

A randomized controlled feasibility trial exploring partnered ballroom dancing for people with Parkinson's disease

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Abstract

Objective: To determine the feasibility of a Dance Centre delivering a programme of mixed dances to people with Parkinson's and identify suitable outcomes for a future definitive trial.

Design: A two-group randomized controlled feasibility trial.

Methods: People with Parkinson's were randomized to a control or experimental group (ratio 15:35), alongside usual care. In addition, participants in the experimental group danced with a partner for one hour, twice-a-week for 10 weeks; professional dance teachers led the classes and field-notes were kept. Control-group participants were given dance class vouchers at the end of the study. Blinded assessments of balance, mobility and function were completed in the home. Qualitative interviews were conducted with a subsample to explore the acceptability of dance.

Results: A total of 51 people with Parkinson's (25 male) with Hoehn and Yahr scores of 1–3 and mean age of 71 years (range 49–85 years), were recruited to the study. Dance partners were of similar age (mean 68, range 56–91 years). Feasibility findings focused on recruitment (target achieved); retention (five people dropped out of dancing); outcome measures (three measures were considered feasible, changes were recommended). Proposed sample size for a Phase III trial, based on the 6-minute walk test at six months was 220. Participants described dance as extremely enjoyable and the instructors were skilled in instilling confidence and motivation. The main organizational challenges for a future trial were transport and identifying suitable dance partners.

Conclusion: We have demonstrated the feasibility of conducting the study through a Dance Centre and recommend a Phase III trial.

Keywords

Parkinson's disease, ballroom and Latin dancing, balance, posture

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Introduction

People with Parkinson's frequently have problems with mobility, posture and decreased quality of life. Self-help and engagement in physical leisure activities are two interventions being developed to try and overcome these problems. Furthermore, it has been shown that people with Parkinson's are interested in dance, and findings by Hackney and Earhart suggest a positive effect on balance and gait following Argentine Tango classes.¹

At the start of the current study, published findings were limited to studies with small sample sizes or small numbers in each group, averaging fewer than 20 participants. More recently there have been larger studies showing that dance, usually Argentine Tango, can be delivered for people with Parkinson's, generally in the research environment, and demonstrated some positive influence on balance and gait.² One-hour sessions, twice weekly for 10 weeks were recommended as an appropriate dose.² Two meta-analyses identified the need for well-designed randomized controlled trials and qualitative studies of the dance experience,^{3,4} as the methodological quality of previous studies and the trials included in the reviews were considered poor, leading to risk of bias with lack of details on the blinding and monitoring of interventions. A more recent meta-analysis⁵ of Argentine Tango found 13 studies met the inclusion criteria and reported significant effects for disease severity, balance and gait. The limitations cited were small study sizes and that most studies came from one research group (Hackney and Earhart) and recommendations were made for larger trials, with a focus on quality of life, social networks and long-term effects.

The aim of our study was to explore the feasibility of (a) using a Dance Centre to deliver a mixed dance programme for people with Parkinson's, (b) exploring participant experience, (c) examining the appropriateness of our primary and secondary outcome measures, which will be incorporated into the planning of a larger phase III trial to address the efficacy question.

Methods

The published protocol⁶ details the procedures adopted in this two-group randomized controlled

observer-blinded feasibility study. We followed the SPIRIT guidelines⁷ for developing the protocol and Figure 1 summarizes the study, based on the CONSORT⁸ flowchart. Novel insights into participants' views of their involvement in dance were explored using qualitative methods. Ethics approval for the study was awarded by NRES Committee South Central Southampton A Oct 2012 and the trial was registered ISRCTN 63088686, February 2013.

Eligible participants had a confirmed diagnosis of Parkinson's disease, Hoehn and Yahr⁹ scale of 1–3 indicating mild to moderate disease severity, lived at home, could understand and follow commands¹⁰ and had previous falls recorded.¹¹ They were recruited from outpatient services, local support groups (Parkinson's UK) and the National Institute of Health Research Clinical Research Network (more details can be found in the published protocol).⁶ Dance partners met the inclusion criteria if they were, similar in age to people with Parkinson's, able to understand and follow commands, willing to participate and able to tolerate the dance intervention. Individuals were asked to nominate a potential dance partner and for those who did not have a partner we recruited healthy volunteers of similar age from the Dance Centre and local gym. Being of similar age was considered important and more typical of the normal social setting.

After the baseline assessment by the blinded assessor (CF), participants were randomized to the dance or control group. A second researcher (SH) (a physiotherapist with dance experience) obtained group allocations by telephone from the trial medical statistician. The feasibility trial was too small to incorporate stratification, but randomization was completed in blocks: one block with 11 participants (eight dance and three controls); and three blocks with 13 participants (nine dance and four controls). The dance to control ratio was 35:15, chosen to maximize the number of people experiencing dance, while still including control participants for feedback on the acceptability of being randomized to the control group, and retention in this group.

Control-group participants were encouraged to continue with usual care, which typically comprised medication, attending medical clinics and routine visits from Parkinson's nurses. They were offered

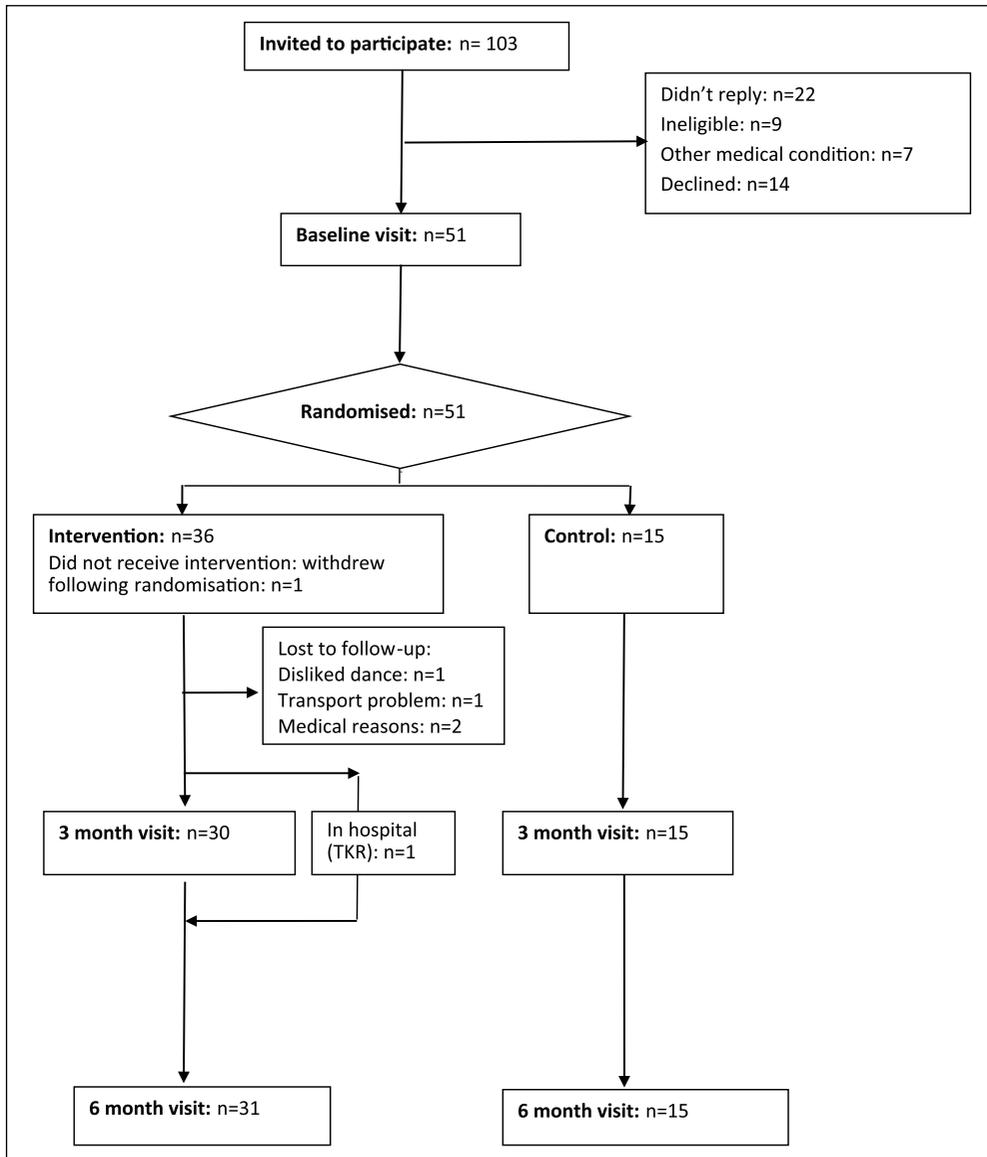


Figure 1. Recruitment flowchart.
TKR: total knee replacement.

vouchers from the Dance Centre to attend classes on completion of the study to minimize any potential resentful demoralization. For ease of management, dance group participants were divided into four blocks that were run consecutively but organized in an identical way. Each participant had a healthy partner and continued to receive usual care.

The classes were run by a local Dance Centre, led by professional dance teachers and supported by SH who advised the dance teachers about Parkinson's, safety issues and assisted with movement difficulties. Classes lasted one hour, twice-a-week for 10 weeks. Six dances were taught: three ballroom (social foxtrot, waltz and tango) plus three

Latin American, cha cha, rock-and-roll and rumba). Field notes were collected (SH) on the types of dance, time spent on each dance and the experience of and challenges for participants to inform evaluation of the process of delivering the intervention.

CF completed the baseline and follow-up assessments at three and six-month post-randomization in the home and was blinded to group allocation. The three assessment visits were organized at similar times of the day (approximately mid-point in the medication cycle) and the two outcomes (Berg Balance Scale¹² and the spinal mouse¹³) envisaged as primary for a main trial were obtained. The Berg Balance Scale is a categorical scale of balance activities (a high score is good with a maximum of 56) and spinal posture was measured using the spinal mouse. The spinal mouse is a handheld device that can measure the position and mobility of the spine and pelvis by recording segmental angles as it is rolled over the spine. Other outcomes were a measure of turning, the standing-start 180° turn test (SS180);¹⁴ the Timed Up and Go Test,¹⁵ the PDQ39 (a self-completed questionnaire rating everyday activities),¹⁶ the ABC questionnaire about balance confidence;¹⁷ the Phone-FITT (questionnaire recording recreational activities)¹⁸ and a simple quality of life measure (Euroqol-5D),¹⁹ see protocol article.⁶ A subgroup of 12 people from dance and 12 people from control groups completed the 6-minute walk test at baseline and three months in the hospital.

A qualitative researcher conducted semistructured interviews to explore the dance experience with a subsample of 14 of the 35 participants in the experimental group (seven men and seven women) and their dance partners, a total of 28 interviewees. Participants were recruited purposively to achieve a varied sample in relation to factors that might impact on their dance experiences: Age, gender and relationship with the dance partner. Dance partners' views were sought to add a valuable dimension to the comprehensive understanding of the dancers' experience. Interviews explored participants' perceptions of the acceptability and appropriateness of dance; impact on mobility and other outcomes and the acceptability of trial procedures. The size and composition of the sample gave

access to a spectrum of views and interviews reached a point where little new information was emerging.

Recruitment, retention and successful completion of outcome measures were documented. Estimation of treatment effect was not a primary purpose of this feasibility trial, but we carried out the statistical analysis of outcomes anticipated for the future trial, namely an analysis of covariance from which estimates the dance vs. control effect at each follow-up point controlled for the baseline value of the outcome in question; 95% confidence intervals are presented along with the results from F tests. The field notes taken during the dance classes were analysed to yield information about the content of the classes. Digital recordings of the qualitative interviews were transcribed. Facilitated by NVivo 9.2, data were managed and analysed thematically using Framework,²⁰ a staged approach.²¹

Results

Results are presented according to: Feasibility of recruitment and retention of people with Parkinson's and dance partners; sample characteristics; the dance content and the feasibility of outcome measures. We have drawn on findings from the field notes and the personal interviews.

We recruited for 12 months (January to December 2013, see protocol article).⁶ The majority of people with Parkinson's were recruited from support groups and NHS Parkinson's clinics. Of the 103 potential participants, 81(79%) were screened for inclusion in the trial. The reasons for non-inclusion were predominantly reluctance to dance twice-a-week or lack the stamina to do so. A total of 51 participants were randomized in the trial as one person dropped out before the dance classes commenced and was replaced leaving 35 participants in the dance group; 17 had their nominated dance partner, while 18 danced with one or more volunteers during all dance sessions (range one to four dance partners) see Figure 1. Nobody dropped out of the control group.

The mean age of participants in the trial was 71 years, volunteer partners were similar, 68 years.

Table 1. Characteristics of the randomized trial participants at baseline. (Figures are number (%) unless stated otherwise).

Variables		Dance (n = 36)	Control (n = 15)
Age	Mean (SD)	71.3 (7.7)	69.7 (6.0)
	Min-max	49-85	59-80
Gender	Male	19 (53%)	6 (40%)
	Female	17 (47%)	9 (60%)
Living status	Alone	5 (14%)	2 (13%)
	Partner	30 (83%)	13 (87%)
	Other	1 (3%)	0
Availability of dance partner	Partner/spouse	23 (64%)	11 (73%)
	Required a volunteer	13 (36%)	4 (27%)
Hoehn and Yahr	1	11 (31%)	3 (20%)
	2	10 (28%)	7 (47%)
	3	15 (42%)	5 (33%)
Time since diagnosis (years)	Mean (SD)	4.7 (3.5)	7.0 (4.9)
	Min-max	0-14.2	1.5-15.2
Mobility status	Independent indoors	1 (3%)	0
	Independent indoors with aid	3 (8%)	1 (7%)
	Independent outdoors	1 (3%)	3 (20%)
	Community independent	31 (86%)	11 (73%)
Outside walking	Limited	1 (3%)	3 (20%)
	<¼ mile	3 (8%)	0
	¼-1 mile	6 (17%)	1 (7%)
	>1 mile uneven surface	26 (72%)	11 (73%)
MOCA score	Mean (SD)	25.1 (4.2)	26.0 (2.8)
	Min-max	10-30	21-30
UPDRS motor exam	Mean (SD)	12.9 (7.5)	10.6 (5.8)
	Min-max	1-29	1-22
FOG score	Mean (SD)	5.0 (4.9)	5.8 (5.3)
	Min-max	0-19	0-16
Number of other medical conditions	Mean (SD)	2.8 (1.6)	2.0 (1.9)
	Min-max	0-5	0-7
Number of medications	Mean (SD)	5.8 (2.7)	4.7 (3.0)
	Min-max	1-14	2-14
Falls in the past year	0	18 (50%)	7 (47%)
	1	9 (25%)	4 (27%)
	≥2	9 (25%)	4 (27%)
Near falls in the past year		18 (50%)	10 (67%)

SD: standard deviation; MOCA: montreal cognitive assessment; UPDRS: unified Parkinson's disease rating scale; FOG: freezing of gait.

Table 1 outlines the characteristics of participants at baseline. The two groups, dancers and controls, were similar with respect to most variables, including age and gender. Participants demonstrated

motor and freezing problems with a range of disease severity and cognitive impairment, 50% (26/51) had experienced one or more falls in the previous year. There was a trend towards time

since diagnosis being longer in the control group. A total of 24 participants (12 from each group) and representative of the total sample, also completed the 6-minute walk test during hospital visits. The summary characteristics of this subgroup were (mean age, dance 73, control 72); (gender, males; dance 7, controls 5); (mean Hoehn and Yahr, dance 2, control 2); and (mean years since diagnosis, dance 5, control 6).

The 14 participants who took part in the interviews comprised seven men (aged 65 to 79 years) and seven women (aged 49 to 81 years), and their dance partners. Six participants had danced with a spouse; two with a friend or family member; and six with one or more volunteers previously unknown to them.

Group comparisons of the Berg Balance Scale, spinal mouse and the other outcome measures at three and six months post-randomization are shown in Table 2. The proposed analysis procedures were feasible, and generally demonstrated non-significant findings, as was expected because the sample was not powered for efficacy testing. Some trends were noted, but in varying directions providing a mixed picture of effect. The results from the 6-minute walk test suggested a trend towards an increase in distance walked by those in the dance group by a mean of 20 m (standard deviation 32 m) while the control group decreased their distance by a mean of 1 m (standard deviation 18 m) between baseline and three months ($P = 0.106$ for difference between groups, Table 2).

Excluding drop-outs, there was missing data from two participants for the Phone-FITT (one at three months and from a different participant at six months, both owing to inability to contact participants) and missing data from two participant sets for the standing-start 180° turn test, SS180 (because of a recording error, the video was stopped too soon). Data from the entire three-month assessment for one participant who was admitted to hospital immediately after the intervention period for an unrelated total knee replacement operation was missing.

The PDQ39, EQ5D and the Timed Up and Go Test were simple to use and no barriers were identified. We recommend using the 6-minute

walk test as the primary outcome in a future trial, but suitable space must be identified. We based our sample calculation for a larger trial on the 6-minute walk test: We found a difference of 18.74 m at three months, with standard deviation of 100 m and 90 m in the dance and control groups, respectively (Table 2). Assuming a smaller underlying difference of 15 m and common standard deviation of 100 m, and allowing for incorporating baseline values with correlation to outcome of $r^2 = 0.90$ (lower than that found here $r^2 = 0.92$), 94 subjects per group are required to achieve 90% power in a two-sided test at 5% level. Allowing for 10% loss to follow-up by three months leads to recruiting 105 per group, and if a further 5% to be lost between three and six months, this would suggest recruiting 110 per group, 220 in total.

We anticipated that participants would dance with the same partner throughout the study and felt this would be reassuring and attract recruitment. Individuals expressed that knowing they could dance with their spouse or life-partner was an incentive for them to participate in the study. From the documented notes, we know the one-hour dance class started with a five-minute warm-up, followed by 20–25 minutes dance tuition and practice and a 5–10-minute refreshment/toilet break, finishing with further 20–25 minutes dance tuition and practice.

The first dance taught was the social foxtrot, the waltz was also started in Week 1, and developed and practiced at all dance sessions. The cha cha was started in Week 1, progressed until Week 6 and then maintained throughout all 10 weeks of classes. Depending on the progress of the class in each block, the rumba was introduced either at Week 2 or 3, the ballroom tango in Week 3 to 4 and the rock-and-roll between Week 4 to 5. Steps were slowly introduced and demonstrated by the teachers and then practiced by the class. The music tempo was reduced for step practice and the teachers demonstrated and gave verbal cues consistently throughout the class.

If the steps were too challenging for an individual or there were safety concerns, SH offered physical assistance or identified options to adapt dance steps with the teachers on a case-by-case basis.

Table 2. Outcomes at baseline, three and six months.

Assessment		Mean (SD)		Dance–control mean difference (95% CI) ^a	P ^b
		Min to max			
		Dance (n = 31 ^a)	Control (n = 15)		
Berg balance (range 0 to 56; higher scores indicate better balance)	Baseline	50.6 (5.4) 35 to 56	51.7 (6.6) 34 to 56		
	3 months	49.9 (6.6) 34 to 56	50.0 (7.6) 32 to 56	1.08 (–1.24, 3.40)	0.354
	6 months	50.4 (5.3) 39 to 56	52.0 (4.5) 41 to 56	–0.82 (–2.91, 1.28)	0.437
Spinal mouse: inclination score	Baseline	7.4 (5.4) 0 to 21	7.7 (5.7) –1 to 22		
	3 months	8.8 (7.8) –5 to 32	7.6 (5.3) 1 to 20	1.53 (–0.69, 3.76)	0.172
	6 months	8.7 (8.0) 0 to 37	7.9 (6.7) –3 to 19	1.15 (–1.37, 3.67)	0.362
PDQ39 (lower scores = better health)	Baseline	21.3 (12.2) 1 to 51	20.3 (11.7) 5 to 38		
	3 months	19.9 (12.5) 1 to 49	18.3 (10.8) 2 to 36	1.05 (–3.02, 5.11)	0.606
	6 months	21.2 (12.1) 2 to 45	18.5 (14.3) 1 to 53	1.85 (–2.97, 6.67)	0.443
SS180: seconds (lower time better)	Baseline	2.1 (0.9) 1.1 to 5.3	2.5 (2.2) 1.4 to 9.9		
	3 months	2.2 (0.9) 1.1 to 4.5	2.0 (0.8) 1.2 to 3.9	0.32 (–0.16, 0.80)	0.187
	6 months	2.3 (1.3) 1.2 to 8.0	1.9 (0.7) 1.1 to 4.0	0.62 (–0.02, 1.27)	0.057
SS180: step count (fewer steps better)	Baseline	4.7 (3.2) 2.5 to 19.5	5.3 (4.3) 3.0 to 20.5		
	3 months	4.6 (2.0) 2.5 to 10.5	4.2 (1.3) 2.5 to 7.0	0.67 (–0.14, 1.47)	0.101
	6 months	5.3 (4.6) 2.5 to 27.5	4.0 (0.9) 2.5 to 6.0	1.82 (0.16, 3.48)	0.032
TUG seconds (lower time better)	Baseline	13.7 (5.2) 8 to 29	13.8 (6.5) 8 to 33		
	3 months	14.4 (5.4) 9 to 30	12.5 (4.3) 8 to 23	2.04 (0.05, 4.04)	0.045
	6 months	13.8 (4.4) 10 to 26	12.3 (3.5) 9 to 21	1.52 (–0.09, 3.13)	0.063
Activities specific balance confidence ABC (higher scores better)	Baseline	82.0 (16.6) 38 to 100	76.9 (22.9) 22 to 99		
	3 months	78.8 (18.9) 36 to 99	73.5 (20.9) 36 to 100	0.65 (–6.81, 8.10)	0.861
	6 months	75.6 (17.6) 40 to 100	75.4 (22.4) 26 to 99	–4.46 (–10.14, 1.22)	0.120
6-minute walk test (m) ^c	Baseline	347.3 (101.9) 92 to 480	394.5 (92.1) 163 to 484		
	3 months	367.3 (100.5) 167 to 530	393.2 (90.1) 165 to 495	18.74 (–4.36, 41.85)	0.106

^an = 30 at three months in the dance group (one participant in hospital).

^bAnalysis of covariance controlling for the baseline value of the outcome.

^cn = 12 at three months in both groups.

SD: standard deviation; CI: confidence interval; PDQ39: Parkinson's disease questionnaire 39; SS180: standing start 180 degree turn test; TUG: timed up and go test; ABC: activities-specific balance confidence scale.

Options included: Only completing half the turn; not letting go of a partner's hand; offering a safety belt for the partner to use to maintain balance of the participant; or reducing the travelling component of the steps. As the class progressed, the teachers and the research assistant left the dance floor but continued with verbal cueing, and finally, if all were able to complete the steps, the class would dance without cueing or assistance. This was rarely achieved.

Challenges were usually linked to mobility (difficulties with turning, co-ordination and keeping up with the speed of the music), and also managing pain and medication. People with Parkinson's had difficulties learning and remembering the steps, as did some dance partners. Participants perceived the instructors to be high-quality teachers, able to assess and respond to their needs, and maintain high expectations while providing encouragement, support and motivation. Almost 18 hours were spent actively dancing or listening to dance instruction; with two hours (six minutes per session) spent on breaks. The two most challenging dances were the waltz (owing to crossing the feet and changing direction) and the cha cha (owing to its speed and less supportive hold).

The two common problems encountered running the trial were related to transport and pairing people with Parkinson's who did not nominate a dance partner themselves. Getting participants to the Dance Centre was eased by allocating a car-parking space or a taxi. Identifying sufficient volunteer dance partners was challenging, as many volunteers were unable to commit to two sessions-a-week for 10 weeks, resulting in participants dancing with a number of different volunteers and required a total of 18 volunteers to cover all classes. Safety was important and carefully managed, one adverse event (pain in legs) was linked to the participant's condition (lymphoedema) rather than the dance, and one person fell during a class owing to loss of balance while standing still listening to the teacher, no injury was incurred.

From the interviews, it became clear that the benefits participants reported were social in nature. A sense of achievement in mastering dancing was widely reported and participants gained significant

enjoyment from the activity itself and from interaction with others. The group environment seemed important in engendering positive feelings both during and after the classes. Participants who identified clear benefit from the dancing in terms of balance or mobility were in the minority; a small number of partners seemed more confident that they saw a change.

Discussion

We organized and delivered the feasibility trial successfully and as planned in the grant proposal. Recruitment was successful, the intervention could be delivered by the Dance Centre as anticipated and the assessments were feasible. We identified some areas where we recommend change to the original anticipated design for a future trial, in particular following our experience of the outcome measures and the recruitment of healthy volunteers.

We recruited 51 people with Parkinson's and 35 volunteer dance partners (17 identified by participants and 18 recruited independently), and as such, this trial is comparable with one of the larger studies of dance for people with Parkinson's.² Key routes of recruitment for people with Parkinson's were via patient groups, outpatient clinics and NHS organizations. Recruitment of healthy partners can work; local dance centres and other venues connected with dancing were the best sources, which generally meant the healthy partners were experienced dancers, an advantage when partnering those with Parkinson's. In previous studies, procedures for recruiting dance partners were not reported; most used students (dance, physiotherapy, medicine).⁵ Dancing with someone of similar age, as implemented in our trial, is more realistic and reflective of everyday life and we believe more likely to be adopted by people with Parkinson's long-term.

A combination of dances and dance steps in this feasibility trial were chosen and guided by the dance professionals at the Dance Centre during the development of the protocol. Although the Argentine Tango has been adopted by Hackney and Earhart,⁵ our dance professionals were concerned

about the safety of backward and cross-stepping during the dance, so we used the simpler ballroom tango. Overall, the dances were deemed appropriate and acceptable by most participants; dancers of all abilities were able to take part and get some enjoyment. The selection of dances was seen as appropriately challenging and the dance teachers were able to adapt the dance steps to progress those with better dance ability, while still engaging less able participants in the same class. The majority of previous research studies⁵ have tended to evaluate the benefits of a single dance within a research environment. In our experience, most Dance Centres include a variety of ballroom and Latin American dances in their teaching. Such dances were included in this study because they reflect popularity and current teaching methods popularized by television shows, such as *Strictly Come Dancing*. Dancers of all abilities were able to take part and enjoy the experience, and the dance teachers successfully adapted the steps to progress and challenge them. Adjustments to the planned protocol focused around accessibility to the Dance Centre (public transport, parking, steps, waiting-room, seating areas); and identifying pathways to recruit volunteer dance partners.

Attendance and adherence to the twice weekly dance classes was good, but opinions were divided on how future classes should be run. Half the group would have preferred classes to be run once-a-week, while the other half would have been happy to continue attending twice weekly. It should be noted that seven of the 12 (58%) who were identified but declined to participate in the trial, stated their reason was that the 'time commitment was too high'. Finally, at the end of the study, while the majority of participants indicated that they wished to continue dancing, they were unable to find a suitable dance class (Parkinson's specific and adapted, running during day-time hours and within close proximity); arrange transport or parking; or find a suitable dance partner. A small number have continued attending a bespoke weekly class for people with Parkinson's at the Dance Centre.

The primary and secondary outcomes originally envisaged for a future trial and evaluated in this feasibility study were similar to those adopted by other

researchers.² While we were able to collect the majority of data as planned, we did not expect and did not find significant differences between groups in our study because the sample was not powered for efficacy testing. We observed some differences between groups in balance and balance confidence, as have other researchers,² but the direction of change was inconsistent, leading to an inconclusive picture. Trends in increased walking distance for the 6-minute walk test showed possible potential for inclusion as an outcome measure in the future. Some researchers have reported significant improvements in the balance of participants who danced, despite small study samples, but we did not. We believe the absence of a clear picture in relation to efficacy emerging from our trial is owing to the small sample size and rigorous procedures with standardized blinded objective assessments.

The battery of assessments was deemed feasible and acceptable by participants and the assessor, but we experienced limitations in this study and recommend changes in the type of outcome measures used in future trials. We experienced problems using the Berg Balance Scale with our high functioning participants (all of whom had to be independently mobile to be in the trial) owing to a ceiling effect, which limited our ability to detect improvement in balance over time; we recommend the Mini-BEST Test as a credible alternative.²² Although the spinal mouse equipment had worked well in previous laboratory-based studies, we experienced some difficulties using it in the home environment and would not recommend its use in large-scale trials. The Phone-FITT was sensitive to change but complex to complete and interpret, and we do not recommend using the SS180 in a moderate-to-large study owing to the time-consuming video analysis required.

Although our small sample size is the most likely reason for the lack of difference between our groups, it is possible that teaching several dances to participants with Parkinson's may have diluted the physical effects and that focusing on one dance, such as that followed by Hackney and Earhart,⁵ may be more productive in terms of outcome. For that reason, we recommend careful consideration of the content of the dance programme prior to planning a larger trial.

There is still a gap in the evidence for the effects of ballroom and Latin American dance as taught in Dance Centres on the activity levels of people with Parkinson's. We have proposed a Phase III trial and anticipate the recruitment of healthy partners, difficulties related to transport and the reluctance of people with Parkinson's to dance twice weekly as ongoing challenges.

Clinical messages

- Dance classes, including ballroom and Latin American dances, show promise as an intervention for people with Parkinson's, not least because of the multifaceted sense of enjoyment and high level of activity.
- Providing guidance or assistance with travel or car-parking will help mitigate participants' common difficulties with accessing classes.

Conflict of interest

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Contributions

DK – organization, analysis and writing; CF – concept, organization and data collection; LR – design and writing; RP – analysis and writing; HR – design and writing; RW – qualitative design and analysis and writing; SH – analysis, writing and intervention; JR – qualitative data collection, analysis and writing; AA – concept, design, writing and guarantor

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