she loved it. So I really saw some of those skills develop.*
>
> *Dance instructor 61*

> *Buddying them up I think, you know, made new friends, that's something that's come out from the kids that they've made new friends over this time.*
>
> *Dance Instructor 72*

Allowing the girls to work in groups also helped instructors to cope with various levels of competence within the group.

> *During creative tasks, if one group had finished it really early because they were really competent at that particular task then I'd give them something else to sort of do afterwards.*
>
> *Dance instructor 32*

Some instructors allowed the girls to choose their own groups at the start of the project; they would then mix groups up once they felt comfortable with each other. The majority of instructors who discussed mixing friendship groups felt that it was successful and recommended this for the future delivery of projects.

> *The first sessions I normally – if I'm doing group work – let them go with who they want to go and then when they feel more confident I kind of change it up a bit so they get to know new people.*
>
> *Dance instructor 53*

Dance diaries

By reading and responding to girls' comments in the dance diaries, instructors were able to communicate with those who lacked the confidence to raise issues verbally. The diaries also gave the instructors an insight into how girls experienced the project.

> *They would write things in there, either about the session that would give me clues as to what . . . you know 'oh, I loved this game'. And you think 'oh, I didn't realise you loved this game, OK let's do this game more'. [. . .] That would influence what I did in the next session.*
>
> *Dance instructor 42*

However, in contrast to the dance instructors' views, girls' views of dance diaries were largely negative. Diaries were seen as boring and took up time that could have been used for dance.

> *I found it a bit annoying because I think we could have been doing more dances and maybe cooling down [. . .] sometimes I didn't know really what to say. It was like the same questions all over again . . . it was like a bit pointless really doing all the same questions.*
>
> *Focus group 32*

Girls appeared to be unaware of why they had to complete diaries. As such, it is important to clarify the use of diaries so that all girls are aware of why they are needed. One girl felt that a group discussion would make better use of the time set aside for filling out diaries.

> *Instead of doing the diaries I think we should have a talk time instead of writing it down because . . . does anyone look at our diaries?*
>
> *Focus group 32*

Behavioural difficulties and management techniques

Four school contacts referred to the 'high' standard of behaviour required at their school, which they expected to be upheld in Active7.

> *We're in quite a good school for behaviour so any behaviour issues do get sorted out very quickly and I wouldn't want for [dance instructor]'s view of the school to be damaged by one or two students.*
>
> *School contact 72*

In line with this, instructors in three schools thought that the girls were generally well behaved.

> *They were quite a chatty group, but they were also very respectful and really well behaved.*
>
> *Dance instructor 61*

However, there were various behavioural problems experienced across schools. Misbehaviour by fellow girls was described as annoying, a waste of time and leading to repetition of content.

> *Some people were wasting our time. They kept on jumping around and then the Active7 teacher was like 'oh, we need to do this' and then we really wanted to do it and wanted to get on with it. Then just wasted half an hour of their time doing nothing when they could have spent that half an hour learning the dance.*
>
> *Focus group 42*

Behavioural difficulties were reflected on as a product of the girls' age, the onset of hormonal changes and developing personalities.

> *I had lots of different personalities to cater for and at that point you've got a real split in the 'shyer', sort of geekier girls, and the more confident girls. There's a real personality shift at that age.*
>
> *Dance instructor 23*

One school contact school felt that the behaviour in the dance sessions did not align with the expectations of the school. In contrast to the views of the dance instructor, school contacts were critical of their own inability to instil the necessary levels of discipline.

> *The expectations we have on our PE lessons are very, very high in terms of behaviour and discipline [. . .] the expectations in terms of behaviour were very poor [in the Active7 sessions] and that was probably my fault for not explaining that more rigorously [. . .] had I been in the sessions more than I would have been able to control behaviour a lot more.*
>
> *School contact 42*

Dance instructors described various behaviour management techniques that could be used in future projects, including altering the tone of one's voice; trying to connect personally with individuals; going quiet or holding a pose to get the girls' attention; developing forfeits for certain behaviours; splitting feuding group members into different groups; and involving the school contacts in dealing with behavioural issues. Several instructors reported asking girls to write group guidelines in their dance diaries about the expectations within the group.

> *For noise level for example, I would stop talking myself, rather than raising my voice and getting angry at them.*
>
> *Dance instructor 21 and 51*

> *If they were talking when everyone else was talking and I'd say 'girls, can you stop talking because someone is contributing ideas and we said right at the start if someone is contributing ideas they must feel safe'.*
>
> *Dance instructor 23*

> *I was like 'come on girls, I think that she needs to buck her ideas up' and they were like 'yeah!' so she had to run to one side and jump and then run back and jump and they were like 'yeah!'.*
>
> *Dance instructor 21 and 51*

This participatory, collaborative method whereby dance instructors defined boundaries with regard to acceptable behaviour and language in sessions was useful. Similarly, the findings suggest that school contacts and dance instructors working together to deal with behavioural issues was effective. One instructor felt particularly supported by the school contact, who helped with behavioural problems.

> *If there was any behaviour I could deal with it, and I would let the teacher know and she would back me up so that's a negative turned positive.*
>
> *Dance instructor 72*

Project organisation

This section relates to ideas for improving attendance, session design and project organisation. The section is split into six subthemes: open enrolment, parental involvement, working towards end goals, cost, facilities and communication issues.

Open enrolment

All respondent groups suggested that 'open enrolment' would help to alleviate poor attendance. This would allow girls to 'drop in' to dance sessions at any time, rather than to sign up to the sessions at their onset. One school contact suggested that open enrolment would be beneficial for the future dissemination of the project.

> *So anyone can come along [. . .] If only three year sevens turn up we'll say 'right, you're challenge is next week you have to bring a partner'. And then when six turn up I say 'right, you have to bring a friend'. So that's how we kind of do it.*
>
> *School contact 42*

> *We always welcome people that, you know, come and join at any point [. . .] to participate, because you know that way we keep numbers up.*
>
> *School contact 51*

All respondent groups saw this as a possible strategy but noted that being mindful of new people joining and interrupting existing group dynamics and their progress is important. For dance instructors, this view was informed by their previous experiences of using a similar technique.

> *I think perhaps you might say 'you could join in after half term' or 'you can join in once we've finished this dance'.*
>
> *Dance instructor 62*

Parental involvement

Increasing awareness of the project among parents was seen as a way of improving retention rates. Comments suggest that parental awareness of the project was low, which may have led to the increased likelihood of girls skipping sessions.

> *Maybe just writing to the parents and when the kids stopped coming [. . .] For a number of reasons, because I think some of the girls that dropped out didn't tell their parents for a while that they'd dropped out and were just wandering around school . . .*
>
> *School contact 61*

> *Getting the parents involved through a parents' evening [. . .] get them to sign up to e-mails and therefore you could e-mail the parent when things are due in as well.*
>
> *School contact 42*

Dance instructors partly attributed attendance to parental encouragement across schools. One instructor thought that girls were motivated to attend because they had been told to attend by their parents.

> *I think their parents kind of told them to be there.*
>
> *Dance instructor 21 and 51*

The advantage of greater parental involvement was also outlined by some girls.

> *Your parents want to make you more active so they want you to go so they will encourage you.*
>
> *Focus group 42*

Cost

Participant groups expressed diverging views regarding the cost/payment of sessions. One school contact suggested that girls could contribute financially to the project in order to improve attendance (i.e. girls were more likely to drop out of free dance classes).

> *I think it would be nice to ask people to contribute financially towards it because that might cement attendance.*
>
> *School contact 42*

However, one interviewee suggested that payment for extracurricular activities is kept to a minimum in their school. Other contacts endorsed a view that payment for future sessions would not necessarily be beneficial for maintaining attendance, as fewer girls may sign up to the project.

> *We try and keep it [cost] as low as possible; a couple of pounds maximum.*
>
> *School contact 51*

> *If you've got ones that are dancing already and doing things then they'll probably turn around and say 'Well do I really need to do another dance class when I'm already paying for three or four or however many a week?'.*
>
> *School contact 32*

The potential implementation of payment for sessions needs to take account of the contextual circumstances of particular schools and to consider the implications of payment for classes on motivation to attend.

Facilities

The majority of girls appreciated that the dance sessions were on school premises because they did not have to walk far and the school was close to their home. When asked what made Active7 easy to attend, one girl replied: 'Because we didn't have to walk far' (Focus group 61).

> *If we had to change rooms every single time I think that would have been a bit harder but I like it how it was just in one room.*
>
> *Focus group 32*

On some occasions both instructors and girls noted problems associated with the facilities, including access to toilets and changing facilities, room temperature and ventilation, and, in one school, a teaching space that had a public gallery. Changing venue because of conflicting activities (e.g. exams) was also troublesome.

> *People used to stay here [viewing platform] after school and they used to come in and like start watching [. . .] So everyone would have stopped because they got embarrassed.*
>
> *Focus group 42*

> *[Having to move venue] was always really confusing because you'd sometimes lose some girls because they couldn't find you or you'd lose time faffing around trying to figure out what room you were in . . .*
>
> *Dance instructor 23*

> *Sometimes we get really hot and sweaty [. . .] Because it's a heated floor [. . .] And the door won't open. The door was shut. There are no windows in there.*
>
> *Focus group 62*

Communication and management issues

Most dance instructors felt that they had a good relationship with their respective school contact. On the whole, instructors described contacts as being supportive of the study. This was reflected in the help provided by the contacts during the study. For example, the majority of contacts responded quickly to e-mails, some helped to contact non-attending girls, others provided timetables for teaching spaces and some assisted with behavioural issues. Over half of the school contacts observed numerous dance sessions.

> *She was really supportive with the performance particularly.*
>
> *Dance instructor 23*

> *I possibly talked to [school contact name] about attendance [. . .] and she was very supportive and sent emails out to parents [. . .] after every holiday she would send out messages reminding them and that kind of thing which helped.*
>
> *Dance instructor 32*

> *I came to the first few just obviously as a part of our, sort of quality control kind of side of things [. . .] then, the odd occasional drop-in, if required.*
>
> *School contact 51*

One school contact felt that visiting sessions provided the opportunity to learn from the dance instructor.

> *I just go down a couple of Tuesdays and join in with [dance instructor] because she's quite a good teacher and it's always good to learn some new stuff.*
>
> *School contact 32*

> *She just sat in and took some notes and then joined in on other occasions.*
>
> *Dance instructor 32*

There were two instructors who did not feel that they had sufficient support from the school. This was largely attributed to poor communication at that school and unfamiliarity with the year group.

> *Often I'd like ask her to come in [sit in on sessions] and she wouldn't reply to my emails.*
>
> *Dance instructor 21*

> *She didn't know any of the year sevens [. . .] so that meant it was quite difficult for her to communicate with them.*
>
> *Dance instructor 53*

Summary

This chapter has reflected on the various issues associated with the implementation of BGDP and has highlighted some implications for the delivery of similar interventions in the future. It is hoped that the various recommendations will have utility in the design, implementation and success of future trials and after-school PA interventions in general. A summary of these recommendations can be found in *Table 47*.

Various methods of recruitment for each participant group are recommended (see *Recruitment*), reflecting the diversity of girls and their requirements. Research altruism represents a potential lever with which to encourage school contact involvement; in light of this, it may be worth dedicating more space to recruitment materials that highlight the academic need for and merit of the research. Future projects should ensure school contact familiarity with the girls, as this could ease issues surrounding increased workloads and teaching burdens. Recruiting dance instructors based on endorsements from other dance instructors and dance agencies was also recommended as a fruitful method of recruitment. It was useful to recruit multiple reserve instructors from different areas, as they can then provide necessary support over a wider geographical range. Targeting peer groups among the girls (to aid sign-up and maintain attendance), espousing the credentials of the project to instil a type of research 'privilege', and using vouchers sparingly were cited as sensible and realistic methods for recruiting girls.

Timetabling of sessions (see *Timetabling*) needs to consider other after-school activities and the requirements of girls. Such an approach would counter issues associated with projects overlapping with existing extracurricular activities. Session quantity and project duration (see *Session quantity and duration* and *Project duration*) were viewed as long, and a more targeted approach whereby only one session per week is delivered in 5-week 'blocks' was considered a sensible modification.

Given the significance of dance styles in influencing participation, it was suggested that future interventions should encourage participant 'choice' in dance styles (see *Session content*). This could be facilitated through a participatory approach, whereby girls are empowered to promote their ideas and suggestions in a way that supports their engagement with the project. Training dance instructors in dance styles with which they are unfamiliar is also encouraged, as qualitative findings suggested that instructors were not familiar with some styles and the methods for teaching them prior to the intervention. Furthermore, the repetition of content discussed above (see *Repetition*) was found to limit the enjoyment of sessions, and it is recommended that measures are installed to ensure that girls who miss classes are familiarised with missed content. This could include implementing a more rigorously applied 'buddy' system.

TABLE 47 Recommendations for the future dissemination of the trial

Issue	Recommendation
Recruitment	School contacts: familiarity with girls and willingness to participate
	Dance instructors: endorsements from dance instructors, schools, dance agencies
	Girls: target peer groups, espouse credentials of project, use vouchers sparingly
Timetabling	An awareness of after-school events, extracurricular activities and the requirements of girls (factor in time to reach sessions from previous classes) is needed in the future planning of projects
Session quantity and duration	Targeted approach with one session per week. Session duration extended to 90 minutes
Project duration	Delivered in 5-week blocks. Different dance styles implemented in each block
Dance styles	Provide girls with choice over dance styles
Repetition of content	Instil measures to ensure that absent girls are familiarised with missed content. Implement 'buddy' system more rigorously
Group work	Continue group work to increase ownership of project, help instructor to cope with variation in competence, develop leadership skills and assist with attendance
Dance diaries	Clarify use of and need for dance diaries
Behaviour	A participatory, collaborative method whereby dance instructors define boundaries regarding behaviour and language is useful. Maintaining communication and contact between dance instructors and school contacts is encouraged
Facilities	Respond to participants' concerns regarding facilities and breaks
Open enrolment	'Open enrolment' policy (a procedure that allows girls to 'drop in', rather than to sign up to the sessions at their onset) may help to alleviate attendance decline
Parental involvement	Greater contact between trial team and parents of girls may help attendance
Cost/payment	The potential implementation of future payment for sessions needs to consider the contextual circumstance of particular schools

As seen above (see *Group work*), group work is to be encouraged, as it enabled girls to feel like they had ownership of the project, helped the instructor to cope with various levels of competence within the group, developed girls' leadership skills and was helpful with inconsistent attendance. Owing to the lack of consensus regarding the use of diaries (see *Dance diaries*), future projects may wish to clarify why they are needed. A collaborative method whereby dance instructors define boundaries regarding acceptable behaviour and language in classes was seen to be useful for managing behaviour (see *Behavioural difficulties and management techniques*). Maintaining communication and contact between dance instructors and school contacts is encouraged, as is a positive support network among instructors (see *Communication and management issues*).

An open enrolment method (see *Open enrolment*), whereby girls can 'drop in' to sessions, was viewed as a potential modification to project organisation that would positively affect attendance. Although restricting the number of girls was a necessary trial design measure, it does not reflect usual educational practice. Increased contact between the trial team and parents – who were significant in directing attendance – was viewed as a sensible method for retention (see *Parental involvement*). This could be achieved via information workshops or the dissemination of information to parents. Implementing payment for sessions should be approached with caution.

Although it is often not possible for intervention designers to 'choose' facilities within schools, it was suggested that being able to respond to participant concerns regarding facilities and act upon them is useful (see *Facilities*). It is important to identify what the optimal and realistically available facilities will be and how these can be adapted for PA promotion. This is a salient finding, given the quantity of responses from girls who suggested that facility issues hindered their engagement with the intervention.

Conclusion

The data presented in this chapter have shown how future school-based PA interventions could learn from the BGDP experience. We have provided recommendations that may be of use in future after-school PA interventions. Although the findings provide evidence that after-school interventions have the potential to increase PA levels among adolescent girls, the qualitative data suggest that there is a need to tailor the design and implementation of sessions to individual schools.

Chapter 9 Discussion

Summary of findings

In this report we have outlined the results of the BGDP. As stated in *Chapter 1*, there was a strong rationale for developing dance-based after-school interventions for adolescent girls. Dance is a desirable activity for adolescent girls and, when delivered on the school site immediately after school, it can be an accessible activity. Offering dance sessions for free also avoids any financial barriers to participation. We therefore hypothesised that providing dance sessions would yield increases in girls' MVPA.

The main objective of the BGDP was to investigate how effective after-school dance sessions were at increasing the PA levels of Year 7 girls. Both intention-to-treat and per-protocol analyses found no evidence of a difference in weekday MVPA at T2 or T1 between those girls who were assigned to the intervention group and those assigned to the control group. However, an additional exploratory analysis discovered that the dance sessions did provide girls who attended with 4.6 minutes more of MVPA and 14.3 minutes more of light PA than on a day on which there were no dance sessions. At T2 evidence was found to support a difference in motivation scores (excluding autonomy need satisfaction and self-esteem) between groups, with higher scores among girls in the control group. The evidence followed a similar pattern at T1.

The good recruitment rate of schools (compared with the sample population) indicates that schools are keen to be involved in dance interventions, thus suggesting that dance is an appropriate activity for adolescent girls. Pupils and dance instructors were also interested in the study, as demonstrated in the strong pupil recruitment rates in schools and the willingness of local dance instructors to be involved. However, it is important to note that the girls who were recruited to the study were, relative to the wider population, an already active sample. Dance instructors found the intervention training and session-plan booklet to be useful resources and, on the whole, felt that they developed professionally as instructors as a result of this exposure. There is scope for the refinement of the intervention materials, in particular in terms of ensuring that the materials cater for wide-ranging skills and experience.

This study shows that it is possible to deliver a relatively long (6–7 months' duration) PA intervention within secondary schools in the after-school period. All intervention schools received at least 37 of the planned 40 intervention sessions (undelivered sessions were largely attributable to illness or competing school events). Many stakeholders felt, however, that the intervention period was too long to maintain interest and enthusiasm. A major consequence of this was seen in the declining attendance rates throughout intervention schools. Attendance was low at the start of the intervention and declined over time. Although this is common to many after-school activities, it does raise concerns about the potential of the after-school period for engaging children in long-term interventions. This may be an appropriate time at which to consider an increase in PA, as schools provide a setting in which all children can be reached. In addition, more attention may be required to encourage better attendance in future studies. This might be achieved through, for instance, more formalised agreements with schools or pupils.

Regarding the length of intervention sessions, views were more ambiguous. Many interview respondents felt that sessions were too long and that any future interventions should be reduced in length. This is similar to the feedback from our earlier pilot work,[38] which found 90-minute sessions to be too long, hence the reduction in session time in the current study. A similar issue emerged vis-à-vis the timing of sessions, with respondents expressing largely positive views on sessions beginning immediately after school

(as our pilot work suggested), but some maintaining that they needed more time to transition between school classes and the start of Active7 sessions. However, the end time of sessions was often considered too late, especially in winter months. Although the results were disappointing, with attendance and fidelity to the session-plan manual being lower than hoped, we feel that a modified after-school PA intervention does have the potential to increase interest in physical activities and improve child PA levels.

Active7 dance sessions were enjoyed by the girls who attended. The elements of the intervention that were disliked included having to readdress content because of pupil absences, disliking certain dance styles and having mixed views about performing to a group. The enjoyment data collected from girls suggest that when girls did attend, they had a good experience. This, combined with qualitative data, suggests that the reasons for girls missing sessions were not attributable to disliking the content. In fact, missing sessions was largely attributed to competing activities or responsibilities outside school (family and social commitments were often cited) that would impact upon any other commitments girls had. In addition, as the intervention period spanned a 6-month period, the commitments that girls had changed. The self-reported exertion data collected towards the end of the dance sessions indicate that girls did not find the sessions physically demanding. Although this is not entirely corroborated by the qualitative data, it is an issue that would need to be addressed in future interventions.

The dance intervention is likely to appeal to schools, as it is financially viable and can be delivered relatively cheaply. The average cost was £2401 per school, with an average of £73 per pupil over the 40 sessions (£1.83 per child per session). In a context in which schools purchase external provision for many after-school activities, the findings are likely to be appealing. Approximately 30 children can participate in an enjoyable activity all year round (indoor dance sessions are not affected by weather variations).

A summary of findings from the BGDP will be disseminated to a number of stakeholders after the main trial findings have been published. Head teachers and school contacts in all schools (intervention and control) will receive a letter summarising the trial findings (see *Appendices 9* and *10*). All girls who participated in the study will be given a 'thank you' postcard (see *Appendix 11*) and parents/guardians will receive a letter (see *Appendix 12*) summarising the study results. All schools will be sent a poster presenting the findings (see *Appendix 13*). We have included a list of local dance activities on our website, which have also been signposted on the dissemination materials (see www.bristol.ac.uk/sps/research/researchprojectpages/active7/dance/).

Interpretation

Physical activity interventions have been found to achieve small to negligible effects in children's PA, with some improvements to levels of MVPA.[36] Interventions targeted at increasing girls' PA in particular have had similarly small effects ($p < 0.001$).[13] Biddle *et al.*[13] have suggested that, although behaviour change is possible for female pre-adolescent populations, it is difficult. This conclusion was recently supported by Lubans *et al.*,[15] who also reported that an intervention did not increase PA levels of their adolescent sample. The present study recruited a relatively active sample of girls. Median baseline weekday MVPA was 49.15 (control) and 53.25 (intervention). This issue has been noted in several other studies that have found that active participants tend to sign up to PA interventions, thus indicating that the individuals most in need of the intervention – those with low PA levels – are not being recruited. This not only has the effect of 'missing' those individuals with low activity levels who are of primary public health concern but may also have a secondary effect of limiting any improvements in the MVPA levels of participants.

The effect of the BGDP intervention on MVPA can be seen as similar to effects reported in the wider literature. The only notable effect detected was for those who attended dance sessions while wearing an accelerometer at T1 (during the dance intervention). There was evidence of an increase in levels of light PA and MVPA on dance days compared with non-dance days for these girls. O'Neill *et al.*[27] also found increases ($p < 0.001$) in levels of light PA and MVPA on days on which children attended their dance sessions. Results are comparable to the GoGirlGo! study, in which 5- to 13-year-old children accumulated 11 minutes of MVPA on PA session days compared with 8 minutes of MVPA on non-activity days.[103]

As we found girls to be more active on the days on which they attended dance sessions, we suggest that the after-school sessions do not offset other PA but rather provide a new way in which girls can be active. An important point is that we were unable to detect the effect of the intervention on school travel mode throughout the intervention period. The T1 measures (which provided the accelerometer-assessed measure of PA during the intervention period) were taken during a summer month (with longer hours of daylight); research has found that independent mobility of children during winter months is somewhat lower than during summer months, suggesting that the girls had more options for travelling home from school.[104] In addition, although the findings suggest that sessions need to incorporate more opportunities for MVPA, it is important to note that the T1 measures were taken at a period in which most intervention schools were preparing routines to showcase. Thus, the content of sessions was likely to be focusing on the minutiae of dance sequences. This would result in increased amounts of light and sedentary activity than would be expected from a typical session. An additional factor that may have curtailed the effect of the intervention was the high baseline levels of MVPA in both trial arms (mean intervention group 53.25 minutes; control group 49.15 minutes). Other studies have found that increasing PA in an already active population is difficult.[39,105,106] In future, it is clear that the sessions need to incorporate higher levels of high-intensity PA in order to increase the MVPA levels of participants.

Contrary to much evidence,[43] Biddle *et al.*'s[13] meta-analysis found stronger effect sizes in atheoretical studies. Noting that this was not anticipated, the authors of the review contend that behaviour change interventions may be successful without a theoretical underpinning. The qualitative results presented above suggest that the participants received positive experiences of competence and greatly valued the autonomy granted to them during sessions. The type of choice that participants received in Active7 sessions can be seen to be largely that of the 'option' as opposed to 'action' variant.[100] Option choice relates more to issues such as music and dance move choice. Action choice, however, focuses more on progression and choice over the speed and complexity of tasks. As the latter variant may be more directly associated with PA levels, a greater focus on action choice would probably promote more self-determined and intrinsic motivation among participants,[100] which may have a greater effect on PA levels. A more detailed understanding of the type of choice granted could be explored in the lengthened training sessions that those delivering the intervention sought. As the intervention was not successful in increasing PA levels, we were unable to conduct mediation analyses that examined the effect of the principles of SDT in greater depth. The intervention did not have the expected effects of increasing intervention arm participants' perceptions of autonomous motivation or perceptions of psychological need satisfaction.

The findings suggest that those delivering the intervention adhered more to the theoretical underpinning of the study (SDT) than to the session-plan manual guiding the structure of sessions. Compared with other studies (with > 70% of delivered sessions only 'somewhat' or 'not at all' like the manual), the fidelity to the session-plan manual was low.[90,95] Ironically, this can again be interpreted as demonstrating a greater adherence to the theoretical underpinnings, whereby instructors were encouraged to provide choice and allow the girls to take ownership of the content of sessions. Although it appears contradictory that session-plan fidelity was low and theoretical fidelity high, we contend that this is not particularly surprising, as skilled and experienced dance instructors adapted sessions to suit the needs and wishes of the participants and attempted to provide choice for girls. However, theoretical fidelity was variable and a number of factors (e.g. behavioural issues, misinterpretation of the theory, using performance pieces and intervention drift) undermined delivery, which was consistent with an autonomy-supportive style. This said, instructors reported using many need-supportive teaching styles which were received as intended by the participants, and these ideas can be incorporated into future interventions.

The process evaluation found that several factors encouraged girls to participate in the study. The reasons for participation were largely social (making new friends and building existing relationships) and dance specific (learning new styles, trying something new). Developing social relationships was important for not only recruitment but also attendance and retention. This supports the contention that children are more likely to remain engaged in PA if they have good social ties within a given activity.[107,108] As reported by dance instructors, after the initial settling-in periods, a core group of participants who attended regularly remained, and these groups pivoted around strong social networks. In terms of the decline in attendance, the qualitative research is particularly insightful. Corroborating the views of the BGDP participants, who suggested reducing the overall length of the intervention period, research[13,34] has found that studies were more effective when the intervention period was short (< 12 weeks). A long intervention period was considered potentially boring and unsuitable to young people; again, this was a view supported by the focus groups and by interviews.

Similarly to the findings of previous research,[94,95] participants enjoyed the after-school sessions. Exposing girls to activities that they find enjoyable is crucial, as girls are more likely to participate in PA over the longer term if they find the activity enjoyable.[109] The high levels of enjoyment, combined with the largely extraneous reasons for not attending sessions, implies that the intervention was designed and delivered in an appropriate manner for the girls. If greater retention and consistent attendance can be achieved, the impact on MVPA could be significantly greater. The process evaluation highlighted some important factors that, if incorporated appropriately in future interventions, could maximise the relevance to the target audience.

The intervention was relatively inexpensive compared with similar PA interventions.[110,111] As such, dance-based after-school activities should be considered by school management as a way to enhance extra-curricular activities. The average cost per pupil was £73 for 40 sessions (range £68–77). Thus, if following the recommendation of reducing the length of the intervention period, the financial cost could be significantly less. As the intervention was not successful in achieving the primary or secondary outcomes, we cannot comment on the cost-effectiveness of the intervention. We found that the EQ-5D-Y was ineffective as a quality-of-life measure for the healthy child population in this study. We suggest that future research explores different quality-of-life measures for such populations.

Implications for future research

Dance appeals to girls and schools and is enjoyed by adolescent girls. It can be considered an effective means by which to initiate secondary school-aged girls' engagement in PA. Future research could test whether or not dividing the intervention into a series of smaller blocks (i.e. five sessions), each focusing on different dance styles, appeals more to participants and whether or not it can improve retention and attendance rates. Important findings from the process evaluation include: adopting an open-enrolment policy should be considered; behavioural guidelines should be collaboratively instigated by the intervention deliverer and participants; group work should be encouraged; greater theoretical fidelity through peer-to-peer support and a greater training provision should be facilitated; there should be a reduction in the repetition of content if children are absent (this would be eased by introducing 'blocks' of sessions), as well as a reduction in the overall intervention length and individual session length. Future studies may wish to better control delivery across schools to ensure that the intervention is delivered in a consistent manner across sites. *Table 48* provides details of some of the lessons learnt during the delivery of the BGDP intervention and offers potential solutions to increase the effectiveness of future interventions.

TABLE 48 Lessons learnt and recommendations for similar interventions

Element of intervention	Lesson learnt	Recommendations for future
Recruitment of (1) school contact, (2) dance instructors and (3) children	Contact may be pressured into participation and/or may not know participating children	Seek contacts who are interested in study and preferably know at least some of the target participants
	Ensure that deliverers can fulfil needs of school	Dance instructors must be able and willing to work with target population. They also have to be free at the times at which a school chooses to stage sessions
	Ensure clarity in the knowledge participants have in relation to what their participation entails	Explicitly relay information verbally and in writing for participants
	Recruiting peer groups may be effective	Targeting recruitment efforts at peer groups may improve attendance and retention rates
Communication between school contact and (1) pupils, (2) study team and (3) intervention deliverers	Poor communication leads to confusion over numerous negative issues	Recruit contacts who are keen to be involved in the study, rather than those who are pressured to participate. Provide detailed guidelines on the role of the contact and details regarding when things are required. But be cautious not to overburden contacts
Scheduling	After-school activities can clash with other activities and school closure days	A comprehensive calendar of activities and school closures should be obtained. The scheduling of sessions should work around identified activities
Frequency of sessions	Two sessions per week may be too demanding	Delivery of the intervention in themed blocks may be more desirable. Overall number of sessions should be thoughtfully considered
	A series of 40 sessions may be too long	
Session content	Participants enjoy group work	Embed group work into all sessions as it gives participants a sense of ownership over the sessions
	Ensure variety	Incorporate variety into sessions and allow participants the opportunity to make choices over content
Parental involvement	Parents play an important part in ensuring children's attendance	Developing strategies to engage parents and improve their awareness of interventions and study aims may improve child attendance

Strengths and limitations

This study has been a systematic and rigorous trial of a PA intervention in secondary schools. The study had sufficient statistical power to detect any effect on the primary and/or secondary outcomes. Rates of both school and girl recruitment were high, and there was excellent retention of girls to the study. All schools were retained to the study. We collected objective assessments of PA from participants at three time points, providing sufficient data to detect any long-term intervention effect. We also conducted an extensive process evaluation, which provided both qualitative and quantitative assessments of the intervention delivery and reception from a range of stakeholders. The intervention has been reported in accordance with the TIDieR framework and results have been reported in keeping with the CONSORT reporting guidelines (with the CONSORT flow diagram also reported; see *Figure 2*). As the study was free to attend and delivered in state schools, there was no financial barrier to participation (at the school or participant level). In addition, all girls able to participate in PE sessions were able to take part and there were no skill-specific prerequisites for participants.

The study was limited by the focus on one geographical region in the south-west of England. Participants were an already active sample. This issue not only affects the results of the study but is indicative of a wider problem with PA interventions, namely, that recruiting participants with low activity levels (arguably those most in need of an intervention) is difficult. The immediate effect of the intervention upon PA levels is largely limited to self-reported exertion levels and a one-off accelerometer assessment of those attending a session at T1 (the number providing data is low). An objective measure, such as heart rate monitoring, may have provided a more accurate reflection of within-session exertion levels. Anecdotal evidence from staff collecting data suggests that there was some degree of peer influence in the reporting of exertion levels and psychosocial questionnaire responses. We were largely unable to establish any intervention effect on school travel mode as girls were not asked about how they travel to and from school at any time point. As other research has suggested,[39] the high baseline levels of MVPA may indicate that the study appealed to an already highly active group of adolescent girls, and, therefore, those most in need of a PA intervention did not sign up.

Our qualitative data and informal conversations with dance instructors delivering the intervention suggest that those involved in delivering sessions received a number of benefits. A peer-support network was established as a result of the instructors' engagement in the study. The largely unanticipated positive effect on the local dance instructor network is a significant impact of the study, but no objective data were recorded to capture this effect. Future studies may seek to assess the impact on those delivering the intervention more rigorously. A more sustainable approach to improving PA opportunities may be through the upskilling of teaching staff (as opposed to hiring external providers), so that schools can deliver dance activities themselves. For present purposes, this was not feasible owing to the cost and expertise necessary for the dance-specific training that would have been required.

Chapter 10 Conclusions

Physical activity is important for a number of health and social reasons. Levels of PA decline as children get older, and this trend is worse for girls than for boys. There is a need to find effective PA interventions that help to increase the levels of MVPA achieved by girls. The evidence presented in this report demonstrates that dance is an appropriate form of PA for both schools and girls; however, it was not found to have any effect on levels of MVPA. Attendance levels were disappointing and declined throughout the course of the intervention. In addition, fidelity to the session-plan manual was low but theoretical fidelity was high.

The aim of the BGDP cluster RCT was to test whether or not a dance-based PA intervention could improve levels of MVPA among adolescent girls. The intervention had no effect on the primary or secondary accelerometer-derived PA outcomes. An economic evaluation was conducted, which showed that the provision of after-school dance sessions is a financially viable option for schools. The intervention was relatively inexpensive to deliver but it was not cost-effective, as there was no positive intervention effect. The study found that the EQ-5D-Y was unresponsive to change in the sample population. In addition, our detailed process evaluation found that girls enjoy dance sessions and that participants can develop a wide range of psychosocial benefits from participation. We provide rich contextual data that may be incorporated into future interventions to improve their effectiveness.

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Russell Jago (Professor of Paediatric Physical Activity and Public Health) was the principal investigator on the grant funding the work, and **Simon J Sebire** (Senior Lecturer in Psychology of Physical Activity/ Exercise), **Ashley R Cooper** (Professor of Physical Activity and Public Health) and **Jane E Powell** (Professor of Public Health Economics) were coapplicants.

Russell Jago, **Mark J Edwards** (Research Associate, Trial Manager), **Kathryn Banfield** (Research Assistant, Physical Activity Interventions among Youth) and **Thomas May** (Research Assistant, Qualitative Research) wrote the first draft of the monograph.

Simon J Sebire and **Joanna M Kesten** (Research Associate, Qualitative Research) were responsible for the process evaluation and completed first drafts of the process evaluation results chapters. **Joanna M Kesten** collected all process evaluation data. **Russell Jago**, **Mark J Edwards**, **Simon J Sebire**, **Joanna M Kesten** and **Thomas May** analysed the qualitative process evaluation data. **Ashley R Cooper** provided input into the design and conduct of the study, and critically reviewed and edited the monograph.

Emma L Bird (Senior Lecturer in Public Health) and **Jane E Powell** were responsible for the economic evaluation design and analysis.

Keeley Tomkinson (Research Assistant in Medical Statistics) and **Peter S Blair** (Reader in Medical Statistics) led the statistical analysis and reporting of the trial, and served as the main links to the Bristol Randomised Trials Collaboration, a UKCRC-Registered Clinical Trials Unit.

All authors made contributions to sections of the report and critical comments on drafts of the monograph and approved the final submission.

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Data sharing statement

All available data can be obtained from the corresponding author.

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Appendix 1 Excerpts from the 'Guide for dance instructors'

Dance styles and genres

The programme is designed with the expectation that four dance styles will be covered during the 20 weeks, or three if this is more appropriate for the participants and/or contexts. The styles chosen need to appeal to 11-12 year olds and they should be sufficiently accessible whilst providing the necessary challenges and variety to keep the girls motivated and interested. Some **examples** of dance genres and styles are provided in the table below.

Bhangra	Fitness styles: e.g. Zumba	Modern/Theatre
Break-dance	Freestyle	Musical Theatre/Cabaret
Capoeira	Hip-hop	Rock n' Roll
Charleston	Latin American or Salsa	Street
Contemporary	Lindy Hop	Swing

It is open to Dance Instructors to select the dance styles most appropriate for their sessions, in consultation with the girls as appropriate. However, it is suggested that Dance Style 1 looks at some aspects of **Street Dance** as this was popular during the pilot phase of the project and the music and movement can 'hook' the girls into the programme. If **Contemporary** was chosen as Dance Style 2, then these sessions would introduce additional skills to those studied in Style 1 but remain relevant: e.g. falling into and out of the floor, different types of jumping, sliding, fluid movement, contact work. Style 3 should again add something new for the participants but remain relevant - this is often achieved through choice of music. **Musical theatre/'Glee'**style performances are popular at present and could provide a further hook for the girls.

Performance 'mash ups' can explore one or more genres fused together. Weeks 26 to 30 can always revisit Style 1 or 2 if the girls wish. The programme can and should be fitted to the type of student and their interests but widen their dance understanding to at least 3 styles of dance from a range of genres.

Session Numbers	Aims	Page 9 has a non-exhaustive list of possible styles: -
1 to 5	Introduction, setting of expectations & instructor-led class to set pace, standards and behavioural codes To learn the key features of a dance style Developing ability to refine movement skills To work with others on simple tasks	Teaching and exploration of Dance Style 1 – instructor to reinforce behaviour and expectations throughout Gradual building of pupils confidence, involvement, response, and physical skill Perhaps start with more popular style of street dance
6 to 10	Teaching of steps and sequences from another dance style Develop pupils' confidence in offering own ideas Gradually increase stamina & strengthening tasks	Teaching/exploration of Dance Style 2 e.g. Musical Theatre/Jazz Incorporation of stamina-building sections into sessions Creative tasks to feature throughout to aid ownership, involvement and skill development
11 to 17	The consolidation of skills learned so far Creation of dance piece using the two styles of dance studied so far Greater demand on physical activity through refining, and rehearsal	Mix It Up Through creation of dance piece building stamina and strength Inclusion of episodes focussed upon higher levels of physical activity Instructor to assess most successful styles, steps, pupils and create piece to exploit these.
18 to 20	Development of rehearsal and performance skills including musicality, focus, dynamic emphasis and projection	Rehearsal, Performance or Sharing opportunities Development of self-confidence and self-esteem
21 to 25	Exploration of a third dance style Development of physical skills Exploration of choreographic devices	Dance Style 3 –this may include more partner work now pupils are used to each other, demanding trust and co-ordination Further development of pupil voice through choreography
26 to 30	Exploration of fourth dance style Further development of compositional understanding	Dance Style 4 OR this could return to the most successful style OR one of the choice of the participants indicated early. Further development of performance skills in relation to a different dance style.
32 to 38	Creation of final dance piece – could be a culmination of all dance styles or those favoured by the pupils	Mash It Up This period may result in one or two dances put together

		encompassing all / some of the dance styles viewed.
39 to 40	Refinement of performance skills Final performances and feedback	Rehearsal, Performance or Sharing Opportunities

Session 1: Establishing expectations, having fun but maintaining a focussed and hard-working atmosphere, with praise. DANCE STYLE ONE

It is important that dance style ONE is a style that is most relevant to the pupils and acts as a 'hook' for them as well as being accessible e.g. street dance styles. Partner work can/could come later when they are more comfortable with each other etc…

It would help the session instructor to have a member of the school teaching team in the room at the beginning of this session to aid familiarisation of the space and resources for the instructor, and also provide another point of reference for the pupils. It is also important that the school knows who is taking part in the programme and ensure that reception/parents are aware these pupils are staying behind after school.

INSTRUCTOR: ensure you make some individual connection/positive inclusion and comment/praise to all at some point during the session.

Time	**Activity** *Check girls have been to the toilet*	**Teaching points & Strategies**	**ABCs**
To be spent on each activity	*Instructor: 1) Prepare space and resources, (2) Have music playing quietly as pupils enter, (3) Interact with pupils as they arrive* *PUPILS Arriving and settling time – this time is to allow them to adapt from school mode into 'outside school hours' setting*	*Session leader to set up all resources and be aware of where changing facilities/water/toilets are. Pupils will arrive most probably at different times. The session will commence 10 or 15 minutes after the end of the school day dependent upon school.*	
5	Welcome and introduction by instructor - - introduce yourself and explain it is great to see them all - take an attendance register - ask if they attended the taster session	- Use of first name of session instructor to establish difference between 'in-school' and 'out-of-school' activity - Instructor should try to learn names throughout when interacting with pupils etc… - Give out T-shirts to be worn with pride and reminder to all that	B

	- establish if any of them have danced before *Name badges may/may not be utilised – instructor to decide? If so – here they should be given a badge and should write name on. The instructor should make one too*	they should be worn each lesson (could be done at end of session)	
4	Explain aims of the programme - - 20 weeks of dance, learning street and other popular dance styles *(instructors may only want to give one or two styles here and keep the others as a surprise for later in the programme)*, working towards learning short and longer dance pieces incorporating everyone – aiming to give a performance to perhaps friends and family at points throughout the programme. *Examples can be given here from the success of the previous girls in their performances in the last programme delivered.* - acquisition of dance skills: physical ability, confidence, understanding of music and performance - develop their own ideas and create themselves in small groups - aim to share their work and give performances – but not compulsory - have a lot of fun and enjoy making new friends whilst improving their dance skills as a team		A
3	Explain aims of the session - - get to know each other and their instructor - make an attempt to dance in time with each other and the music chosen - to warm up & learn a dance sequence to improve their dance skills - to learn some key aspects of dance style you have chosen		
1	Ask if anyone has any injuries or medical needs	Asthma users should have inhalers in the room *(as the programme progresses this can happen at the commencement of the session etc.)*	
15	Warm up and getting to know one another – 1. Stand in a circle – not standing by anyone they know 2. Circle game – action/name association movement. Instructor to provide some examples using her own name and then show how the game will progress. 3. Q = Why warm up before we take part in dance?	The circle game will help pupils get to know each other, break the ice and enable instructor to learn names as well as gain an insight into the motivations/response of the pupils. A = So we don't get injured, to prepare our brains/bodies etc…	C

	4. Structured movement based warm-up – instructor-led – to incorporate: - Pulse and inner core temperature raising activities - Mobilisation of joints and structure - Brief stretching of major muscle groups	MUSIC needs to be upbeat, popular to get pupils moving & feeling at ease – this may be a continuum of similar tempos It is imperative the warm-up provides sufficient intensity to increase the girls' heart rate	
20	*Ask/help organise pupils into lines – dependent upon space – decide how many to each row etc.* Teaching of set material (section A) through COMMAND – perhaps 4 x 8 counts – including repetition of some movement or all phrases on other side etc...to aid memory and enhance participation Incorporate terminology from the specific dance style being taught Rotate lines throughout this task to ensure all have equal access and are recognised by instructor	Movement must be accessible to ALL to ensure everyone can access the music and succeed from the outset. Instructor to assess if movement is pitched at right level and must react accordingly if it is not Teaching strategies: - clear demonstration by instructor using imagery to help understanding - doing without/with music, giving steps names, singing rhythms - progressively building routine through repetition & layering - adding some further elements to think about for those more able - instructor interaction through moving in space and asking questions	
8	Rehearse learned sequence with music – 2-3 times: incorporating the following steps to this to aid variety & development - Instructor doing with them & giving vocal instruction also - Ask pupils to choose ONE action/pose which they will put on the end of sequence and hold for 3 seconds - Only vocal reminders	The instructor may decide to give further assistance if/when needed – dependent upon progression.	

2	Feedback – congratulations upon their energy, performance, doing something specific which has been discussed earlier Challenge them to perform 'without' you!	Instructor response will have much impact upon the pupils and aid retention Challenge them to build atmosphere, achievement and self-esteem	
5	Cool-down – lower heart rate gradually, incorporate stretches to main muscle groups to aid flexibility enhancement Incorporate some simple terminology to aid knowledge	Health and safety, develop flexibility and awareness of this and ensure participants leave from a safe environment and reduce possibility of aching tomorrow.	
4	Performance to you – give positive feedback to all – can be reward for the simplest of accomplishments as all starting from varying levels, ability and experience.	Try to include those you have not individually addressed during the session if this has occurred.	
8	Plenary:- Explain & hand out dance diaries – tick/complete Q – How do you think you will use your dance diary? Q – What elements of today's session have you enjoyed the most? Q – What do you like about this dance style? *Pupils can write down their responses in their diaries*	Instructor to explain ways to use the dance diaries –they can draw / write the dance, say what they enjoyed / were good at...write names of new friends etc... Instructor needs to extract responses from different pupils.	
	Urge them to rehearse, dismiss, see you next session etc...	Ensure pupils have all belongings, dance diaries etc...	

Notes...

Session 22: Further exploration of new dance style or extension of previous dance style			**DANCE STYLE 3**
Time	**Activity**	**Teaching points & Strategies**	**ABCs**
10	*Set up resources/space*	*10 minutes to get out of 'school day mode'….*	
4	Welcome pupils, tick diaries. Take feedback from the questions regarding what they have liked so far, what they might like to try etc. *(Explain clearly that*	Congratulate all girls for reaching session 22 - keep up the good work!	

	there is still a programme to follow and you have already designed what you would like them to do but there may be room to accommodate their wishes etc.)		
1	Aims: Working together to explore this dance style and work together to improve each other's skills. Learn some more skills linked to this dance style.		
15	Warm-up – varied, perhaps this session the warm-up could be a building exercise. You start then they add in movement ideas – these can pull from what they have done before or be something they have learned in school etc.	By working collectively and asking for their input this should enforce all the new skills and knowledge they have acquired. Try to maintain everyone keeping moving but perhaps call out individual girl's names and ask them to do something which then everyone copies etc.... Include all if possible.	A B C
3	Q. What dance style did we begin to explore last session? Q. What were some of the movements we learned? As someone gives an answer – get all to practise the movement(s).	Try to tease out information – they can explain, show you etc. If they are confident you may select them, or put them into pairs to discuss and remember – work to the needs of the group.	C
20	Teach a choreographed sequence linking the style back to the movement just practised and/or learned last session	Dependent upon content this may be solo, duo etc... It should have jump, turn, travel, balances, gestures in (basic dance vocabulary).	
5	Practise this with music and begin to feed in knowledge relating to posture and alignment – use of centre and control. Perform again applying this new awareness/challenge	Try to feed in how different dance styles require the muscles to work in different ways which affect the posture, hold and alignment of the body (gives	

		examples from all dance styles to aid this).	
2	Ask the pupils to select 3 of the features from the last session to insert – you could have a group vote for the 'top 3' steps etc...	They had time earlier in the session to reflect so this should be recalled fairly easily.	
5	Choreograph these movements into the taught sequence from this session.	Beginning, Middle, End or all in one part – using TRANSITIONS – ask them for suggestions...	
10	Set up a challenge scenario by splitting into two groups – assigning a 'Rehearsal Director' to each group and rehearsing to the music. ½ watches ½ then discuss successes and improvements. All then perform together aiming to work on one identified improvement – then feedback another improvement and they perform all together again. Ensure that physical activity is kept high for all pupils and that time spent inactive is minimal.	It is important that you split the groups accordingly – personalities should be thought about and the instructor will know the group well. The instructor needs to be well informed to do this strategically and successfully. ONE improvement should be identified first then rehearsed, then another, so they are clearly isolated and hopefully remembered.	A B C
8	Cool Down – continuing the new varied content - perhaps Yoga etc. is also now being used, try to get the pupils to pronounce the names.	Devise new ways to keep this alive and relevant – perhaps include some Yoga, Pilates etc... – *place this in context etc...*	
3	Plenary Q. Who can give me a movement from each of the dance styles we have chosen? Show me? Ask others to identify similarities and differences? Explain next week we will look at more physical skills and take more risks.		

Notes...

Session 40: Celebrating our success: Final Performance **Performance Project TWO: Mash It Up**

This plan is a guide only and circumstances, context and timings leading up to the performance may vary. It is important that, depending on when and where the performance is, correct arrangements have been made by the dance instructors with the school/parents/pupils etc… This session is designed to include the performance. It may be that IF the performance is being held later in the day (to allow parents and friends to attend), the session could commence later, with details left to the discretion of the dance instructor and school.
It is also important to take into consideration any girls not performing: they should be integral to this – they can help backstage cue music etc…

Time	Activity	Teaching points & Strategies	
10	*Prepare space and resources*	*10 minutes to get out of 'school day mode'….*	
10	Welcome – collect diaries and chat with pupils. Time could be spent here summing up their programme and recording some thoughts about how they feel knowing they will be performing to family and friends (as appropriate).	Tick diaries with them all sat around. Have a look at how pupils have used their dairies and share some of the good work if appropriate. *If needed, check if another space is available for the girls to change later whilst family/friends arrive etc….*	
2	Explain aims of the session: - Rehearse the dance, identifying what they need to do to give a superb performance and work as a team - Walk through the spacing and practise more difficult parts - Prepare for the performance		
5		Check if there are any injuries…	
10	Warm-up - not an exhaustive one due to the nature of the session but to prepare them and reduce risk of injury.		
15	Walk through the dance section by section. Rehearse the dance section by section with the appropriate music.	Throughout this prompt pupils to remind you of what they need to do as regards spacing, formations, timing, choreographic devices etc.	C
?	Rehearse the dance x 1 with music – from beginning to end. After this prompt pupils to recall good features of performance Rehearse the dance x 1 with music	e.g. lifted focus, facial expression, projection, musicality and enjoyment. Draw out ways they can improve upon these…	

?	Sit the pupils down and give a 'pep' talk which motivates them, gets them feeling positive and increases their confidence.		
?		Ensure the seating, staging and music systems are all set up,	
?	As appropriate, family/friends arrive. Welcome & performance		
?	Congratulate dancers and ensure all the girls have diaries etc. Encourage them to keep dancing and say farewell.		

Notes…

Suggestions of ways for taking into consideration instructor and/or pupils preferences:

Sessions:			
1 – 5	Dance Style One	Dance Style One	Dance Style One
6 – 10	Dance Style Two	Dance Style Two	Dance Style Two
11 – 20	Performance Mix	Performance Mix	Performance Mix
21 – 25	Dance Style Three	Dance Style 1 extended	Dance Style Three
26 – 30	Dance Style Four	Dance Style 2 extended	DS 1,2 or 3 extended
31 - 40	Performance Mash	Performance Mash	Performance Mash

There is room to tailor the programme and this must be planned in if anything is not suitable for the instructor due to skill base or pupils' interest/suitability/preference/engagement. Diagnostic assessments on this can and should be made throughout the first 10 sessions.

Appendix 2 Excerpts from the 'dance diary'

Active7

Active7 promise

As an Active 7 girl I, ..., will do my best to:

My notes

This is *MY* space to be creative and write what I feel about the dance club, or doodle about my experiences.

DOI: 10.3310/phr04060

My notes

This is *MY* space to be creative and write what I feel about the dance club, or doodle about my experiences.

This dance diary is for me to:

* make notes in each session about what I have learned
* give me ideas of what I can practise
* illustrate how I feel about dancing (in words or pictures)
* write down any thoughts or ideas that I have about the dancing
* keep a record of the number of dance sessions that I've taken part in

What I want to get from Active7:

(This can be anything from things you want to learn to improving on things you have already tried.)

*
*
*
*

Week 1

Session 1 — (date):	Session 2 — (date):
The thing I enjoyed most about today's session was…	In today's dancing session the coolest thing I learned was...
Some things I would like to practise more between now and the next session are:	To help me remember everything I have learned for next time, I will ...

Week 2

Session 3 — (date):	Session 4 — (date):
3 words that best describe my session today are: 1) 2) 3)	In today's session the thing I found most difficult was… The thing that I found most easy was...

Week 19

Session 37— (date):	Session 38— (date):
I enjoy dance because... Out of all the steps I have learned so far, the ones I enjoy most are…	Today's dancing session made me feel…

Week 20

Session 39 — (date):	Session 40 —
In the final session I would like to…	This was my last session and it made me feel: The 3 best things about the dance club for me were: 1) 2) 3) Because of the dance club, from now on I will...

Appendix 3 Child focus group guide

TABLE 49 Child focus group guide

Section	Questions	Timings
Introduction	Explain purpose of the interview: *The reason we want to talk to you is because we think that you will be able to help us improve Active7 for the future and we value your opinions. We are going to talk about your experience of taking part in Active7 and your views on promoting Active7 to other schools* Explain audio-recording and data storage procedures: *Before we get started, I'd like to tell you that I will be recording the conversation. The recording is to help us remember what we talked about. You can ask for the recording to be stopped at any time. The recording will be written up and we will remove any personal information like names, place names, school names, etc. At this point the audio files will be deleted; so none of the information that is written down and recorded can be connected to you in any way* Explain group guidelines and confidentiality: *We have got some group guidelines for us all to follow.* [Display and read out guidelines]. *Lastly, we want everyone to be able to talk freely so it is important that everything that is said today stays in this room. This means that what is said is confidential* Answer any questions and commence audio-recording	2–3 minutes
Icebreaker	*Can we go round the group one at a time and say our name and a word or two to describe what it was like being part of Active7? I'll go first – Jo and exciting*	≈ 1 minute
Barriers and facilitators of participation	*Now I'd like us to start by finishing off some sentences. I will go through each sentence and I'd like you to individually write down how you would finish the sentence on these Post-it®* [3M, Maplewood, MN, USA] *notes and stick it onto the question. If you have more than one way to finish the sentence you can write another Post-it note. We will then discuss each answer in more detail:* I enjoyed or liked being part of Active7 because . . . I did not enjoy or like being part of Active7 because . . . I found it easy to come to Active7 sessions because . . . I found it difficult to come to Active7 sessions because . . . More in-depth exploration of the above: X can you tell me a little bit more about why you enjoyed/did not enjoy Y? Does anyone agree/disagree with X? X can you tell me a little bit more about why you found it easy to come to the Active7 sessions because of Y? Does anyone agree/disagree with X?	≈ 7 minutes

continued

TABLE 49 Child focus group guide (*continued*)

Section	Questions	Timings
	Specific examples of success stories or challenges	
	Prompts (in case the following are not covered in the Post-it note task):	
	What did everyone think about X?	
	Did anyone like/dislike X?	
	Cost (did this make it easier to attend?)	
	Dance styles	
	Opportunity to perform	
	Types of music	
	Dance diaries	
	Days on which Active7 ran	
	Activities/events which affected sessions (e.g. school camp, other clubs, sports days, etc.)	
	Number of sessions each week	
	Length of sessions	
Session experiences	Relatedness	≈ 7 minutes
	Did you all know each other before you started the dance sessions?	
	Did your relationships with one another change as the weeks went on?	
	Was everyone supportive of each other?	
	Specific examples of success stories or challenges	
	Competence	
	How did you find the dance sessions physically (e.g. did they make you feel hot, sweaty or out of breath)?	
	Prompt:	
	Did the sessions become easier (physically) over time?	
	How difficult or complicated did you find the dance steps or routines?	
	Prompt:	
	Did the sessions feel like they became less complicated over time?	
	What do you think you have learnt (if anything) from being part of Active7?	
	Prompts:	
	New/improved dance skills?	
	What can you do now that you could not do before?	
	Change in amount of PA?	
	Change in confidence?	

TABLE 49 Child focus group guide (*continued*)

Section	Questions	Timings
	Specific examples of success stories or challenges	
	Attendance	
	How would you describe the attendance (number of people who came to the sessions) at the dance sessions (e.g. high, low, variable)?	
	Did it change over the 20 weeks?	
	Do you have any idea why attendance was like it was?	
	Why do you think some girls stopped coming to Active7?	
	(For those girls who continued to attend) How did it make you feel as the numbers declined?	
Dance instructor	Overall impressions	≈ 10 minutes
	What did you think about your dance instructor in general? Why?	
	Is there anything you would change about your dance instructor's teaching style? If yes, what?	
	Did your instructor give you choices (e.g. dance steps, music, choreographing own routines)?	
	What did you think about being given choice?	
	What did you think of the creative tasks (where you were allowed to make up your own sections of dance) throughout the sessions?	
	Do you think you had some control over what you did?	
	Specific examples of success stories or challenges	
	Prompts:	
	Things liked/liked less	
	Things liked less:	
	Why do you think the instructor may have done X,Y or Z, e.g., making injured people join in/refusing water breaks. Can you think of any reason why she did that?	
	Is this different in other classes they go to? If so, how? If not, why do they think/want Active7 to be different?	
	Teaching style (e.g. encouraging/motivational/enthusiastic/good knowledge of dance/left pupils out/went too fast/too slow/made it too hard/did not know our names/was not interested in us)	
Signposting	What did you think of the information we gave to you about local dance opportunities (e.g. helpful)?	2–3 minutes
	Is anyone thinking of starting a new dance class now that Active7 has finished?	
	Has anybody already started a new dance class?	
	Did your dance teacher advise you on other local dance sessions/clubs in the area?	

continued

TABLE 49 Child focus group guide (*continued*)

Section	Questions	Timings
Dissemination (creative or sorting task)	Introduction *We are thinking about doing Active7 again in more schools. After the last 20 weeks, you are now experts in what it is like to be a part of Active7 so the last part of our discussion will look at how we might improve Active7 for other girls your age. Using the Post-it notes from the first task I'd like you to work together to put them in order of importance, (so what's the most important thing to you about Active7, what is the main reason you come along, etc.). And as we do this task I'd like us to talk about how we could change the more negative things or improve the positive things if we did the project in more schools* [THIS WAS USED TWICE AND SUBSEQUENTLY THE FOLLOWING TEXT WAS USED]: *After the last 20 weeks you are now experts in what it's like to be part of Active7 so what I'd like to know is what you would change or what you think we should change if we were to do the project again?* **Cost** If we were to run the programme again would you be willing to pay to attend? How much would you be willing to pay? Prompt: £5 per week (two sessions) and then £1 per session For example: *'For number 1 you have chosen . . .'* Fun (interviewer probe: '*how could we make it more fun if we did this project again?'*) Making up own routines (interviewer probe: '*what is it about making up routines that you particularly enjoyed?'*)	≈ 10 minutes
Closing	Thank the participants *That's all the questions I have for you today. You have helped me a lot and we will use your input to improve Active7 in the future* Provide opportunity for participants to add any additional information *Before we finish could we go round the group and each say one thing that could help improve Active7 in the future?* Provide opportunity for participants to ask questions *Do you have any questions for me?* *Thank you very much for your time and attention. I appreciate you sharing your thoughts and opinions with me!*	2–3 minutes

Appendix 4 Dance instructor interview guide

TABLE 50 Dance instructor interview

Section	Questions	Timings
Introduction	Explain purpose of the interview • Understand experiences of delivering the Active7 dance sessions • Discuss elements of Active7 that worked well • Identify potential improvements to the project • Discuss factors that might affect how we take the Active7 project from here and run it on a larger scale Explain audio-recording and data storage procedures: *Before we get started, I'd like to tell you that I will be recording the conversation to help us remember what we discussed. You can ask for the recording to be stopped at any time. After the interview, the recording will be written up and we will remove any identifiable information like names, place names, school names, etc. At this point the audio files will be deleted, so none of the information that is written down and recorded can be connected to you in any way* Position interviewee as the experts of their experience: *There are no right or wrong answers. We are trying to understand your views on how the Active7 project worked, after all you are the expert! Please be as honest as possible* Answer any questions Complete consent form Commence audio-recording	2–3 minutes
Icebreaker	*To start us thinking about your involvement in Active7 can you tell me what attracted you to the Active7 project?*	≈ 1 minute

Instructor induction day (stress that this is concerned with only the intervention induction not the taster induction)	Overall impressions
	
	• Did the December induction day prepare you adequately to deliver the Active7 sessions?
	• How did you find working with the other dance instructors? Were you able to make any new connections as a result of working on the project?
	• Were there any elements of the induction session that could have been improved?
	
	Prompts:
	
	• Length of time
	• Structure
	
	  ○ Balance of theory (SDT and evaluation description) and practical
	  ○ Would you have liked more role play for dealing with difficult situations?
		≈ 7 minutes

Booster session	• How did you find the April booster session? • Did you change anything as a result of the booster session?	≈ 2 minutes

continued

TABLE 50 Dance instructor interview (*continued*)

Section	Questions	Timings
Dance session delivery	Session-plan manual (use session plans as a prompt) • What did you think of the session plans in the manual? Prompt: Things liked/liked less/improvements • How did you use the session-plan manual? Prompt: Did you adapt the session plans? Examples? • Were you able to adapt the session plans to the girls' ability/ differentiate depending on girls ability? If so, how? • Do you think the manual could be improved in any way? Session delivery • Could you give me an example of a particular success story you had in working with the girls in your school? • Can you give an example of where delivery was challenging? Prompts: • Length of the sessions • Number of pupils per class • Suitability of the dance space • Rooms being double booked/occupied for exams • What did you think of the number of sessions per week? • What dance styles did you cover? • How comfortable/confident did you feel teaching the different dance styles? • How did you decide on the dance styles you used? Covered sessions • Did you need to cancel or find cover for any of your sessions? If yes, • How did this process work (i.e. what did you have to do)? • How well do you think the process of covering sessions worked? • How did the girls react to having a session covered by someone else? • Did you cover any sessions in other schools? • If yes, how did you find covering another instructor's session? • How did the girls react to having a session covered by someone else?	≈ 20 minutes

TABLE 50 Dance instructor interview (*continued*)

Section	Questions	Timings
	Active7 handover (237 and 238 only) • How did the process of handing the sessions over to X work? • Do you think this process went smoothly? • Is there any way we could make this transition smoother if the project was carried out in more schools on a larger scale? **SDT** At the induction Simon presented some ideas about motivation and how to motivate the girls, including supporting their choice and ownership, sense of belonging and sense of improved skills Overall • Were you able to include any of the motivational ideas that we included in the manual and induction day into the Active7 sessions you delivered? How? And were they useful? (use manual as prompt) • How similar do you think these motivational ideas were to your own delivery/instruction style? • What did you do in order to try and sustain the pupils' engagement in dance and PA? • Did you see the girls' motivation change throughout the course of the sessions (e.g. did their reasons for coming seem to change)? Autonomy • Were you able to offer children choices during the Active7 sessions? How? If challenging – why? • Did the girls have a sense of ownership over the dance sessions? How did they respond to this? • Can you give an example of where supporting the girls' choice and ownership was challenging? Relatedness • What was your relationship with the girls like? Did it change? How? • Can you give me an example of this relationship? • How did the girls get on as a group? Were they supportive of each other? Example? • Did they clash? Example? • Did you see the group evolve over time? Competence • How do you think the girls views of their dance ability changed? • How did you deal with the varied level of skill that the girls had? Can you tell me about a particular example of a challenge a girl had? How did you try to help them overcome this challenge?	

TABLE 50 Dance instructor interview (*continued*)

Section	Questions	Timings

Pupils response to intervention	• How did the girls respond to:
	  ○ Twice-weekly lessons
	  ○ Length of sessions
	  ○ Dance styles/skills
	  ○ Performance opportunity
	• Do you think the girls feel different about being active now, compared with when the sessions started? Example?
	• Did you see any personality or physical changes in the girls over the course of the intervention?
	• Did you see any change in the girls in relation to:
	  ○ Confidence/self-perceptions
	  ○ Have you heard things from teachers/parents about any spill-over effects Active7 has had on the girls outside the sessions (e.g. academics)?
	  ○ What more information/support could the Active7 team provide to maintain and or increase participation once the intervention has finished?
	• Did you experience any behavioural issues? Examples?
	• What impact did these behavioural issues have on the sessions/ other girls?
	• What coping strategies did you use to cope with behavioural issues?
	• How effective do you think these coping strategies were? Examples?
	• How useful were the behavioural guidelines (use manual as prompt)? Examples?
	• How supportive was the school contact when behavioural issues arose? Examples?
	Attendance and dropout
	• What did you think of the level of attendance at the dance sessions? Expected/unexpected?
	If attendance was low:
	• Do you have any feel for why attendance may have been low/high?
	Prompt:
	• Was attendance affected by other events/activities such as school camp, other clubs, sports day, etc.?
	• Did you have any girls drop out? Reasons?
		5–10 minutes

TABLE 50 Dance instructor interview (*continued*)

Section	Questions	Timings
Rollout of the programme	Introduction *At the end of the project we may consider running Active7 on a larger scale, for example in more schools around the country. On a larger scale instructors would still receive the training and booster sessions and this would likely be run by experts in local areas* General • Do you think running this project on a larger scale would work? Yes/no? Ask for reasons • How would the instructor training work best (it could be the same as it is now but run by a different local expert)? • How can we attract the best dance instructors in different areas? Extending the programme length: The current programme was aimed at Year 7 girls and was limited to 40 sessions • What changes would be needed to keep the girls interested beyond the 40 sessions – perhaps when the girls have moved into Year 8? • What strategies do you use to motivate girls to continue attending dance sessions in classes you run elsewhere? Open enrolment In the study we had to limit who could participate to the girls who provided consent and data when we first visited schools (September/October 2013) • If this programme were to run outside of a research context would you allow girls to join once the programme had started? If so, would you allow girls to join at any time or only at set landmarks, such as the start of a term? Previous after-school experience: • Have you run after-school dance sessions before? If so, are there any lessons that you could bring from those experiences that could be used to improve the Active7 after-school programme? • In other work you have done in schools, who paid for your time? School, council, arts charity or the parents? If the parents what was the cost per child per session? Views on payment • Was the per-session payment you received in-line with what you are used to? • Would you be less likely to attend a training/induction session if you did not receive payment?	≈ 10 minutes

continued

TABLE 50 Dance instructor interview (*continued*)

Section	Questions	Timings
Communication	School communication • How did you find working within your school? • Did you have much contact with the school? • Did you find the school supportive? • Could you give me an example of a particular success story you had in working with your school? • Can you give an example of where working with your school was challenging? • Was there anything that could have been done by project staff to improve the relationship you had with the school? Active7 team communication • How did you find working with the study team throughout the project? Prompts: Resolving any issues/problems that arose • How did you find being involved with the evaluation measures/visits from the research team? Prompts: Frequency of visits Prompts: Impact on teaching from instructor observations and child completed questionnaires	≈ 5 minutes
Closing	Finally, is there anything that we have not discussed today that you think could have been done to improve the Active7 intervention? Thank participant Provide opportunity for participant to add any additional information That's all the questions I have for you today Is there anything else you'd like to tell us about the things we talked about today or the four week programme? Provide opportunity for participant to ask questions Do you have any questions for me?	2–3 minutes

Appendix 5 School contact interview guide

TABLE 51 School contact interview guide

Section	Questions	Timings
Introduction	Explain purpose of the interview • Discuss elements of the intervention that worked well • Potential improvements • Factors that might affect how we take the Active7 project from here and run it on a larger scale Explain audio-recording and data storage procedures *Before we get started, I'd like to tell you that I will be recording the conversation to help us remember what we discussed. You can ask for the recording to be stopped at any time. The recording will be written up and we will remove any identifying information (names, place names, school names, etc.). At this point the audio files will be deleted; so none of the information that is written down and recorded can be connected to you in any way* Answer any questions Complete consent form Commence audio-recording	2–3 minutes
Background/icebreaker questions	• What is your role within the school? • How did you come to be involved in Active7? • What was the incentive for you to participate? • How involved have you been (e.g. what did your role as the contact involve, etc.)?	2 minutes
Communication	Communication with dance instructor (School 23 ask in relation to both instructors) • What involvements with the dance instructor(s) did you have? • How did you find working with the dance instructor throughout the programme? • How could communication with the dance instructor have been improved? Prompts: • Resolving any issues/problems which arose in relation to the dance project (e.g. arranging the dance sessions) Communication with study team • How did you find working with Mark and the other Active7 team throughout the programme? • How could working with the study team be improved? Prompts: Resolving any issues/problems which arose in relation to the research or dance sessions (e.g. arranging data collection visits)	≈ 5 minutes

continued

TABLE 51 School contact interview guide (*continued*)

Section	Questions	Timings

Logistical issues	General
	
	• Logistically, how did you find Active7 ran in your school?
	• Were there any issues or problems? If yes, what type of issues or problems arose?
	
	  ○ Are these problems common to other extracurricular activities?
	  ○ Potential improvements which could have resolved these problems?
	
	• Were there any behavioural issues related to Active7?
	• What did you think of the level of attendance at the dance sessions?
	
	Prompts:
	
	• Expected/unexpected?
	• Do you have any feel for what factors may have contributed towards the level of attendance?
	• Was attendance affected by other events/activities such as school camp, other clubs, sports day, etc.?
	• How could attendance have been increased?
	• What did you think about the length of the sessions (1.25 hours)?
	• What did you think about the number of sessions per week (two per week)?
	• Were there any problems with room bookings?
	
	Specific examples of success stories or challenges
	
	Questions for school contact in School 23 (where two instructors were used)
	
	• How did you feel about having a new instructor?
	• How did the process of handing the sessions over to X work?
	• Could this process be improved?
	• Do you think having more than one instructor deliver the project could work if the project was rolled out?
	• Looking back is there anything the Active7 team could have done to help hand over the sessions between the instructors?
	
	Data collection
	
	• What were your experiences of the data collection process? (Arranging and the actual process of collecting data from the girls)
	• How could the process of data collection be improved?
	
	Specific examples of success stories or challenges
		≈ 10 minutes

Impact	• What impact do you think the dance programme had on the girls taking part (e.g. physical, dance-specific, socially)?
	
	  ○ Did they seem excited by it?
	  ○ Was there a difference in their behaviour/confidence during the project?
	
	Specific examples of success stories or challenges
		≈ 2 minutes

Sustainability	What information/support could we provide to maintain or increase dance participation now the dance sessions have finished?	1–2 minutes

TABLE 51 School contact interview guide (*continued*)

Section	Questions	Timings
Rollout of programme	Introduction *At the end of the project we may consider running Active7 on a larger scale, for example in more schools around the country. The difference between Active7 now and the rolled out project is that there would not be any research components, for example we would not need to do data collection and it would be run by a not-for-profit company not researchers* General • Do you think running this project on a larger scale would work? Yes/no? Ask for reasons • Would there be any school barriers/facilitators for a larger rollout? Extending the programme length: The current programme was aimed at Year 7 girls and was limited to 40 sessions • What changes would be needed to keep the girls interested beyond the 40 sessions – perhaps when the girls move into Year 8? • What strategies do you use to motivate girls to continue attending optional after-school activities? Open enrolment In the study we had to limit who could participate to the 33 girls who provided consent and data when we first visited schools (September/October 2013) • If the programme was run outside of a research context would instructors be allowed to add new pupils into their sessions if they drop out? • If so, how would this work (e.g. reserve list)? • Would you allow girls to join at any time or only at set landmarks, such as the start of a term? • Does this happen in other extracurricular activities in your school? Logistics • If Active7 was not part of a research project, how would the girls be recruited? Prompt: • By the school only or would the taster session be useful? • How would you usually recruit to extracurricular activities? Cost • In other after-school activities you have in your schools, who pays for the instructors time? School, council, arts charity or the parents? If the parents what was the cost per child per session? • If there was no focus on measuring PA, would this make a difference to recruitment of girls? • Would your school be willing to offer Active7 again? • Is your school planning to continue offering after-school dance next term? If not, why not? • Who would be the best person to approach in school about a larger project? • Which year group would you recommend we target with this larger project? • Is a dance project for other years needed for Active7 to feed into? • Would the involvement with the school contact be less or more in a larger project?	≈ 10 minutes

continued

TABLE 51 School contact interview guide (*continued*)

Section	Questions	Timings
Closing	Thank participant • Thank you so much for taking the time to speak to me and for your help co-ordinating Active7 so far Provide opportunity for participant to add any additional information • Those are all the questions I have for you today • Is there anything else you would like to tell me about the things we talked about today? Provide opportunity for participant to ask questions • Do you have any questions for me?	1–2 minutes

Appendix 6 Convergence coding matrix

TABLE 52 Convergence coding matrix

Code	Agreement	Partial agreement	Silence	Dissonance
Initial involvement				✗
Data collection		✗		
Reasons for involvement		✗		
Anxiety about delivering sessions			✗	
Training provision			✗	
Manual			✗	
Communication	✗			
Dance styles		✗	✗	
Repetition of content	✗			
Music	✗		✗	
Warm-ups		✗	✗	
Behavioural issues		✗		
Undermining dance instructor		✗		
Burden of study especially time			✗	
Knowing children	✗		✗	
Group work	✗		✗	
Complexity of dance				✗
Performance		✗		
Toilet and drinks breaks		✗	✗	
Dance diaries and attendance records				✗
Day of the week		✗		
Timing of the sessions		✗		
Two sessions per week	✗			
Length of project	✗			
Length of session		✗		
Cost of classes	✗			
Views on instructors			✗	
More than one instructor	✗			
Attendance	✗			
Decision-making process			✗	
Autonomy	✗			
Instructor autonomy support				✗
Choice		✗		
Being controlled		✗		

continued

TABLE 52 Convergence coding matrix (*continued*)

Code	Agreement	Partial agreement	Silence	Dissonance
Relatedness		✗		
Relational support		✗	✗	
Competence	✗			
Competence support		✗		
Identified motivation			✗	✗
Integrated motivation			✗	
Intrinsic motivation	✗		✗	
External motivation		✗	✗	
Introjected motivation			✗	✗
Information about local clubs	✗		✗	
Reaching girls who need projects like Active7/disengaged with other activities		✗		
Benefits of the intervention		✗		
Plans to continue dancing		✗	✗	
Future dance provision			✗	
Facilities		✗		
Session design				
Two sessions per week	✗			
Length of session		✗		
Dance information booklets		✗	✗	
No idea			✗	
Toilet and drinks breaks			✗	
Open enrolment		✗		
Multiple instructors	✗			
Targeting project to certain groups of children	✗		✗	
Willingness to participate again			✗	
More parental involvement	✗		✗	
Working towards end goal/performance opportunities	✗			
Not supportive			✗	
Payment			✗	
Recruiting dance instructors			✗	
Time of year			✗	
Cost per session	✗			
Training			✗	
Demographic characteristics	✗		✗	
Educational needs of children			✗	

TABLE 52 Convergence coding matrix (*continued*)

Code	Agreement	Partial agreement	Silence	Dissonance
Expectations or rules of school			✗	
Project aligns with school objectives			✗	
Teaching environment		✗		
Timetabling			✗	
Level and type of previous experience of dance instructors			✗	
School timings		✗		
School security			✗	
Separate tutor groups within schools	✗			

Note
Agreement means that codes from more than one data set agree; partial agreement refers to agreement between some but not all data sets; silence refers to codes that are found in one data set but not others; dissonance refers to disagreement between data sets (e.g. meaning and salience).

Appendix 7 Trustworthiness of qualitative data

TABLE 53 Description of how the research addressed each feature of the trustworthiness criteria

Trustworthiness feature	Description
Credibility (internal validity)	A sense of familiarity and rapport between the researcher conducting the interviews (JK), dance instructors and girls was developed through four visits to each school. By observing the dance sessions, an understanding of their content and delivery was established, which was used to inform the development of the interview guides. The researcher's familiarity with girls potentially facilitated a rapport between researcher and participant. Random selection of focus group girls based on levels of attendance minimised researcher bias and ensured the representation of a range of engagement levels with the project. All dance instructors and school contacts were interviewed, thus eliciting views from every intervention school. During the analysis, frequent debriefing meetings between study team members helped to ensure that different interpretations of the data were considered
Transferability (external validity) and dependability (reliability)	The ability to achieve the same findings or generalise findings to another setting is difficult to demonstrate in qualitative research. This research acknowledges that the findings should be understood within the study context. However, if similar findings were elicited in different school settings, this could demonstrate a degree of transferability. The in-depth details of methods employed ensure that the study is repeatable even if the same findings cannot be reproduced
Confirmability (objectivity)	The researchers (JK, SS, TM, ME) attempted to ensure that the findings were focused on the experiences of the girls rather than their predispositions. SS developed the project alongside the principal investigator and uses SDT in his research. JK attended four dance sessions within each school and became familiar with each school setting and with the instructors. Therefore, this may have influenced her interpretation of qualitative information elicited during the research. In contrast, TM did not perform any school visits and does not have a background in SDT research. Therefore, he was able to take a more neutral perspective, assuming a role of checking that interpretations were supported by the data. By providing a detailed methodological description readers are encouraged to decide how far the findings can be accepted

Appendix 8 Summary of qualitative assessment of fidelity to self-determination theory and improvements

TABLE 54 Summary of qualitative assessment of fidelity to SDT and improvements

Variable	Summary of fidelity	Example quotation	Suggested improvements
Autonomy	Autonomy support was provided in all schools in the form of choice	*It was good us choosing what we could do, we'd be like more energetic because we knew the song* — *Focus group 42*	
	Choice was not always positively experienced. This was the case when girls did not feel competent to have control, were unaware of what was expected of them, or when choice resulted in conflicts between girls	*We were just sort of like left to do things on our own and like hardly no one knew what to do* — *Focus group 21*	Instructors should ensure that the provision of choice is appropriate to the level of competence, gradually increasing the level of independence as the project continues
	In two schools (72 and 32), the instructors were not seen as autonomy supportive	*We had no say in pretty much anything* — *Focus group 32*	Instructors could be encouraged to ask the girls for feedback on how much autonomy support they are experiencing
Being controlled	Examples of feeling controlled, whereby the girls' needs and feelings were ignored by the instructor, included when the provision of choice was either absent or not experienced as genuine. One instructor was perceived to be 'strict' and taught in a controlling manner	*She was asking us to choose a dance and then she'd choose a dance herself* — *Focus group 21* *She was strict because she wanted you to be dedicated [. . .]* — *Focus group 53*	The training of instructors should emphasise the difference between insincere and genuine choice as well as provide opportunities to practise offering choice in group settings
Competence	The instructors generally provided appropriate competence support and encouraged the girls to be self-reflective. Girls' confidence and competence to dance increased	*If you were stuck on something she would show you how to do it* — *Focus group 23*	
	In two schools (72 and 32), the girls felt a lack of support when learning complex skills and did not feel as though the instructor was aware of the group's competence level	*She just saw that some people could do it so she thought 'Oh everyone must be able to do it'* — *Focus group 72*	Instructors should be encouraged to apply greater differentiation in their teaching to ensure that the competence of the entire group is supported. Similarly, instructors could be encouraged to ask if anyone needs help

continued

TABLE 54 Summary of qualitative assessment of fidelity to SDT and improvements (*continued*)

Variable	Summary of fidelity	Example quotation	Suggested improvements
Relatedness	Instructors adopted strategies to create trusting relationships with and between girls	*If we were upset she would help us [. . .] [name of dance instructor] would be like 'right, we're going to dance this out' 'we're going to come on, and dance', just . . . or get them to apologise* *Focus group 42*	
	A minority of instructors were perceived to lack empathy when girls were unable to attend sessions	*apparently homework wasn't a good enough excuse [to miss sessions] because we had other days to do that* *Focus group 72*	Instructors should try to praise reattendance and avoid punishment. Class size could be reduced to support feelings of relatedness

Appendix 9 Dissemination letter for intervention schools

Active7

University of BRISTOL

Dear [head teacher name],

Between 2013 and 2014 your school took part in the National Institute for Health Research funded study, Active7, run by the University of Bristol. Active7 was a dance-based study for Year 7 girls, examining whether dance could help to increase the physical activity levels of girls.

Many girls become less active as they move to and progress through secondary school. Often the activities available to them are not of interest, so they disengage. To improve the health of adolescent girls, it is important to find activities which they enjoy. Dance is one such activity. Following a successful pilot study in 2011 Active7 focused on providing after-school dance for Year 7 girls.

Your school was one of nine intervention schools. You received 40 after-school dance sessions for Year 7 girls (delivered by expert dance instructors). The main finding was that girls who received the dance programme were not more active than girls in the control group at the end of the study. Girls from the intervention and control groups were already relatively active prior to engaging with Active7, obtaining an average of 53 and 49 minutes of weekday physical activity respectively. This could explain why changes in physical activity caused by Active7 were minimal. Unfortunately attendance also declined over time, with only one third of girls in all schools attending two thirds of the sessions delivered.

The project was financially affordable. Whilst participation was free for schools and girls, we recorded all expenditure. Each session cost £1.57 per child. Or, for two 75 minute dance sessions per week between January and June, the total cost was £2401 per school.

The nine intervention schools delivered at least 37 of the 40 planned sessions. This indicates that staging dance sessions within the school schedule is manageable. The study had a number of positive effects on participants. Girls reported enjoying Active7. Sessions were found to improve girls' sense of confidence and competence in dance. Participation also provided opportunities for girls to take ownership of sessions and develop their team working and leadership skills. Girls also commented on how Active7 introduced them to new styles of dance and provided opportunities to make friends and develop relationships.

The project taught us some important lessons about running effective after-school projects, including:

- Dance is an *enjoyable* and *affordable* after-school activity.
- Girls like choice in their physical activity (dance style and music choice was enjoyed).
- *Girls loved the opportunity to take ownership of elements of the dance sessions.*
- 'Open enrolment', where participants can 'drop in' to sessions (rather than having to attend a whole series), may improve retention.
- Having one session per week (instead of two) may increase attendance.
- Breaking a course of physical activity sessions into themed blocks (such as five sessions on street dance, five on contemporary) may enthuse participants.

We would like to thank you for taking part in Active7, and hope that you will consider dance as a potential extra-curricular activity in future.

Yours sincerely,

[Active7 Trial Manager]

NHS National Institute for Health Research

The project is funded by the National Institute for Health Research Public Health Research (NIHR PHR) Programme (project number 11/3050/01).

Appendix 10 Dissemination letter for control schools

Active7

University of BRISTOL

Dear [head teacher name],

Between 2013 and 2014 your school took part in the National Institute for Health Research funded study, Active7, which was run by the University of Bristol. Active7 was a dance-based study for Year 7 girls, examining whether dance could help to increase the physical activity levels of girls.

Many girls become less active as they move to and progress through secondary school. Often the activities available to them are not of interest, so they disengage. To improve the health of adolescent girls, it is important to find activities which they enjoy. Dance is one such activity. Following a successful pilot study in 2011 Active7 focused on providing after-school dance for Year 7 girls.

Your school was a 'control' school, for which it received a £500 thank you donation. Schools acting as 'intervention' schools received 40 after-school dance sessions for Year 7 girls (delivered by expert dance instructors). The main finding was that girls who received the dance programme were not more active than girls in the control group at the end of the study. Girls from the intervention and control groups were already relatively active prior to engaging with Active7, obtaining an average of 53 and 49 minutes of weekday physical activity respectively. This could explain why changes in physical activity caused by Active7 were minimal. Unfortunately attendance also declined over time, with only one third of girls in all schools attending two thirds of the sessions delivered.

The project was financially affordable. Whilst participation was free for schools and girls, we recorded all expenditure. Each session cost £1.57 per child. Or, for two 75 minute dance sessions per week between January and June, the total cost was £2401 per school.

The nine intervention schools delivered at least 37 of the 40 planned sessions. This indicates that staging dance sessions within the school schedule is manageable. The study had a number of positive effects on participants. Girls reported enjoying Active7. Sessions were found to improve girls' sense of confidence and competence in dance. Participation also provided opportunities for girls to take ownership of sessions and develop their team working and leadership skills. Girls also commented on how Active7 introduced them to new styles of dance and provided opportunities to make friends and develop relationships.

The project taught us some important lessons about running effective after-school projects, including:

- Dance is an *enjoyable* and *affordable* after-school activity
- Girls like choice in their physical activity (dance style and music choice was enjoyed)
- *Girls loved the opportunity to take ownership of elements of the dance sessions*
- 'Open enrolment', where participants can 'drop in' to sessions (rather than having to attend a whole series), may improve retention.
- Having one session per week (instead of two) may increase attendance
- Breaking a course of physical activity sessions into themed blocks (such as five sessions on street dance, five on contemporary) may enthuse participants

We understand that not receiving the intervention can be disappointing, but having control schools is a crucial scientific element of our research. We are very grateful for the part your school played.

Yours sincerely,

[Active7 Trial Manager]

NHS
National Institute for Health Research

The project is funded by the National Institute for Health Research Public Health Research (NIHR PHR) Programme (project number 11/3050/01).

Appendix 11 Dissemination postcard for Active7 girls


Active 7
wants to
THANK YOU!
Go ahead and DANCE!
If you would like to find out about joining a dance class near you please visit our website for more info -
www.active-7.org
University of BRISTOL
Bristol Randomised Trials Collaboration
NHS
National Institute for Health Research
This project was funded by the National Institute for Health Research [Public Health Research Programme] (project number 11/3050/01)

- For those who regularly attended Active7, you slightly **increased** your daily physical activity levels. You said that you **enjoyed** the sessions and had **fun!**

- Being physically active is important! Did you know that just **60 minutes** of activity that leaves you slightly breathless and sweaty a day, can make a real difference to your health?

- We hope you enjoyed being part of the **Active7 story.** Your support is vital to our research so...

THANK YOU!

University of BRISTOL

Appendix 12 Dissemination letter for parents

Active7

University of BRISTOL

Dear Parent,

Between 2013 and 2014 your daughter took part in a National Institute for Health Research funded study called Active7 (run by the University of Bristol). Active7 was a dance-based study for Year 7 girls, examining whether dance could increase physical activity levels. The project is now complete.

Why did we run Active7?

Government guidelines recommend that children do at least 60 minutes of activity that leaves them slightly out of breath and slightly sweaty (moderate-to-vigorous physical activity) each day.

Many girls become less active as they move from primary to secondary school. Often the physical activities available do not interest them. To improve the health of this group it is important to find activities which they enjoy. Dance is one such activity and following a successful pilot study in 2011, Active7 focused on providing after-school dance for Year 7 girls.

What did Active7 show us?

571 girls took part in the study from 18 secondary schools. Nine schools received a series of after-school dance sessions that ran twice a week for 20 weeks. The other schools continued as normal (control group).

At the end of the project, the activity levels of girls who received the dance sessions were not different to those who did not (the control group). This means that the dance sessions did not increase the physical activity of the girls who took part. Whilst on the surface this is not what we hoped for, we have gathered lots of information about how the project was experienced. This can be used to improve our research and promote physical activity in future:

- Girls enjoyed the dance sessions.
- Girls who attended had higher physical activity levels on the days they attended compared to when they did not (around 15 minutes more light activity and 4.5 minutes more moderate-to-vigorous activity).
- Sessions provided opportunities to make friends, develop team work and leadership skills, and take ownership over activities.
- Some girls felt that they were better dancers, more confident and fitter as a result of the programme. The dance teachers agreed.
- Girls like choice in their activity and value choosing dance styles and music.
- Dance can be an affordable after-school activity (and it is not affected by the weather!)
- Attendance was low. Of the girls taking part in dance sessions only one third regularly attended. Whilst girls enjoyed the sessions, their attendance was impacted by other commitments.
- Feedback suggested it would have been better to run just one session per week.

Thank you for allowing your daughter's involvement in Active7 – supporting our research makes a real difference.

Yours sincerely,

[Active7 Trial Manager]

NHS
National Institute for Health Research

The project is funded by the National Institute for Health Research Public Health Research (NIHR PHR) Programme (project number 11/3050/01).

Appendix 13 Dissemination poster for schools

Active7

Go ahead and DANCE!

If you would like to find out about joining a dance class near you please visit our website for more info - www.active-7.org

Here is your Active7 story - thank you for making it happen!

How did we do it?

571 girls from 18 schools took part. 9 schools had two after-school dance sessions a week for 20 weeks.

3 is the magic number!

We used ***3 ways*** to measure the effect of Active7:

- we took your ***height and weight***
- we measured how active you were using an ***accelerometer***
- we gave you a ***questionnaire*** that asked how you felt about being active...

...all of this happened ***3 times.***

These are the 3 main things we found out:

- ***Everyone who joined in the dance sessions enjoyed themselves*** including; feeling healthier, taking ownership over sessions, developing team work and leadership skills, learning new styles of dance, making new friends and developing your existing relationships.
- ***There was little difference in physical activity levels between those of you that did, and those of you that didn't, take part in dance sessions.*** Those of you taking part in dance sessions were doing an average of 53 minutes of activity on weekdays and those of you who weren't, were still doing 49 minutes a day on average. This perhaps explains why the change in physical activity levels was so small!
- ***Around one in three of you who took part in the dance sessions attended regularly.*** For those that did, dance helped to increase your physical activity levels by almost 5 minutes a day (compared to days when there were no dance sessions).

3 things we have learnt:

- ***We need to find ways to improve attendance*** - allowing girls to join at any time and giving you a choice in activities could help with this.
- ***Your parents have a big influence on your physical activity.*** Gaining their support in future is important.
- ***Dance clubs are affordable,*** did you know it only cost £1.57 per session (but we paid for this)?

"It's like another fun activity you can do with your friends."

"...the sessions were actually really good and I enjoyed them..."

3 things to remember:

Be active
Be healthy
Have fun!

You should be active (slightly out of breath and sweaty) for at least 60 minutes a day...

that's only 4% of your whole week!

University of BRISTOL

Bristol Randomised Trials Collaboration

NHS National Institute for Health Research

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