

TAI CHI HEALTH

Maybe you saw some of the research comparing tai chi and zumba on BBC 2's *Trust me I'm a Doctor*? It all started in October 2015 when I first spoke to Nor Fadila Kasim, a doctoral researcher at Birmingham University. We discussed the idea of a research project comparing tai chi to a more obvious aerobic exercise and decided on Zumba Gold. We felt that this would fit the target group of the study: 60 to 75 years old writes Mark Peters

Taking on the gold



Key study group help to determine and compare the differences between tai chi and Zumba Gold

Nor and Dr Sarah Aldred visited one of my *Painting the Rainbow* classes later that year to try tai chi and qigong for themselves, and I helped them apply for funding support from the TCUGB in early 2016.

The project started later that year and Nigel Ryan ran the sessions. The classes finished in December 2016 at which point the University of Birmingham School of Sport, Exercise and Rehabilitation Sciences started their analysis of the research.

Word must have spread because in April 2018 the BBC contacted Nor and wanted to feature the work on BBC Science. Coincidentally, the BBC had also contacted me to discuss tai chi and pain management due to some recent research into tai chi and fibromyalgia. The universe seemed to conspire against me as when the BBC decided to film I was again going to be out of the country. The presenter turned out to be Dr Michael Moseley of *Trust me I'm a Doctor* fame. The show aired on BBC 2 on Wednesday 10th October. (I believe it may still be available on iPlayer.)

It is amazing how long things take. The full research *Tai Chi is an effective form of exercise to reduce markers of frailty in older age* was finally published in March 2020. Please contact me if you would like a copy. It includes details of all of the tests carried out, including functional fitness, flow mediated dilation, blood pressure, blood tests, psychological well-being and more.



Mark Peters

An abstract

Frailty affects the quality of life of older age adults by limiting mobility, reducing physiological reserve and



Prepare to dance! Tai chi vs zumba. Tai chi commences in an experimental class

reducing independence. The frailty phenotype is typically characterised by exhaustion, loss or lack of physical activity, weight loss and weakness, although more recently there have been proposals to extend the frailty criteria to include physiological characteristics such as inflammation, oxidative stress and vascular function.

Exercise has the potential to prevent, delay or even reverse frailty, but not all exercise is perceived as suitable for an older population. The purpose of this study was to test tai chi and Zumba Gold as exercise interventions in older adults (65 to 75 years old) to improve characteristics related to the frailty phenotype. Muscle strength and flexibility (functional fitness as a measure of weakness), cardiorespiratory fitness, blood pressure, vascular function (FMD), markers of oxidative stress (total antioxidant capacity, malondialdehyde, 8-isoprostane, protein carbonyl), inflammation (CRP) and aspects of wellbeing related to exhaustion were assessed at baseline (pre-), six weeks (mid-) and 12 weeks (post-intervention). Both tai chi and Zumba Gold, improved, to a similar extent, systolic blood pressure, vascular function, and functional fitness, following the 12 week intervention. Furthermore, antioxidant capacity and lipid oxidation was significantly increased after 12 weeks of tai chi compared to baseline. Anxiety, physical and mental fatigue decreased in both groups, with a greater decrease in mental fatigue in the tai chi group.

[More details of the research and surprise findings](#)

Tai chi group

Participants randomised to the tai chi group were guided by a certified instructor registered under the Tai Chi & Qigong Union of Great Britain (TCUGB). Sessions consisted of a 10 minute warm up, 40 min of shibashi qigong set of 18 movements, Cheng Man Ching style tai chi form, and ten minutes of cool down. During the

session, participants were constantly reminded to have natural and relaxed breathing, and to aim to synchronise the breathing with their movements.

Zumba Gold group

Zumba Gold training was given by a certified instructor. Sessions consisted of ten minutes of warm up which included stretching and whole body movements, followed by 40 minutes of Zumba Gold routines. The routines were performed using slow to fast music from the selected rhythms of merengue, salsa, cumbia, flamenco and bachata. All movements involved elements of a cardiovascular workout, balancing, and dynamic stretching. The session was closed with cooling down and stretching session for ten minutes.

Why tai chi?

The slow movements within tai chi, combined with deep diaphragmatic breathing, are believed to be beneficial to both physical, and mental health. A meta-analysis revealed that tai chi can improve fatigue in clinical populations to a similar extent to more intense exercise such as fast walking (Xiang *et al.*, 2017). Musculoskeletal strength improves by increasing the neuromuscular response in the lower extremities during the slow movements (Hass *et al.*, 2004; Wu *et al.*, 2004), and specifically for older adults there are reports of a reduced risk for falling and improvements of functional fitness (Rogers *et al.*, 2009). Benefits for cardiovascular health have also been reported, most consistently for blood pressure in both people with cardiovascular disease (Wang *et al.*, 2016) and apparently healthy older adults (Rogers *et al.*, 2009). However, less is known about the benefits of tai chi on vascular function, which is a risk indicator for cardiovascular events.

There is preliminary evidence that tai chi can improve vascular function (Wang *et al.*, 2002; Shin *et al.*, 2015), but other studies reported no such benefit (Suksom *et al.*, 2011). There is also preliminary evidence that tai chi can



Dr Michael Mosely (right) with (left) TCUGB instructor Nigel Ryan and the tai chi research group

be effective in perturbing redox status and reducing inflammation (*Palasuwan et al., 2011; Huang et al., 2014; Mendoza-Nunez et al., 2018*).

Rosado-Perez et al. (2012) reported that daily tai chi training for six months significantly increased total antioxidant status (TAS), and the antioxidant enzymes superoxide dismutase (SOD) and glutathione peroxidase (GPx) in healthy older adults. Lipid peroxidation was decreased (as measured by malondialdehyde -MDA) post exercise training, compared to the no-exercise control group.

Similar results using a shorter eight week intervention also resulted in increased TAS and GPx concentration in both pre and post-menopausal women (*Palasuwan et al., 2011*). In studies to date, the comparison data either comes from baseline (*Palasuwan et al., 2011*), walking exercise (*Rosado-Perez et al., 2013*), or no exercise control (*Rosado-Perez et al., 2012*). However, many studies have proved that exercise is effective in improving frailty (*Chin et al., 2008*), and thus the more pertinent question relates to the value of tai chi compared to other forms of aerobic exercise. Hence in this study we chose to compare tai chi to a form of aerobic dance.

So why were Shibashi and Cheng Man Ching style tai chi chosen? Shibashi is now the most widely practised qigong set in the world which is amazing when you realise the Prof. Lin Housheng first developed it in 1979, when he combined elements of tai chi and qigong. In the same year, Prof. Lin successfully demonstrated his qigong skills at China's State Council (Beijing) to three deputy prime ministers and over 300 scientists.

I first learnt this qigong in 1991 when training with master Wu Chiang Hsing in Batu Pahat, Malaysia. It has become so popular that many people are now teaching shibashi sets, often without any formal training by a recognised teacher. The quality control and validity has gone out of the window. With this in mind, I asked to be re-assessed by professor Lin Housheng, the creator, and am pleased to say that I am now one of only four people in the UK qualified by him to teach sets one and two.

Over the years, I have witnessed the health improvements shown by students living with chronic conditions such as COPD, heart disease and chronic pain.

It is also effective for falls prevention. The seeming ease and gentle repetitive nature of the movements means they can be practised by young and old alike to increase energetic vitality, rejuvenate the body, mind and soul, and gain more physical agility and flexibility.

The Cheng Man Ching style of tai chi is based on yang style (Yang Cheng Fu), with the postures being smaller and more upright. The gentle nature of the style, with its main focus on 'sung' (relaxation), makes it ideal for the frail older group that were the focus of this study. I have been practising for approximately 30 years and have been teaching this form to patients with chronic medical conditions for over 15 years. I have used this combination of tai chi form and qigong in a number of studies over this time, including one for cardiac rehabilitation, the findings of which gained funding to produce the only tai chi DVD currently available on the NHS.

Highlights from TV

During filming Dr Michael Moseley was fitted with a pulse monitor to check his heart rate, had ultra-sound scans of blood vessels to measure flexibility and elasticity, and blood tests to measure anti-oxidant production which is a healthy response to exercise. Dr Moseley was surprised that the seemingly gentle tai chi and qigong session felt like quite a workout. His heartrate doubled which is the same effect as a bout of aerobic exercise. Tai chi was shown to have a positive impact on heart rate, blood pressure, oxygenation, production of antioxidants, elasticity of blood vessels etc.

Study outcomes

This study presents data to show that 12 weeks of tai chi improved markers of physiological and psychological health, which make up the frailty phenotype in older age adults. Tai chi is capable of stimulating similar improvements in vascular function, physical function and quality of life as an aerobic mode of exercise such as Zumba Gold, especially in strengthening leg muscles and body endurance, and thus it has the capability to reduce frailty. The authors of the study thanked the Tai Chi Union for Great Britain for their support in this study. 🇬🇧