

Tai Chi Movements for Wellbeing – evaluation of a British Lung Foundation pilot

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Abstract

Aims: In breathless individuals with respiratory disease, pulmonary rehabilitation (PR) can improve exercise capacity, symptoms and ability to cope with their condition. However, access is often limited, and adherence can be poor. Thus, there is interest in developing alternative and complementary forms of exercise intervention and tai chi may be effective in this context.

Method: The British Lung Foundation worked in collaboration with ‘Tai Chi Movements for Wellbeing’ Training to train leaders to run community-based tai chi groups in the UK. Leaders received funding to run 3 months of once-a-week classes consisting of a 12 movement sequence of tai chi. Participants completed a questionnaire survey to evaluate the service at the start of their first session and again after 3 months.

Results: Ten tai chi groups recruited 128 participants, 65% women, mean (standard deviation (SD)) age 70.1 (7.4) years at baseline. Seventy individuals completed the follow-up questionnaire at 3 months. Participants demonstrated an improvement in Medical Research Council (MRC) Dyspnoea Score pre 3 (interquartile range (IQR)=1.8), post 2 (IQR=1), $p=.013$ and disease burden; chronic obstructive pulmonary disease (COPD) assessment test score pre 19.4 (8.7), post 17.9 (9.4), mean change -1.5 (confidence interval (CI): -2.89 to -0.127), $p=.033$. Those who completed the programme had a worse baseline COPD assessment test (CAT) score and were more likely to have participated in maintenance exercise previously. Qualitative feedback suggested that participants felt the classes had helped with breathlessness and relaxation.

Conclusion: Establishing a tai chi for wellbeing programme for people with respiratory disease is feasible, with a reasonable level of compliance, and is perceived to be helpful by participants.

INTRODUCTION

Respiratory diseases are among the largest causes of morbidity and mortality¹ and conditions such as asthma and chronic obstructive pulmonary disease (COPD) lead to a considerable healthcare burden² with considerable unmet need.³ Physical activity limitation is a key feature of COPD⁴ and other lung diseases associated with breathlessness. There is a need for effective strategies targeting physical inactivity and breathlessness to improve quality of life because of the impact of physical inactivity on the development of multimorbidity and mortality rates.⁵

Pulmonary rehabilitation (PR) is

a comprehensive intervention based on a thorough patient assessment followed by

*patient tailored therapies, which include, but are not limited to, exercise training, education, and behaviour change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviours.*⁶

PR is a highly effective approach, but access can be limited by resources, and even when people are able to participate, approaches to sustain the benefits of rehabilitation are needed.⁷ PR provides benefits including physical training, education, confidence in managing breathlessness and a reduction in social isolation through taking part in a group activity. It is likely that a range of interventions, which could be complementary or

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alternative to traditional PR, might be beneficial. These include follow-on exercise programmes,⁸ the use of telecoaching⁹ and Singing For Lung Health.^{10–12}

Another possible approach is tai chi, a traditional form of exercise training developed in China.^{13–15} This may be a more enjoyable activity than a formal exercise class and thus more likely to produce sustained adherence. A Cochrane review of 12 randomised controlled trials of tai chi in COPD found that it improved exercise capacity (increased 6-min walking distance by 29.6m (CI: 10.52m to 48.77m)) and lung function (increase in forced expiratory volume in 1 s of 110ml (CI: 20mls to 200mls)) compared with control interventions.¹⁶ A more recent randomised controlled trial found that, in treatment-naïve COPD patients, tai chi achieved similar quality of life benefits to PR, with better health-related quality of life 12 weeks later.¹³

In light of this evidence, the British Lung Foundation (BLF), developing its current focus on increasing activity participation for those with respiratory disease, is working to establish a network of tai chi groups around the UK. An evaluation of this pilot project is presented here. Compared with previous work in this field, we explore the feasibility of offering a simple 12 sequence version of tai chi, to individuals with a broader range of respiratory conditions than previously investigated in one cohort, with clinical outcomes which have not previously been explored in this population in the UK.

Aims

We aimed to find out if it is feasible to set up and deliver ‘Tai Chi for Wellbeing’ groups specifically for people living with respiratory disease and which are run by BLF-supported leaders. We evaluated feasibility based on number of groups that were set up after the training was delivered, the number of participants attending the groups and participant experience feedback. As a secondary aim of this feasibility assessment, we investigated whether demographic data and outcome data could be collected

from individuals without a professional clinical qualification.

THE PROGRAMME

Background of establishing tai chi groups

Tai Chi Movements for Wellbeing was developed in 2009 by Richard Farmer, Founder and Principal Instructor of the Rising Dragon Tai Chi School, as a movement sequence based on the principles of tai chi which anyone could do, regardless of their physical capability. It was thought at this time that traditional tai chi could have widespread health and wellbeing benefits but a large percentage of the population were excluded from participation due to its complexity.

A pilot study was carried out with a group of patients with acquired brain injury, and following its success, funding was obtained to train a range of healthcare practitioners in the National Health Service (NHS) in Hereford. Since then, ‘TMW Training’ has trained individuals and organisations across the UK and in Europe to deliver TMW in a diverse range of settings. Currently, it is being offered for the general public, through community wellbeing, mental health and rehabilitation schemes, in hospices, care homes, leisure centres and classes for people with long-term health conditions. Public Health Wales has funded training for their Exercise Referral Specialists who offer TMW across the country through the General Practitioner (GP) Referral Scheme. TMW Training is recognised by the Register of Exercise Professionals (REPs).

TMW may be more suitable for the management of COPD and breathlessness than formal or traditional tai chi chuan due to its simplicity. Traditional tai chi is a very complex series of movements (up to 185) that can take a long time to learn. TMW places a strong emphasis on being ‘grounded’, focusing on the base of support provided by the feet and legs. This focus, together with the principles of TMW which are based around being present and graceful as you move, and the gestures based on an expansion and release avoid specific focus on the

breath yet may encourage a more rhythmical flow of the breath. If appropriate, focus can be brought to the breath and the student is encouraged to follow their natural breathing rhythm so that breathing is not being constrained.

With the support of pamphlets and DVDs, students can go home after their first class and begin a daily practice. They are encouraged to take what they learn into their lives, helping them to cope with stress by knowing how to relax and ground themselves on a day-to-day basis. Further information about the programme can be found at <https://www.tmwtraining.com/about/what-is-tmw/>.

Tai chi leader training

The BLF trained 11 TMW instructors. They attended 6 days of training spread out over three weekends in three consecutive months. They then had homework in between and a final assessment. Level 4 exercise instructor registration was required for applicants. This means that they had expertise working with people who have a long-term health condition in exercise classes.

The BLF provided trainers with 14 weeks of seed funding: £30 per week for their professional fee and up to £30 per week for their overheads. They received a poster to use for marketing and the BLF used paid marketing on Facebook to promote the groups. In order to be eligible, the trainers had to have run exercise classes involving people with long-term health problems and therefore they already had experience in how to set-up groups and recruit participants.

The trainers received a 1-h session at their training course about the evaluation programme and how to deliver it. The trainers were responsible for handing out and collecting the questionnaires from participants. The trainers were sent all the evaluation paperwork in advance from the BLF project executive.

In each weekly tai chi session, the BLF TMW Trainers delivered a 12-move sequence of Tai Chi Movements for Wellbeing that can be done seated or standing. These movements are based on the principles of tai chi and chi kung.

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The first principle is that the 'body reflects the mind': mental tension manifests as physical tension in the body, and the use of simple mindful gestures to release tension and 'reflect atmospheres of wholeness' back to the mind which invites a sense of wellbeing.

The second principle is the understanding of 'Soft Limit', the body's natural limit, that is, not overstraining or under reaching, which improves one's ability to come back into balance. This includes moving to support a less restricted limb, by 'mirroring' it with the more-able limb, as opposed to forcing it past its soft limit. Further details of the intervention can be found in the online supplement.

METHODS

Evaluation questionnaire survey and patient experience questions

The evaluation is based on questionnaires administered to participants by the TMW group leaders in 10 groups set up by the BLF around the UK. Leaders were asked to administer the questionnaire survey to participants in the TMW groups at the beginning of the first session and again after 3 months of participation. This provided information about the participants and about the effect of participation.

All the participants who took part in the evaluation completed a consent form which can be found in the online supplement. The BLF sent four reminder emails to tai chi leaders during the roll-out period of groups, and four reminder emails were sent to leaders after 3 months of participation to encourage the receipt of completed questionnaires.

The baseline survey included questions about age, sex, smoking status, how participants had found out about the group, respiratory and other diagnoses, previous participation in PR and/or exercise groups and breathlessness (Medical Research Council (MRC) dyspnoea score). Questions also included average use of inhaler (regardless of diagnosis), and GP visits and admissions to hospital in the preceding 6 months. Open-ended questions were also provided in order to gain feedback on participant experiences of participation in TMW.

Four patient reported outcome measures were also included:

The COPD Assessment Test (CAT)¹⁷ is a widely used respiratory health related quality of life measure. The CAT is scored from 0-40 with higher scores representing greater disease burden. The minimal clinically important difference (MCID) of the CAT score has been established for Pulmonary Rehabilitation as between two and three points, and the questionnaire has been validated in other respiratory disease.¹⁸

The General Anxiety Disorder-7 (GAD-7)¹⁹ is a measure of anxiety and was developed for use in primary care. A score of 5 or more indicates anxiety and 10 or more indicates that a referral to specialist services is warranted.

The EuroQOL five dimension three limits (EQ-5D-3L) is a generic health-related quality of life measure containing five question dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) in different domains with three limits per question. A utility score can be calculated which can be used to estimate the health value of an intervention in regard to quality-adjusted life years.²⁰

The fourth questionnaire was designed by the BLF specifically to pilot for use in a tai chi context for global quality of life measurement. All available data were anonymised by the BLF and sent to the authors for analysis.

In addition to the patient-reported outcome questionnaire survey, individuals were given the opportunity to comment on their experiences of Tai Chi Movements for Wellbeing on a form with questions and open-ended boxes provided for their free text responses. These questions were developed based on previous pilot programmes run by the BLF. The questions are provided in the Supplemental Appendix.

Data analysis

Statistical analysis was performed using SPSS 24. Change following participation in TMW was evaluated for categorical/ordinal-grouped data and non-normally

distributed data using the Wilcoxon signed-rank test, and sign test. Paired t-tests were used to analyse normally distributed data. Baseline differences between participants with and without 3-month follow-up data, and participants with and without prior PR participation were evaluated using t-test, chi-squared test or Mann-Whitney tests as appropriate. Free text data were analysed by the first author (A.L.) who coded and re-coded the data. Codes were grouped into related concepts which were then re-examined in the context of the overall patient experience. Themes were established based on the relationships of concepts, the researcher's reflexive practice in their experience of running PR for individuals with respiratory disease and the researcher's interpretation of what participation in TMW means for individuals living with lung disease.

RESULTS

Characteristics of population at baseline

One hundred and twenty eight participants completed the baseline questionnaire survey (Table 1) from 10 groups. There was an average of 12.8 participants per group (standard deviation (SD): 5.4) and a majority (65.1%) were female. Obstructive lung diseases were most common, reflecting their relative prevalence. Approximately a third (33.6%) of participants had been referred to TMW from PR groups. The majority of participants had completed PR and attended maintenance exercise for at least a year previously. Not all questions were completed by individuals; there were some missing data.

Response to 3 months of Tai Chi Movements for Wellbeing

Seventy participants (54.6%) completed the evaluation at 3 months. Fifty eight participants did not return the questionnaire at 3 months. Ten group leaders returned the questionnaire surveys from their group participants at the end of the evaluation. No data were received from TMW group leaders regarding reasons for drop out. The BLF-contacted group leaders after TMW

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Table 1.

Baseline characteristics	
Demographic (n)	
Age (n = 123) mean (SD)	70.1 (7.4)
Gender M/F (n = 126) (%)	34.9/65.1
Current smoker Y/N (n = 128) (%)	5.5/94.5
Never smoker Y/N (n = 113) (%)	33.6/66.4
Recruitment method (n = 116) n (%)	
GP	4 (3.4)
Respiratory consultant	4 (3.4)
Friend	7 (6.0)
Poster	3 (2.6)
Breathe easy group	6 (5.2)
Pulmonary rehabilitation	39 (33.6)
BLF Website	8 (6.9)
TMW Trainer	38 (32.8)
Other	7 (6)
Attended PR Y/N (n = 127) (%)	62.2/37.8
Attended maintenance exercise class Y/N (n = 113) (%)	68.0/32.0
Participation in maintenance duration (months)	18(30)
Respiratory diagnosis (n = 123) n (%)	
COPD	88 (57.1)
Bronchiectasis	17 (11.0)
Interstitial lung disease	3 (1.9)
Asthma	36 (23.4)
Lung cancer	2 (1.3)
Pulmonary fibrosis	8 (5.2)
Comorbidities (n = 94) n (%)	
Heart disease	27 (18.4)
Diabetes	19 (12.9)
Depression	12 (8.2)

(Continued)

programme completion regarding numbers of patients approached to enter TMW groups. Two leaders responded and the information is provided in the online supplement.

There were statistically significant improvements in the CAT score and MRC score in participants who completed the evaluation at 3 months. Participants reported reduced breathlessness according to the MRC Dyspnoea scale (median change from 3 to 2 Interquartile range = 1, $p = .013$) (Table 2). This was associated with a mean improvement in CAT score of -1.5 points ($p = .033$) (Table 3). Inhaler use, number of hospital admissions or GP visits, GAD-7, EuroQOL utility score, or BLF quality of life (QOL) questionnaire did not significantly change as a result of 3 months of participation in TMW.

SENSITIVITY ANALYSIS

Participants who completed 3 months of tai chi were more likely to have a higher (worse) CAT score at baseline (19.2 vs 14.9 $p = 0.003$), more likely to have completed maintenance exercise programmes post PR (79.7% vs 59.3% $p = 0.020$) and had fewer hospital admissions ($p = 0.040$). A comparison of baseline demographics between completers and non-completers is provided in the online supplement. Furthermore, participants who had previously completed PR were more likely to improve their MRC dyspnoea score (40% vs 10.5% $p = .018$).

Patient experience

The 3-month survey provided participants with the opportunity to comment about their experience of TMW. Free text responses to survey questions have been coded, and four themes describe the participant experience of TMW of being relaxed and calm.

Controlling the breath

Participants appreciated being taught how to breathe:

learning to breathe correctly during the movement does help me to think

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Table 1. (Continued)

Baseline characteristics	
Demographic (n)	
Osteoarthritis	34 (23.1)
Anxiety	17 (11.6)
PVD	2 (1.4)
Chronic pain	13 (8.8)
Sleep disturbance	23 (15.6)

M/F: male/female; Y/N: yes/no; GP: general practitioner; TMW: Tai Chi Movements for Wellbeing; PR: pulmonary rehabilitation; COPD: chronic obstructive pulmonary disease; PVD: peripheral vascular disease; BLF: British Lung Foundation; SD: standard deviation.
All diagnoses and comorbidities per participant are reported. Therefore, total numbers in 'Respiratory diagnosis' and 'Comorbidities' columns are higher than participant numbers. Data are presented with percentages representing the total of participants who completed the respective questions or questionnaires in the survey.

about my breathing during every day activities.

It gives calmness to help control shortness of breath.

I found it helped to control my breathing and taught me the best way to fill my lungs.

These techniques appeared to work for patients because of the pace and intensity in which the movement sequences were delivered:

Taking everything slowly and controlling your breathing.

The gentle exercises have enabled me to relieve stress, calming my mind which helps with my breathing.

Table 2.

Categorical outcome changes from Tai Chi Movements for Wellbeing participation				
Inhaler use (105)	All baseline n (%)	Completers		p value
		Baseline n (%)	Post TMW n (%)	
Hardly ever	20 (19.0)	11 (18.0)	9 (8.1)	
Once or twice a week	6 (5.7)	3 (4.9)	6 (9.7)	
Once or twice a day	45 (42.9)	25 (41.0)	27 (43.5)	
Three to five times a week	26 (24.8)	14 (26.2)	14 (22.6)	
More than five times a day	8 (7.6)	6 (9.8)	6 (9.7)	1 (sign)
Hospital admissions in last 6 months (119)				
0	98 (82.4)	56 (88.9)	63 (90.0)	
1–3	18 (15.1)	7 (11.1)	7 (10.0)	
4–7	2 (1.6)	0 (0.0)	0 (0.0)	
7+	1 (0.8)	0 (0.0)	0 (0.0)	.527 (Wilcoxon = -632)
GP visits in last 6 months (105)				
0	21 (17.8)	12 (19.4)	25 (35.2)	
1–3	77 (65.3)	41 (66.1)	35 (49.3)	
4–7	15 (12.7)	6 (9.7)	9 (12.7)	
7+	5 (4.2)	3 (4.8)	2 (2.8)	.054 (sign z = -1.925)
MRC dyspnoea score (119)	2 (1.0)	3 (1.8)	2 (1.0)	.013* (Wilcoxon z = -2.491)

*Statistically significant difference at a p value of less than 0.05.
TMW: Tai Chi Movements for Wellbeing; GP: General Practitioner; MRC: Medical Research Council.

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Table 3.

Quality of life outcome changes from tai chi participation

	Baseline population mean (SD)/ median (IQR)	Pre (SD/IQR)	Post (SD/IQR)	Change (95% CI)	p value
CAT (124)	17.3 (8.5)	19.4 (8.7)	17.9 (9.4)	-1.5 (-2.89 to -0.127)	.033* (t-test t=2.187)
GAD-7 (127)	5.0 (5.50)	5.2 (5.9)	3.9 (4.8)	-1.3 (-2.39 to -0.20)	.360 (sign z=-.915)
EQ-5D-3L utility (122)	0.76 (0.80)	0.67 (.28)	0.66 (0.29)	-0.1(-0.759 to 0.534)	.767 (Wilcoxon z= .296)
BLF QOL (112)	95.71 (44.75)	97.3 (48.3)	97.8 (53.5)	0.5 (-4.80 to 5.73)	.648 (Wilcoxon z=-.456)

*Statistically significant difference at a p value of less than 0.05.

CAT: COPD Assessment Test; GAD-7: General Anxiety Disorder-7; EQ-5D-3L: EuroQOL five dimension three limits; BLF QOL: British Lung Foundation quality of life questionnaire; IQR: interquartile range; CI: confidence interval; SD: standard deviation.

Breathing control was possible once participants learned to relax:

The harmony and relaxation to coordinate the function of breathing with that of the movements of tai chi.

Attending tai chi has helped me to relax and concentrate. It is so relaxing and being able to focus on my breathing.

Transcendence of physical benefits

The physical benefits of TMW became meaningful for patient spirituality:

I found the experience very moving and spiritual when we had mastered the technique and mood in one.

This spiritual awakening enabled reflection on the role for TMW for individuals:

It has been a rewarding experience physically and mentally, from a firm base enabled us to achieve an inner peacefulness from within that helped to overcome the physical weakness that we endure.

The slow movements bring a sense of calm and wellbeing that makes me feel peaceful yet gives me energy.

Suitability for those with frailty or more severe disease

The intensity of exercise in TMW enabled individuals with comorbidities and severe

respiratory disease to participate and get significant perceived benefit:

I can manage without using oxygen but yet still feel I have exercised. The movements are mostly graceful. I particularly enjoy the wild goose and open the day.

The fact that people with limited mobility can also take part while seated.

Participants reported benefit as a form of exercise that is possible when experiencing an exacerbation:

I think TMW would be good for all respiratory patients as it is something you can do even when feeling unwell. From my experience it helped me to recover quicker.

I found it very helpful even with a chest infection as I was still able to do TMW.

However, some felt that the level of exercise provided was not at a sufficient intensity.

Although I have COPD I am very well and quite fit. I found the style of the tai chi was not for me as I prefer more active exercise.

Sustained benefits following participation

The benefits of participating in TMW were maintained after completion of a session:

Going in tense and coming out relaxed and able to take on the world and all its trouble. Thank you.

I always leave feeling refreshed and ready to get back to everything I have to do.

The feeling of relaxation and calm following the sessions.

The benefits were transferrable to activities of daily living:

I can walk much longer distances and not feel out of breath. I can walk my dog again. I've got enough energy to help me cope with housework, gardening and shopping etc. though I still get tired sometimes.

DISCUSSION

The results presented here represent the first evaluation of a national TMW programme for people with respiratory diseases. Out of 11 leaders trained, 10 groups were set up with approximately 13 participants in each group, and over half participants completed sessions for 3 months providing clinical data. This suggests that establishing community tai chi groups is feasible, with evidence that patients felt that participation had been beneficial. However, although only two trained leaders provided comments about their experience after

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the evaluation ended, they suggest that caution is needed before TMW is offered with the level of resources allocated to the programme in this evaluation. Participant recruitment to groups is hard work and the sustainability of programmes may be an issue. Our results indicate that the ‘Tai Chi Movements for Wellbeing’ programme is more than a programme for generic wellbeing, as TMW is associated with improvements in other clinical outcomes applicable to individuals living with respiratory disease, with statistically significant improvements in participant respiratory health-related quality of life and functional breathlessness. Although these data are uncontrolled, they are encouraging and add to the positive outcome data from clinical trials.

Breathlessness

The main perceived benefits of TMW for participants were an improvement in their ability to control their breathing in association with an ability to relax more effectively. These qualitative descriptions of improvement were reflected in improvements in the MRC dyspnoea score. This reflects a central concept of tai chi being mindfulness and associating the flow of movements with the flow of breath. Of note, these findings were not associated with any significant change in self-reported inhaler use. A shared relationship between reduced breathlessness and inhaler use may not be apparent for a number of reasons. It might have been better to use puffs per day of short acting bronchodilator as a more sensitive and specific measure rather than the broad categories used without any indication of inhaler type. Furthermore, not all patients with respiratory disease use inhalers. The categorical sensitivity and specificity of the breathlessness questionnaire could also be improved. For example, future evaluations could use a more discriminative measure of breathlessness such as the Dyspnoea-12 questionnaire²¹ or the multidimensional Dyspnoea scale²² in order to further understand the mechanisms of improved breathlessness

as a result of this intervention, and would provide novel data, matching this with more detailed physiology. Interestingly, those participants who previously completed PR showed greater improvements in their breathlessness following tai chi according to the MRC Dyspnoea scale. This raises the possibility that tai chi may offer clinical benefit additional to PR via an alternate method of exercise and adds to the dose response of exercise given in PR. These patients may have been more likely to benefit from an alternate exercise intervention as they were more likely to be doing regular exercise already, enjoyed it and were familiar with exercise routines. The effect of maintenance exercise classes may reach a plateau effect and a change in type of exercise may test the body differently, and sufficiently to gain additional benefit. Furthermore, those who have received education on ways to manage breathlessness during PR may have been better prepared to use these strategies during tai chi. However, ‘Tai Chi Movements for Wellbeing’ was designed as a simpler version of traditional forms of tai chi because of a perception that the traditional form may be too difficult for individuals with COPD. However, this may not be the case for some individuals, as illustrated by some of the subjective feedback received and further indicates that TMW is a significantly different intervention to PR, offering improvements in breathlessness management at a reduced physical exertion intensity. Therefore, TMW may also be appropriate for patients who are unsuitable for, or decline conventional PR.

Change in health status

Respiratory-related health status improved following participation in TMW, although the change in CAT score did not meet the minimal clinically important difference (MCID) seen among people who note an improvement following PR. PR is normally delivered by a multi-disciplinary team with at least two weekly sessions.²³ There is likely to be a trade-off between the ‘dose’ of intervention delivered, in this case TMW, and the cost and inconvenience of taking part more frequently. A previous randomised

controlled trial (RCT) of tai chi in COPD found a 12.4 point improvement in the St. George’s Respiratory Questionnaire (SGRQ), over three times the defined minimum clinically important difference of four points, after 3 months.¹³ However, the tai chi programme provided in this Chinese study was delivered five times per week, a much more intensive intervention. Future tai chi pilots may require at least twice-a-week sessions, perhaps over a more intensive initial period, to provide clinically significant improvements in health-related quality of life.

Methodological issues and limitations

Since the aim of the programme was to establish feasibility and patient acceptability, we did not have a control group. This is a limitation because we are unable to know the magnitude of change in a matched group of people living with respiratory disease receiving an alternate intervention of usual care. In future research, a control group is recommended in order to provide a more precise estimate of the effect of TMW in respiratory disease care. Only 2 out of 10 TMW leaders provided comments about their experiences of group set-up and delivery. We are unable to comment on leader experiences overall but the comments provided by leaders enable a more moderate interpretation of other results in the evaluation.

A high proportion of the participants had already engaged in other physical activities in the past including PR and maintenance exercise programmes. The fact that additional benefits occurred in relation to disease burden and breathlessness is encouraging.

Data collection was incomplete, though participation at 3 months was similar to that observed for PR courses. As with any intervention, a proportion of patients will find that it does not suit them and can be encouraged to consider different options. No data were available as to why individuals had not completed their 3-month questionnaire when they were posted back to the BLF.

There were differences in baseline demographics between completers and

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non-completers of TMW. It may be that those who have previously completed maintenance exercise are likely to continue a similar intervention which may offer similar benefits. However, those who completed TMW also had poorer quality of life at baseline. This may suggest that tai chi may be an intervention which is more appropriate for patients with a high disease burden, or that the intervention was not sufficiently tailored to those individuals with a better quality of life at baseline.

Summary of findings and recommendations

The TMW programme we describe here successfully trained tai chi leaders who were able to establish community tai chi groups. Improvements were noted in breathlessness and quality of life. However, the mechanisms of action of TMW remain unclear and data collection was incomplete.

More nuanced measures of inhaler use and breathlessness may be helpful in future research. Further controlled trial data are needed regarding the scale and duration of effects of tai chi in respiratory disease, and further work to understand the benefits may help refine treatments. Additional resources need to be committed to ensure that evaluation is as complete as possible, but we would recommend that it is feasible to offer TMW to people with respiratory disease.

CONCLUSION

Recent trial data suggest that tai chi may be an appropriate intervention for individuals with respiratory disease. This service evaluation included a national sample of individuals with respiratory disease who had participated in 3 months of once-a-week TMW sessions; the intervention was feasible and improved participants' breathlessness and health-related quality of life. Therefore, TMW is a group-based physical activity that could be offered to individuals with respiratory disease should sufficient resources be available. Longer-term evaluations are needed to address the effects, and a balance between the likely dose response effect and the resource implications for delivering a more frequent intervention will need to be reached.

AUTHORS' NOTE

TMW leaders received funding to run 3 months of weekly classes consisting of a 12 movement sequence of tai chi.

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agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

DATA SHARING

Data can be made available by request to the corresponding author.

ETHICAL APPROVAL

Ethical approval was not sought for this analysis because data obtained were for a BLF internal service evaluation.

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SUPPLEMENTAL MATERIAL

Supplemental material for this article is available online.

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