A before-and-after service evaluation of Tai Chi Movements for Wellbeing (TMW) on physical and psychological wellbeing in a mixed health population

Summary report

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An independent report by

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Credits and acknowledgements

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The analysis of the data and the preparation of this report was undertaken by Andrea Finney, an independent social researcher with 16 years' experience undertaking and managing research in (and for) central Government and academia. In addition to being a freelance researcher (Social Research and Statistics), Andrea is an honorary Senior Research Fellow at the University of Bristol. Andrea was also a qualified TMW trainer at the time this report was produced, but not when the service evaluation was designed or the data were collected.

The author takes full responsibility for the content of this report, and is grateful to TMW Training for granting her complete intellectual control over the analysis and reporting of the data.

This summary is based on a more detailed working paper, available on request from TMW Training (www.tmwtraining.com) or the author (www.socialresearchandstatistics.wordpress.com).

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A summary report by Andrea Finney, on behalf of TMW Training, August 2016

Introduction

With origins in Tai Chi and Qi Gong, Tai Chi Movements for Wellbeing (TMW) is a specially-developed sequence of movements for promoting physical and emotional wellbeing. It is characterised by 'mindfulness through movement' and, being possible to be practised standing or seated, is accessible to a potentially wide range of students with and without clinically-relevant health conditions. TMW is provided as part of the GP Referral Scheme in Wales, and TMW Training is endorsed by SkillsActive and is an approved Register of Exercise Professionals Training Provider.

A comparatively new discipline, first piloted in 2009, TMW currently lacks a robust evidence base of its impacts on physical and psychological wellbeing. The results discussed here relate to a service evaluation of TMW, delivered to a mixed population of predominantly older people, most of whom self-referred to open classes offered in community settings. The evaluation incorporated a simple before-and-after measurement design.

Approach

As part of its service monitoring and evaluation, TMW Training collected a large bank of data from students of TMW courses in 2012 and 2013. The data were collected via 13 TMW practitioners holding 'light protocol' TMW courses for adults. The courses typically comprised open, small group classes of between three and eight students, for an hour per week for 6 to 8 weeks.

Service users were asked to self-complete a one-page, paper-based evaluation form before they started a TMW course and again on completion. The form comprised 14 statements relating to different aspects of physical and psychological wellbeing (these are shown in table 1). Students were asked to rate their current status against each statement on a scale of 1 and 10, where 1 indicated 'Not good/poor' and 10 indicated 'Very good/no problem'.

The evaluation measured physical and psychological wellbeing in relation to 14 statements

A total of 195 students (92 per cent of all responding students) completed both evaluation forms. They were mostly older adults (68 per cent were aged 60 or over), female (84 per cent) and without a long-term health condition recorded by the practitioner (77 per cent). The characteristics of the 195 fully responding students were representative of the 210 students in total who completed the form before commencing their TMW course. To enable full analysis of the outcomes for the 195 fully responding students, responses to any individual missing statements on the evaluation form (e.g. if a respondent had struggled to rate their wellbeing or had accidentally missed a statement) were substituted with the mean (the arithmetic average) of the responses for that statement for the rest of the students.

Service users were mostly older, women, and at least one in five had long term health conditions

Table 1: Statements relating to physical and psychological wellbeing measured in the evaluation

Item name	Statement
Balance	How steady on my feet I feel
Energy	The amount of energy I have to complete everyday tasks
Confidence	The degree to which I believe I am able to cope with the demands of daily life
Worry	How well I cope with worrying thoughts, either about the future or the past
Coordination	The degree to which I feel I can perform a task with precision
Participation	My ability to participate in life and undertake routine tasks in daily life
Emotion	To what extent I feel able to remain in my 'emotional' centre if I am knocked off balance. How quickly can I recover my 'emotional' poise
Fatigue	How tired I feel
Flexibility	The amount of range of movement I feel I have
Sleep	The degree to which lack of sleep affects my ability to carry out my daily tasks
Breathing	How at ease I am with my breath/ breathing
Pain	How intrusive my pain is on a daily basis
Mobility	How confident I feel that I am able to get around independently
Focus	My ability to focus and concentrate to see tasks through to completion

Findings

Analysis was undertaken of the wellbeing scores before and after a TMW course for each of the 14 statements. Three further scores were calculated, based on the combination of subsets of related statements: one representing psychological wellbeing (comprising the statements: worry, emotion, confidence and focus); one representing wellbeing in movement (comprising: balance, coordination, mobility and flexibility); and one representing fatigue and pain (comprising: sleep, pain energy and fatigue). A total score was also calculated across the 14 statements, to represent students' overall wellbeing before and after a course of TMW. The four scales produced by combining these statements were all found to measure their underlying concepts (e.g. of overall wellbeing) well.[1]

The statements were combined into three subscales – psychological wellbeing, wellbeing in movement, and fatigue and pain – with a final scale measuring overall wellbeing

Table 2 shows mean scores for all 14 individual statements and the combined scales at baseline and at follow up and the resulting mean differences between the two. Average wellbeing at baseline ranged from 5.6 points for the statement 'fatigue' to 7.9 for 'mobility' (on a scale from 1 to 10 points). This increased to 6.8 and 8.5 respectively at follow up. The average score of 'overall wellbeing' at baseline was 93.5 (on a scale from 14 to 140 points) increasing to 105.7 at follow up, while average scores on the subscale 'psychological wellbeing', for example, rose from 26.5 at baseline to 30.1 at follow up (on a scale from 4 to 40 points).

[1] These combinations of statements, and their interpretation, were informed by Principal Components Analysis, which examines the patterns of correlations between statements to identify underlying, common concepts represented by the data. The ability of the individual measures to capture the resulting scales and subscales were indicated by high internal reliability (Cronbach's alpha) scores.

Table 2 Wellbeing scores at baseline and follow up and mean difference and results of dependent samples t-test

	Mean at baseline	Mean at follow up	Mean difference (Follow up-Baseline)	
Individual statements				
Balance	6.8	7.8	1.0	***
Energy	6.3	7.2	0.9	***
Confidence	6.8	7.7	0.9	***
Worry	6.1	7.0	0.9	***
Coordination	7.0	7.7	0.7	***
Participation	7.2	8.0	0.7	***
Emotion	6.4	7.3	0.9	***
Fatigue	5.6	6.8	1.3	***
Flexibility	6.3	7.5	1.2	***
Sleep	6.1	7.0	0.9	***
Breathing	7.0	7.9	0.9	***
Pain	6.6	7.2	0.6	***
Mobility	7.9	8.5	0.6	***
Focus	7.2	8.0	0.8	***
Combined statements				
Psychological wellbeing	26.5	30.1	3.5	***
Wellbeing in movement	28.0	31.6	3.5	***
Fatigue and pain	24.6	28.2	3.6	***
Overall wellbeing	93.5	105.7	12.3	***

Notes. Base size = 195 students. Asterisks (*) indicate statistical significance of the mean difference.

The change in TMW students' scores between baseline and follow up for the 14 individual statements varied from an improvement by 0.6 points for self-reported pain and mobility to 1.3 points in relation to fatigue. There was an improvement of 3.5 or 3.6 points in relation to each of the three combined subsets of statements. Overall wellbeing, improved by 12.3 points; this is equivalent to a, moderate, 10 per cent increase in wellbeing. Taking into account the scope for self-reported scores to decrease as well as increase, these appear to be substantive changes in wellbeing, of practical importance.

The change in scores following a course of TMW was equivalent to a 10 per cent improvement in overall wellbeing

The asterisks (*) shown in Table 2 indicate which scores differed statistically significantly between baseline and follow up, with three asterisks indicating highly significant differences.[2] In each case these differences were highly significantly. As such, these differences are also statistically important and robust, representing an improvement, consistent with a positive effect of TMW, although it may not be directly attributable to it (due to the influence of other factors).

[2] Statistical significance is a way of quantifying our confidence that the results from a sample can be generalised to the population from which the sample comes. In other words, a statistically significant result here is likely to represent the benefit of TMW to other people with similar characteristics to those students who took part in this evaluation. Three asterisks indicate significance at 99.9 per cent level of confidence, two asterisks indicate significance at 99 per cent level and one at 95 per cent level.

When analysing the findings for changes in overall wellbeing further, it was clear that the improvements were felt equally by men and women. However, the change in overall wellbeing following, and apparent benefit of, a course in TMW was influenced significantly by the age with younger students tending to experience greater improvement. For example, the average overall wellbeing scores of students aged in their 50s increased by 15.8 points (or 13 per cent). Even so, even older age groups improved including those aged 70 and over whose scores increased at follow up by an average of 7.8 points, equivalent to a six per cent improvement in wellbeing.

Average overall wellbeing scores of students aged in their 50s increased by 13 per cent

The influence of age on differences in overall wellbeing was independent of students' other characteristics available in the data, including their gender, any recorded health conditions and which practitioner taught them. Their change in score was also independent of their score at baseline.

Nonetheless, students' scores at baseline also influenced the amount of change they experienced. With every 1 point increase in the score at the baseline, the difference in score between baseline and follow up decreased by just under half a point. This is intuitive because lower baseline scores offer greater capacity for improvement. This means, for example, that someone scoring 93.5 points (the average) on the overall wellbeing scale at the baseline could expect to see an improvement at follow up of 3.3 points on average, all other things being equal. Someone scoring 50.0 points at the baseline could expect to see a difference at follow up of 22.3 points on average, all things equal. Additionally taking into account the effect of age, someone in their 60s, 50s or younger should, on average, experience even greater change.

Those with lower wellbeing at the baseline saw the most improvement following a course of TMW

Conclusions

In a before-and-after service evaluation of TMW, there were significant improvements in personal wellbeing among mostly self-referring older adults following a short course of TMW. In relation to overall wellbeing, this represents an improvement in the order of 10 per cent, or 12.3 points on a scale ranging from 14 to 140. Significant improvement was observed for each of the 14 individual measures of physical and emotional wellbeing. Change was particularly strong in relation to flexibility and fatigue. Any improvements were felt equally by men and women, and more strongly among younger age groups (although improvements among older groups are also likely to of practical importance). The most important factor, however, relates to an individual's baseline score; with those with low wellbeing experiencing the greatest benefits.

These improvements were associated with TMW, and appear to be consistent with a benefit of TMW, making TMW a potentially valuable non-invasive and accessible tool as part of wider toolkit for public health and wellbeing. However, the limitations of the evaluation design, which include the absence of control group of people who did not participate in TMW and the role of social desirability effects, mean that the improvements associated with TMW may not be attributable (solely or in part) to TMW. Future research should help to clarify the extent of the direct impact of TMW on wellbeing and which aspects of the protocol contribute to this.

TMW appears to be a potentially valuable, accessible tool as part of wider toolkit for public health and wellbeing