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**‘Dance to Health’
An evaluation of health, social and artistic
outcomes of a dance programme for the
prevention of falls**

Final Report

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Abstract

This report provides the findings of an evaluation of social, artistic (creative), health and wellbeing elements of a specifically designed falls-prevention programme: Dance to Health (DtH). The programme integrates two evidence-based exercise programmes, Falls Management Exercise (FaME) and Otago, with creative dance. Participants on the programme took part in twice-weekly classes for six months. A mixed-method, pre-test, post-test design was used to assess effects and outcomes. This comprised a questionnaire completed at base-point and end-point, which combined five validated questionnaires on loneliness, group identity, general health and functionality and mental wellbeing. In addition, a set of bespoke questions on creative outcomes were devised. A total sample of 67 contributed to the evaluation. The results are encouraging with statistical significance for improvements in group identity and positive support for physical control and coordination and the ability to undertake regular activities. The findings support the need for further research on the effect of Dance to Health (DtH) programmes and highlight the potential benefit of embedding dance programmes into prevention and enablement services relating to falls prevention.

Introduction

A collaborative network, led by Tim Joss, Chief Executive of social enterprise charity Aesop, designed the delivery and rigorous evaluation of a falls-prevention programme entitled *Dance to Health*. The programme integrated the remote but connected professional communities of physiotherapy and artistic dance in taking the principles of two evidence-based falls management exercise programmes and embedding them into a creative dance programme. The programme involved six pilot groups, two in London, two in Oxfordshire and two in Cheshire. Overall, 198 people registered to take part in twice-weekly activities over six-months during 2015-2016.

Background

Ageing population

In 2015, population projections provided by the Office of National Statistics predicted that in the UK between 2014 and 2039 the number of people aged 75+ will rise by 89% to 9.9 million. The number aged 85+ will double to 3.6 million and the number of people reaching 100 could rise six-fold to 83,000 (ONS 2015). This unprecedented rise will have a negative impact on rates of age-related ill-health conditions that in turn are likely to have a considerable effect on the country's economy, with predications of at least an additional £5 billion spend by 2018. A report by Age UK states:

If nothing is done about age-related disease, there will be over 6.25 million older people with a long-term limiting illness or disability by 2030: nearly 9% of the total population (Age UK 2016:8).

In response to these factors, alongside older people's charities, successive Governments have prioritised strategic planning and management of the predicated health and social problems, such as loneliness and isolation, and other conditions that contribute to personal and economic burden.

Group bonding and health behaviour



Positive feelings related to being part of a group that has some element of homogeneity is known to be beneficial to health and wellbeing; the human need to form closely bonded groups is ubiquitous. For example, Wakefield, Bickley and Sani (2013) found that people with Multiple Sclerosis attending a support group had lower levels of depression, and Cruwys et al. (2014) found that, compared with a control group, people with mental health problems benefitted from identifying with either a community recreation group or a clinical psychotherapy group.

In recent years an interest in the relationship between social identity and specific health behaviours has emerged. Looking at specific behaviours around smoking, drinking, exercise and diet and social ties, Sani, Madhok, Norbury, et al. (2015) concluded that:

The greater the number of social groups with which one identifies, the healthier one's behaviour on any of the four health dimensions considered (p. 1).

The study's findings indicate that connections with a number of groups, rather than being locked into one or a small number, can increase a sense of meaning and purpose, which may in turn

have a greater positive impact on levels of self-care and community responsibility. These findings may provide a strong case for embedding Health Promotion and Public Health services within groups, where appropriate.

Falls prevention exercise programmes

Falls represent the most frequent and serious type of accident in people aged 65 and over (Age UK 2010). Approximately 30% of this age group living in the community fall each year (Gillespie et al. 2012). After a fall an older person is likely to have seriously impaired mobility and around 10% will die within a year of a fall (Age UK 2013).

In response to these figures a growing body of research has emerged. For example, Gillespie et al (2012) undertook a systematic review of interventions for preventing falls in older people living in the community and included 159 trials with 79,193 participants. They concluded that group and home-based exercise programmes that usually contain some balance and strength training effectively reduced falls, as did Tai Chi. Multifactorial intervention programmes reduce rates of falling but not risk of falling. In addition, planned, structured, repetitive physical activity interventions, including balance training, strength and resistance training and three dimensional (3D) exercises such as dance or Tai Chi exercise as interventions for older people with a fear of falling were systematically reviewed by Kendrick et al. (2014). The authors concluded that such exercise interventions probably reduce fear of falling to a limited extent and encourage further investigations. The current paucity of evidence-based practice and the subsequent implications have recently been highlighted in key documents that collectively reports:

- The implementation of evidence-based exercise interventions by healthcare providers is incomplete and varies widely across participating sites
- Only 38% of services provide evidence-based exercise programmes
- There is a lack of long term follow-up classes for reducing falls in the community
- The current exercise programmes are prescriptive, do not offer choice and are widely regarded as boring
- Every extra £1 spent on early intervention services relating to falls-prevention and bone health would reduce NHS costs by £2.50

(Age UK 2010a; Royal College of Physicians 2012)

The evidence for effective falls prevention exercise suggests that programmes must be of the correct type, duration and intensity. In a review of the evidence of falls-prevention exercise, compiled for Age UK, Charters (2013) stated that in order to be effective a programme must be sufficiently progressive, take place 2-3 times a week, continue consistently over a duration of at least 50 hours, and be delivered by specially trained instructors (*ibid*):

There is no “one size fits all” solution. Programmes must be tailored to the individual in order to be effective, which means the exercise must be pitched at the right level and enable participants to progress. It must also take medical conditions and falls history into account. (Charters, 2013: 8)

Whilst the collective evidence strongly indicates the need for extending and embedding evidence-based practice more broadly, Charters’ conclusion highlights the challenge of designing falls-prevention programmes that are effective in groups of people.

FaME and Otago programmes

Among the range of falls-prevention programmes that have been developed (e.g. Charters, 2010, Nyman and Victor 2014), only two have benefited from rigorous evaluation: the FaME (Falls Management Exercise) programme (occasionally referred to as Postural Stability Instruction, PSI), which is suitable for primary prevention (i.e. inactive, independent community dwellers at risk of falling); and the Otago Programme, which is suitable for secondary prevention (i.e. post-falls rehabilitation). Skelton et al (1999; 2002; 2004; 2005) conducted a number of important studies specifically focusing on the benefits of FaME and Thomas, Mackintosh and Halbert (2010) systematically reviewed seven trials involving 1503 people on the effects of Otago. FaME and Otago programmes have supporting evidence in relation to preventing falls by as much as 54% and 35% respectively (Charters, 2013, p. 11).

The collective content of the FaME and Otago programmes can be broadly described as developing balance, posture, mobility, strength and trunk and lower limb flexibility and, unique to FaME, on functional floor-based activities. Key aspects of the programmes are seen here:

FaME (PSI):

- Based on Falls Management Exercise trial
- Led by trained a Postural Stability Instructor
- Frequency: weekly class lasting between 45 and 75 minutes plus home exercise twice a week
- Duration: at least 36 weeks
- Exercise is modified according to individual progress, includes floor work to retrain getting off the floor and opportunities to use resistance bands and ankle weights for strength progression
- Exercise meets the American College Sports Medicine guidelines (Nelson et al. 2007) for exercise for older people and therefore increases the likelihood that people will move towards meeting the UK physical activity guidelines for older adults 65+ years (DH, 2011).

Otago:

- Developed by Otago University in New Zealand
- Led by trained Otago Exercise Programme Leader
- Frequency: Participants are encouraged to perform the exercises at home at least three times weekly for 30 minutes to one hour or more and also to walk indoors or outdoors on two other days of the week. Participants are seen by their instructor at home at least four times during the first eight weeks (average twice per week) followed by a visit at the six-month point
- Duration: participants are encouraged to continue the exercises for at least one year
- Exercise: individually prescribed and progressive according to individual progress. Each person receives a booklet with instructions for each exercise and ankle cuff weights (starting at 1kg) to provide resistance for the strengthening exercises
- Additional support is provided through telephone follow-ups each month between visits.

(Based on Charters, 2010 and ACC Prevention, Care, Recovery, 2007)

The need for a new approach: rationale for using dance as a falls-prevention tool

Dance in health maintenance and rehabilitation

The last decade has seen increasing interest in the value of the arts to offer cost-effective support to health and wellbeing at all stages of life. In response to the associated growing body of research, a wide range of multi-disciplinary collaborations has mobilised to explore ways to affect policy change and to develop practice. An essential element to this process is the gathering of robust evidence of effectiveness, impacts and costs (Daykin and Joss 2016).

Recent literature reviews on dance and health have provided important evidence on the following domains of dance:

- Motor function and physiotherapy (e.g. Jeon et al. 2000 and 2005; Holmerová et al. 2010; Federici et al. 2005; Keogh, et al. 2008)
- Psychotherapeutic intervention (e.g. Hokkanen et al., 2003; Krampe et al., 2010)
- Cognitive stimulation (e.g. Wilson et al. 2002; Van de Winckel et al. 2004)
- Expression of self and communication (e.g. Berryman-Miller 1988; Nyström and Lauritzen 2005)

By far the greatest corpus of evidence relates to the impact of dance on physical health, all of which contributes directly, or indirectly, to falls-prevention. Dewhurst and Nelson et al. (2014) suggested that dance contributes to overall physical functioning and Zhang et al. (2008) to improved cardiovascular output. A number of studies, (e.g. Hopkins et al. 1990; Buchner, Cress et al. 1997; Uusi-Rasi et al. 1999; Eyigor et al. 2009; Holmerová et al. 2010) have linked dance activities to improved physical stamina such as muscle endurance and aerobic power. Dance activities have also been cited as supporting executive of motor function; gait, increase in moving with greater speed, agility, mobility and increased flexibility (e.g. Uusi-Rasi et al. 1999; Eyigor et al. 2009; Hackney et al. 2007; McKinley et al. 2008).

A decreased risk of falls has been concluded in studies that have focused on developing lower body strength and improved gait/posture/balance (e.g. Buchner, Cress et al. 1997; Rubenstein, Josephson et al. 2000; Shigematsu et al. 2002; Jeon et al. 2005; Federici et al. 2005; Hackney et al. 2007; Young et al. 2007; Hopkins et al. 1990; Sofianidis et al. 2009; and Krampe et al. 2010).

Health and wellbeing: creative and social imperatives

Over the last two decades, research evidence on the health impact of creative endeavour and productivity has gathered momentum. This growth is based on a better understanding between creativity and evolving definitions of health and wellbeing (e.g. Department of Health [DH] 2007; Stickley and Duncan 2007; White, 2009; Clift et al. 2009; Murcia et al. 2010; Skingley, Bungay and Clift 2012; Burkhardt and Brennan, 2012; Clift 2012; Swindells et al. 2013).

The dynamic nature of health and wellbeing has been plotted over decades by numerous strategic bodies. For example, between 1946 and 2001 the World Health Organisation expanded their definition of health and wellbeing from the ‘absence of disease’, to the ‘presence of positive social and personal resources, as well as physical capacities’, and still later to include ‘the ability to actuate positive activity and participation’ (WHO, 1946; 1986; 2001). Identified wellbeing enablers have included ‘leading a life of purpose’ (Ryff and Singer 1998: 7-8), and ‘creativity and cultural expression and meaningful connections to others in our social world’ (Hasselkus 2002: xii). Related to these are the pursuits of personal growth, ‘noticing things’, ‘maintaining learning’, and ‘giving’ (Aked et al. 2008), which were put forward by NHS Confederation and New Economics Foundation as four of ‘Five Ways to Well-being’. Notwithstanding the need for rigorous evidence of effect (CMO 2013), the Five Ways model is now an established tool for promoting the mental health of the nation.

In 2015, a study from Portugal on the effects of creative dance, physical fitness and life satisfaction found that creative dance that integrates physical, cognitive, and social elements can positively promote healthy ageing (Cruz-Ferreira et al. 2015). Moreover, group dance activities for older people that mobilise these elements align well to the definitions of health and wellbeing highlighted above and the Five Ways messages for pursuing good quality of life.



There is a body of evidence that centres on the impact of exercise on mental wellbeing, (e.g. Medical Research Council, 2010), and, more specifically, a developing evidence-base on dance and mental and social wellbeing:

- Quality of life (e.g. Jerome, 2002; Hokkanen, 2008; Eyigor et al. 2009)
- Mood (e.g. Engels 1998; Arent et al. 2000, Burkhardt and Brennan, 2012)
- A sense of satisfaction/achievement/confidence (e.g Osgood 1990; McKinley et al.2008) Concepts of self (e.g. Berryman-Miller 1988, (Burkhardt and Brennan, 2012)
- Emotional expression (e.g. Phillips 2009; Burkhardt and Brennan, 2012).
- Distress (e.g. Van de Winckel et al. 2004)
- Lower levels of depression and anxiety (e.g. Eyigor et al. 2009)
- Social repertoire (e.g. Guzmán-García 2010)
- Social/cultural identity and connection (e.g. Cornwell and Waite, 2009; Jeon 2005; Stickley, Paul et al. 2015)
- Relationships and communication between healthcare staff and clients (e.g. Palo-Bengtsson 2000)
- Combating loneliness (Cornwell and Waite, 2009; Connolly and Redding, 2010)

Alongside the growing evidence on the benefits of creative activity sits an emerging argument for formally re-orienting mainstream services to include creative activities into health maintenance, promotion and rehabilitation (White 2009; Bungay and Clift 2010). With a focus on physical, mental, cognitive and social health and wellbeing, participatory dance programmes arguably have

a significant role to play in this context (Stickley et al. 2015). In addition, one study also identified the potential benefit to care staff participating in dance activities in relation to empowerment through creative engagement (Lepp, 2003).



Dance to Health (DtH): the intervention

The dance programme

By following the principles and exercises from FaME and Otago and interweaving them into high quality creative dance sessions, the DtH programme aims to develop older people's engagement with dance whilst simultaneously increasing their strength, balance and flexibility and overall feelings of well-being. In the current programme, participants attended two dance sessions a week for 26 weeks: 52 sessions across 6 months. Each dance session lasted for 1 hour and 30 minutes.

The focus of each session was an integration of the falls-prevention exercise principles into a fun, sociable and creative dance session. Each dance session included:

- A warm-up
- Introduction of a dance idea/prop/stimuli/exercise/phrase of movement
- Opportunity to be creative individually and together as a group
- A sharing of creative outcomes
- A cool down

A variety of props and objects, such as scarves and *octabands*, were used in the sessions, and most of the movements were accompanied by recorded music.

Training the dance artists

A crucial element of the DtH programme was the training for the dance artists delivering the programme, each were from one of three Arts Council England-funded national dance agencies¹. Each artist brought their unique perspectives and skills to the robust training programme, designed by Professor Dawn Skelton and Dr Sheena Gawler, Clinical Exercise Specialist and Later Life Training² senior tutor and assessor.

In April 2015, an initial two-day training lab brought together the dance artists, Aesop representatives, dance agency management, researchers and project funders. The lab focused on

¹ South East Dance, Cheshire Dance and East London Dance

² Later Life Training - set up in 2003 to translate research into practice in order to improve the lives of older people. See www.laterlifetraining.co.uk

the FaME and Otago principles. In addition, the dance artists participated in a four-day Knowledge Transfer (KT) in which dance artists translated FaME and Otago into dance programmes, exploring their principles, values and challenges, and their relevance to the creative dance. The dance programmes were divided into two types:

- i) Primary prevention - dance class with FaME model embedded into creative dance activities, for those at risk of falling for groups of up to 20 participants
- ii) Secondary prevention (enablement) - dance class with the Otago model embedded into the creative dance activities for those who have already had one or more falls for groups of up to 12 participants

The KT provided an opportunity for dance artists to identify common ground and review vocabulary used across the disciplines of dance and exercise, for example, the seven key modalities of FaME:

- Strength Training
- Balance Training
- Flexibility Training
- Tai Chi
- Floor-work ('coping strategies' in the event of a fall)
- Backward Chaining (going down to floor and coming back up)
- Endurance (cardiovascular)

In order to engender a better understanding among the dance artists of the theory of falls-prevention exercise and how the FaME modalities, for example, might be embedded into the progressive and creative DtH classes, the following topics were presented and explored during the training:

Theory and research on:

- Prevalence and consequences of falls
- Physical activity, Older People and Falls
- Risk factors of falling

Theory and practice on:

- Postural Stability
Endurance training
- Bone loading workshop
- Balance
- Resistance

Fear of falling, behaviour change theory/motivation

Connections and distinct differences between creative dance classes and falls prevention exercises were identified. However, the majority of the FaME and Otago movements and exercises resonated with the dance artists as routine dance movements, for example, rolling through the foot from heel to toe, giving weight and sliding foot out in front of body and back, is a basic movement that could be embedded into a creative context. Developing body awareness and balance within posture and everyday pedestrian movements are synergies between dance and exercise programmes.

The time invested in training for the dance artists offered collaborative development, a chance to discuss, devise, present and feedback to review how best to integrate FaME and Otago principles into engaging and progressive creative dance sessions.

Key foci of the sessions included:

- Floor-work (coping strategies, resistance and balance)
- Cool down practical including Tai Chi demonstration
- Embedding theory into practice
- Studio creative dance classes
- Exercise management of medical conditions and medications on falls and injuries
- Progression (including integrating equipment) and adaptation workshop
- Health, safety, risk assessment and emergency procedures

Theoretical principles of FaME and Otago were discussed in relation to Rudolph Laban's work (1963, 1975) relating to direction and dance movement; what, where, with and how, body, effort, shape and space: i.e. space, action, direction, plane (vertical/horizontal), dynamics (speed, weight).

Creativity and visualisation/imagery were actively explored as a resource to reduce hesitancy about dance and to encourage movement, curiosity and play. The potential for using bodies as a viable substitute for therabands³ and weights in the resistance sections was also explored. In all cases theory was supported by applied practical activities and vice versa.

Post-training comments from the dance practitioners illustrated their perceived value, for

³ Elastic resistance bands

example:

‘The training was very insightful and really helped to have a deeper understanding of the physiological concepts that falls present in older populations.’ (DP01)

‘Surprising at how quickly dance lent itself to work within the FaME framework.’ (DP03)

‘The information about the reasons for falls prevention, statistics and physiological nfo gave us an awareness of the need and importance of the project – it provided us with the knowledge to speak with authority about the programme.’ (DP04)

During the intervention each of the three geographical locations had lab training days for the dance artists. These sessions were supported by each respective dance agency and provided the opportunity for knowledge exchange.

Peer motivators

Each of the three dance agencies invited participants from their existing older peoples dance groups to join the project as volunteer peer motivators (VPM). This element was an intrinsic part of the creation and running of the sessions. Their role was threefold: i) to undergo cascade training from the dance artists on the FaME/Otago principles and processes and their relationship to the dance sessions; ii) to give the dance artists an opportunity to work with older bodies, to explore individual and group capabilities/limitations before devising lesson plans in which are embedded the essential elements of FaME/Otago) to demonstrate activities and actively support participants in their eventual groups, as the dance artists felt appropriate.

Programme fidelity

The fidelity of the DtH programme to FaME and Otago was maximized by the training described above and to adherence to the impact evidence of the two models (e.g. Skelton et al. 2004; 2005; Thomas et al. 2010; Charter, 2013). The dance artists also designed session templates on which they could ascribe each dance movement/activity to one or more of the models’ principle domains. In addition, throughout the programme the trainers commissioned a number of quality assurance observations in which an experienced later life trainer observed a session to assess its fidelity to

FaME/Otago as relevant. These were always reported as positive with high levels of adherence to the guiding principles (See appendix 2 and 3).



The Evaluation

The evaluation assessed the effect of Dance to Health (DtH) intervention on people who are at risk of falls. The findings aim to:

- Contribute to a better understanding of dance-related falls-prevention programmes
- Contribute to an understanding of the health outcomes relating to GP visits
- Help to address the paucity of evidence on the social effect of such programmes
- Begin to bridge the gap in evidence relating to artistic outcomes, focusing particularly on interest in dance and the development of dancing ability

Methods

Questions

- Can attending regular, specifically-designed dance programmes for people at risk of falls decrease participants' visits to primary healthcare services?
- What are the benefits, if any, to health and wellbeing of such a programme?
- What are the benefits, if any, of integrating creative (artistic) elements into a falls prevention programme?
- What social benefits, if any, are associated with the Dance to Health programme?

The anticipated outcomes aim to support the development of: a workable, scalable intervention programme; increase participation in falls-prevention programmes among people at risk, reduce falls, reduce isolation and develop a greater sense of group belonging, improve physical and mental wellbeing and increase interest and ability in dance.

Design

The steering group for the DtH evaluation comprised: four academics/arts practitioners from Canterbury Christ Church University with collective expertise in health (inc. older people and long-term conditions), dance, dance education, somatic movement therapy, and arts and health research and practice (see Evaluation Team); five community members who had volunteered to assist with the DtH sessions and the evaluation process, Aesop's, Chief Executive, Tim Joss, and Dance to Health Project Manager, Karen Hamilton.

With direction from the steering group the adopted design of the evaluation was supported by established social science research models and guidance (e.g. Broom and Willis 2007; Craig et al. 2008; Bowling 2014) and by the recently devised Aesop Framework for developing and researching arts and health programmes (Fancourt and Joss 2015). Similar instruments were used that have been previously applied in research in the context of singing and health (e.g. Clift et al. 2010) and in dance and health (Quiroga Murcia, Kreutz, Clift and Bongard 2010; Vella-Burrows and Wilson 2016).

Research governance and ethics

Safe-guarding relating to the DtH programme itself was undertaken by each of the delivering dance organisations. Canterbury Christ Church University's Research Governance Ethics Committee approved the evaluation in July 2015. The University's Research Governance Framework (2014) states that: i) the dignity, rights, safety and well-being of all participants must be preserved at all times; ii) participants will be self-recruiting; iii) participants will have the mental capacity to give informed consent; iv) the evaluation will not take place on NHS premises; v) NHS staff will not be required to give any of their time to the evaluation; vi) a risk assessment must be conducted for all sites. These conditions were adhered to at all times.

Data gathering

A pre-test/post-test questionnaire was used alongside interviews and focus group discussions to assess for changes in social and creative life-components and in health and wellbeing over the duration of the six-month DtH programme. The triangulation of methods proposed a rich data source and the opportunity to corroborate findings across the methods (Neales 2008).

Quantitative measures

A 39-item, self-administered questionnaire was completed at base and end-points to record any changes in participant's perceptions.

The questionnaire had six components:

- i) a five-item bespoke section on dance interest, e.g. 'I am interested in dance (for example watching performances and/or learning more about dance)', and perceptions of dance ability, e.g. 'I feel confident that I can control and coordinate my body when dancing'. The dance interest and ability questions were bespoke for this evaluation. They aimed to assess changes in participants' levels of interest in dance and perceptions of their own ability over the duration of the Dance to Health programme.
- ii) five, validated health and wellbeing-centred questionnaires (see Table 1).

Table 1. Dance to Health questionnaire: details of validated questionnaires

Questionnaire	No. of items and purpose	Scale/rating system	Reference
6-item Loneliness Scale	Six items on level and quality of social relationships. Distinguishes between different causes of loneliness	Negative and positive wording* Five-point scale ratings ranging from: 1= 'Yes all of the time' 5= 'Not at all'	Jong Gierveld and Tilburg 2010
EQ [EUROQOL] -5D	Five items on generic health dimensions: mobility; self-care; usual activities; pain/discomfort; anxiety/depression. Can be used in clinical and economic evaluation	Three-level descriptive system comprising: 'No problems' 'Some problems' 'Extreme problems' Includes a vertical, visual analogue scale (VAS) with endpoints labels: 1 = Worst imaginable health state 100 = Best imaginable health state	EuroQol 1990
SF[Short Form]12	Twelve items on functional health wellbeing. Useful in homogenous samples and for predicating medical expenditure	Negative and positive wording* Various-point scale ratings on levels of limitation e.g.: 'Yes, limited a lot' 'Yes, limited a little' 'Not limited at all'	Ware, Kosinski and Ware 1996
SWEMWBS [Short Warwick Edinburg Mental Wellbeing Scale]	Seven items on feelings and functioning aspects of mental wellbeing.	Positive wording. Five-point scale rating ranging from: 'Often' to 'None of the time'	Tennant, Hiller, Fishwick, et al. 2007
GIS [Group Identity Scale]	Four items on social contact-intensity. Associated with healthy behaviours	Positive wording. Seven-point scale rating ranging from: 1 = 'I strongly disagree' to 7 = 'I strongly agree'	Sani Madhok, Norbury, et al. 2014

*A mix of negative and positive wording aims to reduce acquiescent-bias, wherein participants tick the same position box for each answer.

Permission was granted by the governing bodies where relevant for use of validated questionnaires i.e. EQ5D; SF-12; SWEMWBS.

Qualitative data

The qualitative methods comprised face-to-face interviews with day-centre managers where DtH sessions were held, and four DtH dance practitioners. Focus group discussions were conducted with six DtH participant-groups. These processes aimed to expand on the questionnaire responses in order to provide a wider perspective. Open-ended question-frameworks were used to guide the interviews and focus group discussions (See Appendix 1).

Settings and participants

The evaluation took place in the six DtH group locations, two each in London, Oxfordshire and Cheshire. The locations represented a range of districts including from the most and the least deprived 10% in England. The settings included community halls, day-centres and a communal lounge space within an assisted-living housing block.

Recruitment of the sample was through personal verbal invitations delivered during the DtH pilot sessions in each of the six venues. The inclusion criteria were self-selected enrolment onto the DtH programme and mental capacity to give informed consent. Participants were excluded from the evaluation (but not the activity) if they were unwilling or unable to give informed consent. Participants who did not complete at least half of the 52 sessions offered over the six-month intervention were excluded from completing the pre-post test questionnaire but all consenting participants were invited to contribute to a focus group discussion or an interview regardless of when they enrolled onto the DtH programme.

Procedures

Data were collected between July 2015 and June 2016. To address the logistical challenges of late enrollers onto the programme, the DtH project manager and local volunteer peer motivators (VPM) shared the evaluation invitation process. This was preceded by three training events for VPMs (one in each geographical location) which covered the evaluation purpose and process and ethical procedures.

At the initial verbal invitation stage, at which was explained to participants the purpose, processes, confidentiality and intended dissemination of findings, participants were each handed a Participant Information Sheet for their perusal and keeping. After a period of between one and two weeks, the VPMs handed out consent forms to participants who had volunteered to take part and base-line questionnaires for completion. Participants were asked to complete these following a dance session in their usual DtH venue within three weeks of enrolling onto the programme and again within three weeks of its completion six months later.

Instructions for collection and discreet storage of completed questionnaires were given to senior personnel from each of the dance organisations responsible for delivering the programme. These were later collected by the DtH project manager and delivered by hand to the research team, or sent by registered post.

Data coding and analysis

To observe confidentiality and anonymity, settings and participants were allocated unique codes. Settings were alphabetically coded according to their geographical locality, i.e. locations V, R (London), B, A (Oxfordshire), and D, CC (Cheshire). Participants were coded according to the order in which their questionnaire was returned, followed by their dance location, e.g. 01V – 06V. Focus group participants were allocated code P for participant, followed by a numerical code, e.g. P1-P8. Interview participants were coded by the initial of their professional role, i.e. DA - dance artist, CM – centre manager, followed by a number according to the order in which they were interviewed, e.g. DA01 – DA04

The Statistical Package for Social Science (SPSS) 22.0 data software programme was used to analyse quantitative data.

Dependent variable scores were analysed for:

- Dance interest and dance ability
- Group identity
- Social relationships and loneliness
- Wellbeing, health and functioning
- Mental health

Participants' responses to the questionnaire were analysed by comparing mean scores at base-point (Time 1, T1) and at the end-point of the six-month intervention (Time 2, T2). Test-retest correlations between items and paired sample t-tests assessed for statistically significant changes over time. Levels of significance for all analyses were set at $p \leq .05$. (one-tailed).

Verbatim transcriptions of the focus group discussions and interviews were subjected to a preliminary thematic analysis by three researchers independently. By consensus, an analysis template was used to organise the data thematically (Braun and Clarke 2005; Waring and Wainright 2008).

Results

Final sample

The total sample numbered 67 people. Out of a total number of 198 participants registered with the Dance to Health programme, just under 30% contributed to the evaluation. 43 participants completed the base-point and end-point questionnaires. 33 participants, including two day-centre managers and four dance practitioners contributed to the focus group discussions. Table 2 shows the distribution of DtH participants who took part in the questionnaire:

Group and code	End-point questionnaire respondents
London (V) FaME	4
London (R) FaME	5
Oxfordshire (B) (Otago)	8
Oxfordshire (A) (FaME)	17
Cheshire (CC) (FaME)	10
Cheshire (D) (Otago)	0
Totals	43

These results are based on contributions from participants in all six cohorts. They are presented in the order in which items appeared on the questionnaire:

- Dance interest and dance ability
- Group identity
- Social relationships and loneliness
- General health/QOL
- Physical functioning
- Mental health

Findings

Dance interest and dance ability

Table 3 presents the test-retest correlations between items assessing dance interest and ability and also compares mean scores relating to these items at T1 and T2.

Table 3. Dance interest and ability: T1 and T2 means and correlation scores (n=42/43)

	Mean \bar{x}	Std. Deviation	r (T1,T2)	P (1-tailed)	t (df) (T1vsT2)	P (1-tailed)
T1 Interested in dance	1.62	.582	0.30	0.025	0.00	ns
T2	1.62	.539				
T1 Like dancing	1.65	.650	0.51	0.0005	0.50	ns
T2	1.60	.583				
T1 Can dance	2.35	.948	0.46	0.001	0.00	ns
T2	2.21	.804				
T1 Like being creative	2.12	.793	0.52	<0.000	1.00	ns
T2	2.12	.662				
T1 Control/coordinate	2.49	1.009	0.42	0.0025	1.96 (42)	0.028
T2	2.19	.852				

(T1 = base point; T2 = end point; ns = not statistically significant)

The findings show a reasonable degree of consistency in responses over time with the highest value found for 'I enjoy being creative' at $r=0.52$ ($p0.000$). In addition, over time mean scores either remained the same or were lower indicating increased agreement with the statement. Only for the last item 'I can control/coordinate my body' is this change statistically significant ($p0.028$) showing that participants felt that the intervention enhanced their feelings of control over their movements.

Table 4 shows correlations across the dance interest and dance ability items from T1 to T2. These appear unsurprising in general with similar test-retest scores for liking dance and dance interest, and perceptions of dance ability and coordination.

		Interested in dance	Can dance	Like being creative	Like dancing	Control/coordination
Interested in dance	Pearson Correlation	1	.199	.252	.533*	.278
	Sig. (2-tailed)		.201	.103	.000	.071
Can dance	Pearson Correlation	.341	1	.325	.395*	.116
	Sig. (2-tailed)	.027		.034	.009	.458
Like being creative	Pearson Correlation	.331	.401*	1	.311*	.374
	Sig. (2-tailed)	.032	.008		.042	.014
Like dancing	Pearson Correlation	.503*	.486*	.122	1	.157
	Sig. (2-tailed)	.001	.001	.436		.315
Control/coordinate	Pearson Correlation	.354	.463*	.425*	.487*	1
	Sig. (2-tailed)	.022	.002	.005	.001	

T2

T2

* Correlation is significant at the 0.05 level (2-tailed); **. Correlation is significant at the 0.01 level (2-tailed)

The strongest correlations applied to the items 'I can dance' and 'I enjoy being creative', which rose from significance at the 0.05 level [2-tailed] at T1 ($r=.325$ $p<.034$), to significant at the 0.01 level at T2 ($r=.401$ $p<.008$). A similar pattern occurred between the items 'I enjoy being creative' and 'I can control/coordinate my body' (T1: $r=.374$ $p<.014$; T2: $r=.425$ $p<.005$) The correlation between the items 'I like dancing' and 'I can control/coordinate my body' rose from not significant at T1 ($r=.157$ $p=ns$) to strongly significant at T2 ($r=.436$ $p<.002$).

Qualitative evidence on dance interest, ability and creativity

A number of participants spoke about how they were interested and motivated by the dance intervention in the focus group discussion:

'It was the dancing that attracted me.' (P22A)

'I've always liked dancing.' (P18R)

'I love dancing round the house and I remember what I have done here. Better than sitting around and reading.' (P23A)

'I enjoyed dancing when I was younger; I always liked ballroom dancing to be fair. I was interested to see what it was all about.' (P24A)

'If someone said to me do you want to exercise or dance, I would say I want to dance.' (P24A)

Another participant had joined the programme with some trepidation:

'When I saw the advert, I thought it was going to be dancing, when you see the word dance, unless you're into this kind of thing, I can imagine dancing, which isn't what I wanted 'cos I have to work on my balance but she said you'll do well to come to the class on a Friday because it focuses on balance. It's good for your balance.' (P05CC).

The opportunity to increase body control and co-ordination was cited by a number of participants:

'It's making us work, its making us think.' (P05A)

'I think the exercising has been the main benefit, because I have certainly improved my mobility and balance since I have been coming.' (P23A)

'I like the floor work. It winds the session down and you've got the cooling and that's good for your muscles.' (P41D)

'I noticed a difference to my stance.' (P21B)

'I couldn't stand on one leg and hold that leg out...when I first came. So the muscles must have improved as well as the core strength.' (P26B)

One participant enthusiastically stated: 'It is the best thing I ever did...walking through that door that day because it has improved my mobility so much.' (P21B). Another said:

'When I started I could not stand up off a chair, now I can do it quite happily, that is one of my party pieces. Of course everybody round here started noticing that around the building I don't use a stick at all now' (P21B)

There were many examples from the focus group data that related to a sense of achievement in trying something new and increased confidence in dance ability:

'It also gives you a taster. I've never been to the Salsa so we've had a taster of that. The Indian dance, where would you get a taster of that? Same with the jive I think. They put so many

elements in it. If you saw something like that in the future, you think 'I might try that.' (P14R)

'When [dance artist] goes over the steps you find it much easier. Then we can do it because you can do it if you go over it and you find it much easier.' (P01V)

'She has got us doing more advanced things now than when we first started. We have gradually progressed. We are standing more and doing more energetic things.' (P28B)

'I am still under the Falls Clinic and they are saying we can send you transport to come and get you and go to a place in Oxford and I am saying No! I would rather come here, I know the people, I like the people and you are doing things for falling, by walking backwards and forwards. So very good for me!!' (P23A)

However, for one participant the dance experience highlighted her physical challenges:

'It's made me aware of how much more difficult it is to pick things up and I hadn't realised that I had slowed down that much but I can see it now and it's made me realise that my reactions are much slower.' (P41D)

Expression and creativity were also cited as positive aspects to the intervention:

'It's nice to express yourself.' (P40D)

Furthermore:

'I would like to add the creative aspect. Because my background is acting and performing. I've been dancing since 2000 or something like that but not a professional dancer. Not that I would become a professional dancer here but I work under the instruction of the professional choreographer and it's good they give us a little bit of input as well.' (P16R)

Dance artists also offered a view on dance appreciation and creative processes:

'The dancers were very open-minded during the creative process always inputting ideas and suggestions for the choreography.' (DP02)

'The level of dance appreciation of participants was increased.' (DP01)

'The confidence to improvise and express creativity was drastically increased across the life of the programme – both lead artists introduced more complex artistic and creative tasks as the classes developed and leading to the commissioned performance.' (DP03)

'They were exposed to different ways of moving and changed their perception of dance from ballroom / Latin / fitness, they developed a deeper knowledge and appreciation for the wider spectrum of dance participation.' (DP04)

In addition, the dance artists observed improvements in participants' willingness to engage in increasingly challenging complex manoeuvres:

‘The complexity of the dance content that was delivered by the lead artists increased dramatically during the processes and this demonstrates the improvements and achievements of the dancers.’ (DP01)

‘The participants were challenged to think, create and take ownership of the work they did gaining a sense of authority over their movement potential.’ (DP03)

Group Identification

Table 5 compares mean scores relating to the Group Identification Scale (GIS) at T1 and T2 and presents the test-retest correlations between these items.

Table 5. Group Identification: means and correlation scores (n=42/43)

	Mean \bar{x}	Std. Deviation	r (T1,T2)	P (1-tailed)	t (df) (T1vsT2)	P (1-tailed)
T1 Bond with group	1.86	.783	0.36	.008	2.92 (41)	.003
T2	1.49	.592				
T1 Similar to others	2.12	.803	0.20	.100	1.9 (41)	.031
T2	1.84	.721				
T1 Sense of belonging	2.02	.880	0.58	<.0000	3.58 (40)	.0005
T2	1.60	.695				
T1 A lot in common	2.45	.968	0.56	<.000	3.06 (41)	.002
T2	2.05	.844				

(T1 = base point; T2 = end point; ns = not statistically significant)

For three of the four items, correlations were significant but the values are moderate in size. Mean scores across all of the dance groups were lower at T2 than at T1 indicating increased agreement with the GIS positive statements. Changes on all four items were statistically significant at T1 vs T2, with the strongest changes occurring for the items ‘I’ve a sense of belonging to my group’ (p.0005), ‘I’ve a lot in common with my group’ (p.002), and ‘I feel a bond with my dance group’ (p.003).

It is interesting to note the relationship between items on the GIS over time (Table 6.)

Table 6. Group Identification: correlations between items overtime (n=42/43)					
		Bond with group	Similar to others	Sense of belonging	A lot in common
Bond with group	Pearson Correlation	1	.649**	.596**	.313*
	Sig. (2-tailed)		.000	.000	.044
Similar to others	Pearson Correlation	.747**	1	.555**	.557**
	Sig. (2-tailed)	.000		.000	.000
Sense of belonging	Pearson Correlation	.711**	.723**	1	.655**
	Sig. (2-tailed)	.000	.000		.000
A lot in common	Pearson Correlation	.573**	.756**	.641**	1
	Sig. (2-tailed)	.000	.000	.000	
T2	T1				

*. Correlation is significant at the 0.05 level (2-tailed); **. Correlation is significant at the 0.01 level (2-tailed).

These were all statistically significant but the correlations generally strengthened from T1 to T2. For example, the strong relationship between bonding and a sense of belonging rose from $r = .596$ $p < .000$ at T1, to $r = .711$ $p < .000$ at T2. This was also the case between feeling 'similar to others in the group' and having a 'lot in common' (T1: $r = .557$ $p < .000$; T2: $r = .756$ $p < .000$).

Social relationships and loneliness

Table 7 presents the test-retest correlations between items in the 6-Item Loneliness Scale, all of which are significant, and compares mean scores relating to these items at T1 and T2.

Table 7. Relationships and loneliness: means and correlation scores (n=42/43)

	Mean \bar{x}	Std. Deviation	R (T1,T2)	P (1-tailed)	T (df) (T1vsT2)	P (1-tailed)
T1 Enough people close	2.10	1.031	.24	.006	1.34	ns
T2	1.86	.814				
T1 I often feel rejected(~)	1.79	.951	.53	<.001	1.06	ns
T2	1.64	.932				
T1 People I can lean on	2.24	1.358	.36	.009	.34	ns
T2	2.17	1.057				
T1 Feeling of emptiness(~)	2.00	1.192	.58	<.001	-1.02	ns
T2	2.18	1.211				
T1 Miss people	2.28	1.097	.45	.001	.26	ns
T2	2.77	1.245				
T1 People to rely on completely	2.45	1.234	.49	.0005	.393	ns
T2	2.38	1.103				

(T1 = base point; T2 = end point; ns = not statistically significant); ~Reversed scoring applied to negatively worded items

With the exception of the item 'I often have feeling of emptiness', which shows a slight but non-significant rise, all other means lowered hinting towards a minor reduction in loneliness overtime. However, no scores are of statistical significance.

Qualitative evidence on group bonding, social relationships and loneliness

Participants valued meeting new people and being part of a group:

'I don't think there is anybody judging anybody else.' (P05A)

'We can all be silly together' (P16A)

'Everyone gives you a bit of confidence' (P07CC)

'I come here to meet up with a wider circle of friends' (P05A)

In all of the focus groups participants cited positive social connections with the group and dance artists:

'It's getting out of your house, meeting new people, new faces. Even the travelling I enjoy, the fresh air, keeping fit because as we are getting older, keeping fit and exercises and certain things. Apart from our body and ourself retrain, it refreshes you as well. It's something I always look forward to. You're motivated by the people around you or the artist. And you just keep going back for more'. (P05B).

'The teachers treat us well. They're friendly. They're very inclusive.' (P42D)

Participants were also aware that to commit to an activity, where they had to travel and engage with a group, was a good way of combating loneliness and isolation:

‘You have a laugh and I think that is a great help to health if you call chat and laugh.’ (P22A)

‘I would just be sat there in the house.’ (P23A)

‘Coming somewhere like this makes your confidence grow in general because you are meeting new people and conversing.’ (P27B)

A family member also noticed a difference in one participant:

‘My son says he sees a difference in me, because I was fast becoming the woman in the dressing gown. I didn’t go out or do very much.’ (P06A)

Furthermore, a participant spoke about the application of confidence in other aspects of life:

‘My attitude has changed in everyday life, instead of withdrawing.’ (P06A)

Dance artists observed:

‘Social – no question! Dancers joined Leap of Faith from other groups and commented frequently on how much they enjoyed the classes, that they’d never done this type of thing before, they have asked how to continue.’ (DP03)

‘[P16R], the only male participant, came to the session reserved but after several sessions his confidence increased becoming social with the rest of the participants and being open to everyone.’ (DP01)

‘Social groups and relationships were formed at both centers and between dance to health participants and peer motivators.’

Wellbeing, health and functioning

The findings on health, wellbeing and functioning are reported together due to the nature of items on the collective questionnaires, each of which covered more than one of these areas.

Table 8 presents the test-retest correlations between items on the EQ5-D questionnaire and compares mean scores at T1 and T2. With the exception of the item on ability to perform usual family, household, work/study activities, all other item correlations at T1 and T2 were significant, the highest of value being for reported levels of pain and discomfort ($r = .84$ $p < .0001$). No significant

Table 8. Generic health dimensions: mean and correlations scores (n=42/43)

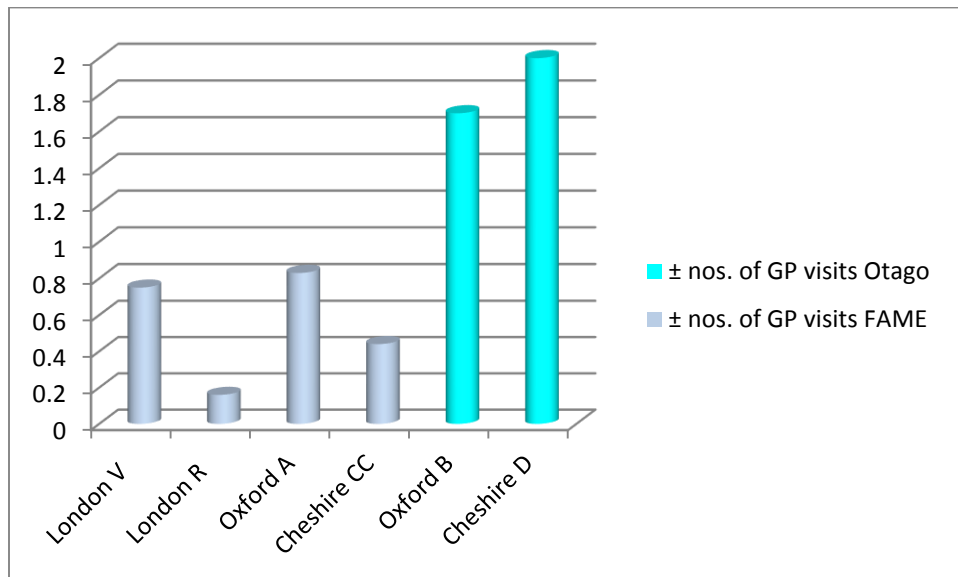
	Mean \bar{x}	Std. Deviation	r (T1,T2)	p (1-tailed)	t (df) (T1vsT2)	p (1-tailed)
T1 Mobility	1.31	.468	.58	<.0001	-.703	ns
T2	1.36	.485				
T1 Pain/discomfort	1.63	.536	.84	<.0001	1.000	ns
T2	1.58	.545				
T1 Self-care (washing/dressing)	1.10	.304	.33	.020	-.813	ns
T2	1.15	.362				
T1 Anxiety/depression	1.45	.504	.56	<.0001	.573	ns
T2	1.40	.627				
T1 Usual activities (family/housework)	1.63	.581	.035	.413	.621	ns
T2	1.56	.502				
T1 Overall health scale	73.37	16.247	.68	<.0001	-1.254	ns
T2	75.93	15.050				

changes were seen on EQ5D overall, although most mean scores between T1 and T2 indicated a very marginal rise in each of the health dimensions. This may reflect the fact that health profiles at T1 generally indicated minimal problems with pain, depression or difficulties with self-care or activity ability across the sample.

Visits to general practitioners

Figure 1 shows a clear disparity in the average number of visits to GPs over the duration of the intervention between a FaME and an Otago-based group with comparable number of participants (n=9). This demonstrates that participants in the Otago groups had higher primary health needs and reflected the group's enablement nature for frailer people who had experienced a fall/falls, compared with the preventative nature of the FaME-based group for older people who might be at risk of falling.

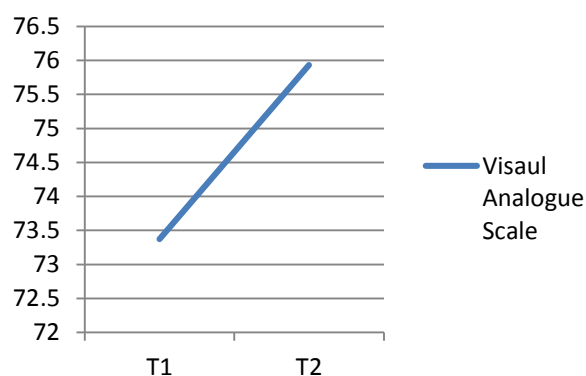
Figure 1. Comparing GP visits in a sample subset of FaME (n=9) and Otago (n=9) group participants



Overall, the average number of GP visits over the duration of the intervention in the FaME-based groups was 24 compared with 20 in the Otago-based groups. However, a comparison was difficult because of the disproportionate number of participants representing each model and an unusually high number of visits reported by one FaME participant who visited her GP for daily treatment for around two weeks during the intervention.

Perceptions of overall health

Figure 2. Ratings for overall health across the sample from T1 and T2



Scores for overall health on a visual analogue scale (VAS) (1 = 'Worst'; 100 = 'Best') rose 2.56 points from 73.37 to 75.93 between T1 to T2 (Figure 2.). Whilst this was not statistically significant, it indicates the maintenance of reasonable health over the duration of the intervention.

Figure 3. Overall health rating at T1: comparing FaME and Otago-based groups

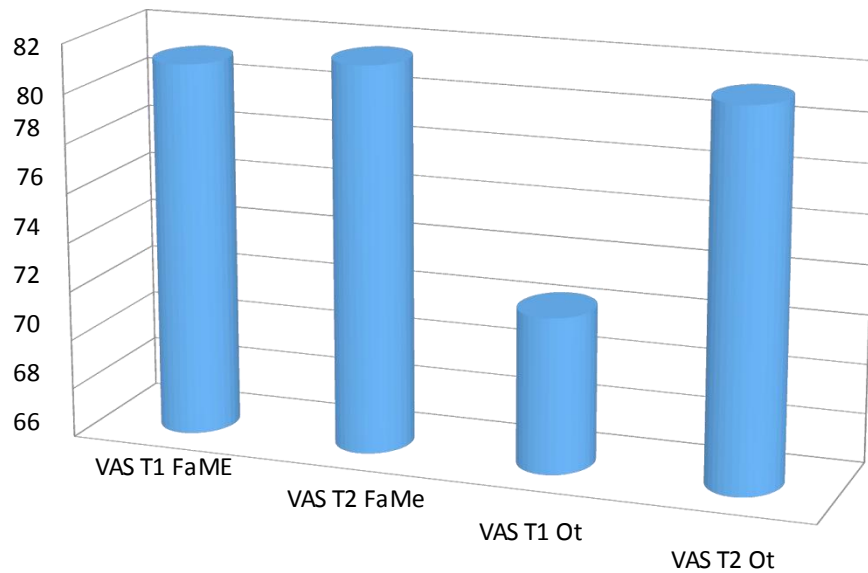


Figure 3 provides a comparison of mean VAS scores for overall health at T1 and T2 for a FaME-based group (n=9) and an Otago-based group (n=8). This shows greater levels of change in the Otago group, which rose from 72.3 to 81.2 (1 = lowest; 100 = highest).



Table 9. Functional health and wellbeing: mean and correlation scores (n= 40-43)

	Mean	Std. Deviation	<i>r</i> (T1,T2)	<i>p</i> (1-tailed)	<i>t</i> (df) (T1vsT2)	<i>p</i> (1-tailed)
T1 General health	2.76	.932	.46	.001	.797	ns
T2	2.64	.932				
T1 Moderate activities	2.35	.720	.62	<.0001	.255	.ns
T2	2.33	.644				
T1 Climbing stairs	2.26	.693	.79	<.0001	.628	ns
T2	2.21	.773				
T1 Physical health/accomplishment	3.76	1.031	.56	<.0001	-.819	ns
T2	3.88	.968				
T1 Physical health/regular activities	3.95	.999	.64	<.0001	1.70(42)	.048
T2	3.72	1.098				
T1 Emotional health/accomplishment	4.12	1.041	.43	.002	.530	ns
T2	4.02	1.137				
T1 Emotional health/care given to activities	4.21	1.001	.30	.026	.260	ns
T2	4.17	1.010				
T1 Normal activities/pain	3.95	1.011	.67	<.0001	-.868	ns
T2	4.07	1.068				
T1 Calm/peace	2.49	.779	.645	<.0001	1.55(40)	.064
T2	2.32	.879				
T1 Energy	2.78	1.025	.73	<.0001	.404	ns
T2	2.73	1.086				
T1 Feeling downhearted	3.83	1.022	.63	<.0001	.350	ns
T2	3.78	1.061				
T1 Physical and emotional health/social activities	3.95	1.024	.42	.003	-1.56(40)	.062
T2	4.22	1.013				

Table 9 presents the test-retest correlations between items on the SF-12 questionnaire, which were all significant, and also compares mean scores relating to these items at T1 and T2. The findings show a reasonable degree of consistency in responses over time with the highest value found in the items 'During a typical day does your health limit you in climbing several flights of stairs?' ($r = .79$ $p < .0001$), and 'During the last 4 weeks how often did you have a lot of energy?' ($r = .73$ $p < .0001$). In general there were no significant changes in SF12 between T1 and T2 with the exception of the item 'During the last 4 weeks, how much time have you been

limited in performing any kind of work or other regular daily activities as a result of your physical health? ($p=.048$). Tendencies towards significance related to participants' levels overtime of a sense of peace and calm ($p=.064$) and the level at which their physical health or emotional problems interfered with social activities ($p=.062$).

These findings indicate an improvement in physical activity/energy and a slight improvement their peace of mind over the six-month duration of the intervention.

Table 10. Mental health and wellbeing: mean and correlation scores (n=40 -41)

	Mean	Std. Deviation	<i>r</i> (T1,T2)	<i>p</i> (1-tailed)	<i>t</i> (df) (T1vsT2)	<i>p</i> (1-tailed)
T1 Optimism	3.85	.802	.47	.001	.000	ns
T2	3.85	.949				
T1 Feeling useful	3.66	.728	.50	.0005	.000	ns
T2	3.66	.825				
T1 Feeling relaxed	3.78	.652	.36	.010	.850	ns
T2	3.68	.650				
T1 Dealing with problems	3.54	.552	.28	.038	-.227	ns
T2	3.56	.594				
T1 Thinking clearly	3.59	.547	.26	.05	.467	ns
T2	3.54	.552				
T1 Feeling close to people	3.78	.759	.44	.002	1.138	ns
T2	3.63	.799				
T1 Ability to make mind up	3.46	.636	.48	.0005	1.302	ns
T2	3.34	.530				

Table 10 shows the test-retest correlations between items on the Short Warwick Edinburg Mental Wellbeing Scale (SWEMWBS) and compares mean scores at T1 and T2. All correlations showed a high degree of consistency overtime. Each was statistically significant with the highest values seen for the items 'I've been feeling useful' ($r = .50$ $p=0.0005$), and 'I've been able to make up my own mind about things' ($r = .48$ $p=0.0005$). All but one of the T1 vs T2 means changed minimally in a positive direction but none of these changes were statistically significant.

Qualitative evidence on general health and mental health

Qualitative evidence via commentary captured in focus group discussions and interviews relating to physical, mental and social health and wellbeing were often intermingled (as seen in previous sections). The following gives more examples beginning with perceptions of the DtH intervention to support mental health. A high majority of participants spoke about enhanced feelings of overall well-being:

‘It enlivens you, the hall, it’s bright and airy’. (P04V)

‘It makes you feel lighter. It takes the weight from wherever you’ve come from in the morning.’ (P13R)

‘That’s it. You feel better. Once you’re been here, you feel better, you go home feeling better’ (P15R)

‘Fresh mentally. Like if I stayed at home, because I’m a carer I would always find things to do but this gets me out of my caring duties for a bit. And then when I go home, my husband he says, ‘Oh you sound, you look very fresh; you look very good’, you know. So I keep coming!’ (P3CC)

Also, in relation to mental health, a number of participants cited cognitive benefits, for example, an increase in memory; being able to recall and remember as a key feature of their development during the dance intervention:

‘Dance is very good for your memory coordination, stimulates you, makes you happy, more flexible.’ (P01V)

‘If you do it more frequently you do remember.’ (P04V)

‘You train your brain through the process. It’s very good and Molly’s very nice and Juna [dance assistant] is very good.’ ‘Once a week is not enough. Certainly if you learn as routine. You forget it in the course of a week – old ones like us – but twice a week is OK.’ (P01V)

‘It’s tapped into the past- the jive- I’m remembering.’ (P15R)

References were also made to improvements in pre-intervention physical health limitations:

‘I feel it has improved my hip and my balance generally.’ (P40D)

‘I found that occasionally if I was to stand up and walk around I would not be wholly steady. I don’t feel that way now.’ (P24A)

‘I wasn’t keen on doing all the things here as all the time I kept thinking I was falling. Not

now.’ (P018R)

A few participants spoke about a development in flexibility, which in turn stimulated motivation, for example:

‘You’re more agile, you know, fresh, you want more’ (P42D)

Whilst the quantitative findings show a varied view of the effects of the DtH programme, these illustrative comments and those shown in previous sections confirm perceptions among participants of a strong relationship between the intervention and support for improvements in physical, mental and social health and wellbeing.



Discussion

The results of this evaluation are encouraging with positive evidence of an association between the Dance to Health programme and the maintenance or improvement of certain domains of physical, mental and social health and wellbeing and in supporting confidence to engage in creative expression through dance. These findings arose even though participants generally reported buoyant levels of health and wellbeing and social motivation at the outset of the six-month intervention. This buoyancy may have contributed to the relatively low levels of change in the quantitative data which show only modest statistical significance in total. However, these narrow floor to ceiling changes were re-balanced in the qualitative data from which strong perceptions of improvement across all of the evaluation domains were consistently recorded.

The Otago-base group numbers were small compared with the FaME-based group numbers so comparisons were difficult. However, it appeared that Otago participants, who were expected to have more advanced disabilities at the outset, may have benefited more from the intervention. This needs further investigation in the future.

Dance ability and interest

The quantitative data showed that participants' enjoyment in being creative in the dance sessions was consistent and their perceptions of ability to control and coordinate their bodies improved over time (*p*28). These factors and others relating to improvements in perceptions of dance ability overall were articulated frequently in the focus group discussions and concur with previous studies that highlight dance as an effective mechanism for supporting not only physical strength, balance and flexibility (e.g. Jeon 2000; Federici et al. 2005; McKinley et al. 2008; Eyigor 2009; Dewhurst et al. 2014) but also the human imperative to be creative (e.g. Phillips and Conn 2009).

Opportunities for creative expression elicited mixed feelings with many participants enjoying self-expression through dance but others more reticent. Where enjoyed, the opportunity was thought to be positive and meaningful. This finding is allied to previous literature that recognizes

the importance of creative expression to support the wellbeing of older people (Cruz-Ferreira et al. 2015). Among the initially reticent, many found that the process of embodiment and casting aside feelings of being judged, improved over time. The benefits of building personal resources and physical capacities as well as expressing oneself creatively and culturally allies well to overarching definitions of health and wellbeing (e.g. Hasselkus 2000; WHO 2001).

Often the dance element of the programme was the key motivator for participants' enrolling but there was also an indication of raised interest in dance overtime from a small number of focus group contributors. Around one-eighth reported a rise in dance interest over the period of the intervention, these tended to be participants who had had some level of reservation about the dance element of the programme at the outset.

Participants also expressed perceptions of gradual improvements in dance mobility and strength, for example improvements to 'core strength' and gaining the confidence and strength to stand on one leg. One of the dance artists observed levels of improvement across these parameters for at least a third of participants in her FaME-based group.

Group Identification

Scores for the Group Identification Scale showed the highest level of significance. All items had significant *p* values indicating a strong sense of bonding, belonging and identity in general. The phenomenon of group attachment was also one of the most prevalent themes in the focus group discussions. Comments around feeling welcome and safe, not being judged, being an important part of something were numerous. Without exception, the sense of camaraderie extended to include the dance artist, each of whom the participants' spoke very fondly. Appreciation for the artists' dance and facilitator skills were frequently raised and appeared to engender a sense of worthiness among participants. A sense of mutual respect apparently enhanced the bond between all parties. These findings are important in light of literature that highlights not only the benefits of group bonding to support mental wellbeing (e.g. Cruwys et al. 2013) but also the relationship between group identity and positive health behaviours (Sani, Madhok, Norbury, et al. 2015).

Relationships and loneliness

The qualitative evidence was very strong in terms of the DtH programme enabling meaningful social relationships and in reducing loneliness. These themes, which linked robustly with group identification, arose in all of the focus group discussions with participants expressing enthusiasm for meeting new people, making and maintaining new friends and sharing motivation to attend and take part in the dance sessions. Scores for quantitative data showed a slight rise in each of the items in the Loneliness Scale but these were not statistically significant. This may be due to the fact that many participants rated their levels of loneliness as low at Time 1. However, a small number of participants recounted stories of transformation, for example, from being 'the women in the dressing gown' to being a confident, sociable individual keen to pursue new activities. This participant and four or five others attributed radical life-changes to the DtH programme. The oft-commented upon connection with others also links well with the Five Ways to Wellbeing message 'connect' as a tool maintaining good mental health (Aked et al. 2008)

Wellbeing, health and functioning

Evidence from participants involved in focus groups supported the DtH programme as being 'good for you' and generally enhancing quality of life. Overall the most prevalent interwoven themes relating to physical, mental and cognitive health and wellbeing were:

- Enhanced feelings of overall well-being
- Improved physical ability
- Positive mood
- A sense of motivation
- Opportunities to achieve
- Positive cognitive challenge
- Improved memory

Little change was evident on EQ5D, SF-12 and SWEMWBS with only one item on physical health limiting regular activities showing a statistically significant improvement ($p.048$) from T1 to T2. However, comments during focus group discussions frequently centred on physical, emotional, mental health and wellbeing improvements. In terms of the former, perceived improvements in balance, core strength, flexibility, mobility and stamina (cardio-vascular) correspond to the findings of previous reviews of the literature (e.g. Keogh et al. 2008). Moreover, the findings in

the current study link strongly with the principles embedded into the FaME and Otago models and the evidence-base highlighting their efficacy relating to falls-prevention (e.g. Skelton 2005; Thomas 2010; Charters 2013). This indicates that the DtH programme is effective in this context.

The qualitative evidence relating to the value of the DtH programme in supporting emotional and mental health also defied the limited changes seen in the quantitative measures and corresponds to the relevant literature indicating positive impact (e.g. Eyigor et al. 2009; Murcia et al. 2010).

In addition, each focus group related the likelihood of the DtH programme as a support to cognitive function. Comments mostly centred on meeting progressive memory challenges, such as navigating and recalling movement sequences. Again these findings concur with the findings in previous studies (e.g. Van de Winckel et al. 2004).

Limitations

Sample size

198 people initially registered for the DtH programme but just under 30% contributed to the evaluation. The study would have benefited from a larger sample.

Training volunteers

Differences in the time that each group started and the delivery of training opportunities for volunteer teams led to different interpretations and some inconsistencies in data collection.

Questionnaires

At times, unclear correspondence between the dance organisations and the evaluation team may have underpinned some problems with identifying time for some participants to complete the questionnaires. Some participants found the length and varied nature of the questionnaire onerous and confusing to complete. This was likely to be due to the linking of several standardised questionnaires with a bespoke questionnaire making a total number of 39 questions. Some questionnaires were completed by participants but had much missing data as questions had been omitted. The research team attempted to address the missing data via telephone interviews but this process was time consuming and resulted in at least three questionnaires being discarded due to

insufficient data.

Recording of visits to GPs

Not all volunteers in each group recorded verbal reports by participants of their visits to their GP during the duration of the programme. This was followed up by the research team and registers were checked but retrospective data gathering may have skewed the facts.

Focus group discussions

Focus group discussions were undertaken with a sample of participants from each group using a question framework around subjective indicators of improved QOL and social wellbeing, improved independence and creative outcomes. These were, in the main, highly successful as the participants appeared comfortable and content to share their views and opinions. Audio equipment was used to record rich sets of data. However, the focus group process was time consuming sometimes causing challenges for participants' travel arrangements and meal times. As with qualitative data of this nature, transcribing the breadth of data was also time-consuming, as was analysing the depth. Three of the groups were large in size which whilst not to discourage willing individuals, at times it was difficult to hear or understand the recordings, especially if two or more people were speaking at once.

Post-intervention questionnaire

The proposal for the evaluation stated that participants would also complete the questionnaire post-intervention. Unfortunately, there has been a high drop-out rate on the DtH programme. Some participants gave their views on this issue in the focus group discussion, suggesting that the twice-a-week commitment may have prevented consistent attendance and the content and/or pace of the dance sessions might not have suited them.

Continuity and progression in dance activities

As this project involved three different areas of the country, contexts, practitioners and participants, modification and differentiation in delivery of the programme would be expected. However, if this were to be a robust intervention programme then planning that emphasised key objectives/foci for each session and continuity and progression in relation to FaME and Otago

principles and exercises, would enable the tracking of participants' development and success of the programme.

Conclusion and recommendations

In answer to the evaluation questions, the Dance to Health programme engendered interest and curiosity around dance and the evaluation process itself appeared to stimulate greater interest in the role of dance in participants' health and wellbeing. The programme, which was evidenced as having been delivered well by the trained dance artists, supported and enhanced a sense of overall health and wellbeing. In particular, and most strongly, relating to group bonding and social relationships and the ability to control and coordinate the body when dancing and outside the dance sessions.

Improvements were reported in physical strength, flexibility/agility, mobility and stamina and in mental wellbeing relating to a sense of belonging, meaningful camaraderie, life-purpose, life-long learning and a sense of achievement.

Based on the results of this evaluation, it is recommended that, as an option for people at risk of falls, a case is made for embedding DtH programmes into prevention and enablement services in the future.

Recommendations on how Aesop might develop the rigour and outcomes of further evaluation to encourage across NHS provision include:

- Considering robust research design for e.g. comparing FaME/Otago physiotherapy intervention with FaME/Otago creative dance intervention
- Including in the research physical measures at base-line and end-point e.g strength, mobility, balance, co-ordination etc.
- Increasing the size and diversity of the sample. This might involve high profile public information consultations and campaigns
- Including a higher proportion of people with existing co-morbidity that negatively affects their mobility
- Building on the multi-centre and multi-partnership nature of the current evaluation to include more, geographically spread HEIs and NHS Trust partners to maximize local research input
- Planning rigorous training for the dance organisations/volunteers/people involved in helping with data collection to maximize the completion of full data sets and managing focus group sizes

These recommendations aim to address problems encountered in: completion of the questionnaire across the sample; the power and effect size; and the 'floor to ceiling' effects, whereby little quantitative change was seen from base to end-point due to existing buoyancy in health and wellbeing among the sample at the outset of the intervention. Whilst the qualitative data is highly encouraging, the potential for greater levels of statistical significance is likely to encourage adoption and diffusion of the programme within the National Health Service.

In addition, if the view would be to continue to build DtH then, as the intervention relies on experienced practitioners with a skill-base in working with older people, an infrastructure of practitioners would need to be developed.

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Appendices

Appendix 1 Interview/focus group discussions question frameworks

The following question framework, which follows a graduated process of background questions, value questions and emotionally-grounded questions will be used in the interviews and/or focus group discussions.

‘What prompted you to come to the dance sessions in the first place?’

‘What did you enjoy about the sessions?’

‘Can you talk about how coming to the sessions made you feel?’

‘Can you talk about any differences that you feel coming to the sessions made to you?’

‘How do you feel about dancing now?’

‘What do you think might be changed to make the sessions better for you?’

The framework is designed to avoid prompting specific themes, such as social engagement, physical/mental wellbeing.

Question framework for the practitioners:

‘What did you enjoy personally about your role as a facilitator of the programme?’

‘What, if any, changes did you notice among the participants as the programme progressed?’

‘What, if anything, do you think might improve the experience for participants in the future?’

‘What have you learnt as a practitioner?’

The final question aims to provide information for the development of the practitioner workforce in this field of work. For the purposes of this evaluation, it is expected to contribute briefly to recommendations for practitioner training and support in the future. The data will also be available for more in-depth analysis for future research.

Appendix 2 An example of quality assurance observation FaME

FAME	DANCE
WARMUP	Dance artist went through good posture with the group before the warm up (everyone grew about two inches!) Warm-up = bonfire routine
CIRCULATION WORK	Rubbing body parts – soup routine
Joint Loosening	Ball game – gentle way of starting to move with choreography
*Spine Rotation	Pass the ball and around bonfire
*Ankle Heel	Bonfire routine – ankle heel and ankle rotation
*Spine lateral flexion	Warmed up for this by rocking on buttocks- great imagery, imagining sheet of glass in front and behind – maybe build up to a few more rather than just once?
*Shoulder Circles	Shoulders up and down and circles during bonfire warm up
Stretches	Making soup stretches (seated) maybe hold stretches a bit longer?
*Calf	Prep for backward chaining – calf stretch using chair
*Hamstring	Hamstring seated
*Shoulder	Yes
*Chest	Yes
	NB – could some of the group do the warm up standing?
ENDURANCE	Fire dance, Reet Petit sequence, winter walk
BALANCE	Bird dance
*Static	Bird dance practice and one run through (so twice)
*Dynamic	Heel walks and toe walks knee lifts in winter walks, backward walks, ice skating (walking and turning)tandem walks) x 2 (one practice and then once with music)
RESISTANCE	
*Leg	Kicking leaves, plies in bird dance, dragging leg along the floor in sequence, ice skating (Leslie went to help one lady)
*Arm	hands pushing together in circle pushing against each other in shadows dance and parachute
*Back	Not seen
BACKWARD CHAINING	Prep for backward chaining – calf stretch using chair
FLOORWORK	Not seen

COOL DOWN	Reminded group of good posture and breathing
*Circulation lowered	Cool down routine
*Stretches and Tai Chi	Cool down routine

Class notes

Times

CLASS STARTED AT 10.46AM FINISHED AT 12
 STANDING 1.17MINS, 9.43MINS, 11.10MINS, 2.09MINS
 PLUS SITTING TO STANDING PRACTICE
 IN TOTAL 23.79MINS STANDING

Overall

Overall a welcoming class where everyone was included, the class included some improvisation and touch (holding hands) was lovely when you went into a big improv. circle and you started to follow the moves, would have loved the music to continue so you could have followed everyone's moves in turn.

The theme of winter ran throughout the class and there were lots of smiles and obvious enjoyment from participants At the start participants told me they felt they had got stronger from attending and Caroline also said she felt they had got stronger.

Who attended

5 participants, 1 dance artist, 1 dance assistant, 1 volunteer with learning disabilities, 1 staff member and Myself total = 11

Development

Could the group start working on a piece that they can add to choreographically maybe? Look at increasing reps of balances and heel/toe type exercises and maybe some of the class standing for the warm-up?

H&S

It was good to see the practitioner helping the one lady with the ice skating, what would he do if she fell? A couple of participants dropped the ball and went to reach for it whilst still seated, the dance artist did tell them she would get anything that fell, keep telling them you will get the ball (same with feathers).

Appendix 3 An example of a quality assurance observation Otago

Otago	Evidenced in Dance	Exercise prescription chart	
Warm up		head movements	YES
Circulation work	Started rubbing body parts and slowly getting the body moving	neck movements	YES
Joint Loosening		back extension	YES
Neck	Evidenced in warm-up – had class laughing over double chin joke	trunk Movements	YES
ankle	Evidenced in foot routine – full use of ankle – loved the pen pushing explanation and link to strictly	ankle Movements	YES
spine (extension and rotation)	Saw spine rotation a few times in different exercises but not extension	front knee strengthen	YES
Stretches		back knee strengthen	NO
calf	Both stretched in foot exercise but not held	side hip strengthen	YES
Hamstring		calf raises	YES
		toe raises	YES
Resistance	Evidence of preparation for resistance and work with weights in several sections	knee bends	YES
Leg muscles only	Mentioned use of weights for next term, preparing class for development	backwards walk	YES
Quads	Sitting to standing and back happened 7 times over the course of the class. 1 x slow motion sitting down during egg routine.	walk and turn	YES
Hamstring		sideways walk	YES
calf	Toe raises in Charleston	heel toe stand	NO
hip abduction	Yes – in African kodo routine stretching leg side to side	heel toe walk	YES
Shin muscles		one leg stand	YES
		heel walking	NO
Balance		Toe Walking	NO
Static	Tightrope walks going forward and back	heel toe walk backwards	YES
Dynamic	Balance exercise in parallel and turnout	sit to stand	YES
	Class spent about 22 minutes standing in 5 minute intervals throughout the class	stair walking number	
		walking time minutes	22
Cool Down			
Calf & Hamstring stretches	Yes in cool down		

Class notes

Participant comments after the class

I do feel a difference in my legs'

'Dance assistant comment to class

I can see you all getting stronger each week'

Class Timings

Started 10.30am finished 11.40am

standing for 22 mins (out of 70min class)

standing times, 6min, 5 min, 30sec, 30sec, 5min, 5min

10 participants

1 x dance artist

1 x dance assistant

1 x OT student

My Observations

Class in theatre style due to space restrictions this seems to be working well.

Dance artist mentioned that their spatial awareness is developing.

Lots of laughing – great!

Dance assistant had a chance to lead one exercise so that dance artist could go around and correct – perfect!

Lots of praise for each member about how well they are all doing.

Choreography from participants throughout – brilliant!

Dance artist started with setting up the body and talking about posture at the beginning of the class and again in the footwork exercise.

During the African routine one couple started to move together holding hands (bit of resistance through arms)

Overall - lots of use of names – good person centred practice.