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The Story of the Evolution of a Unique Tai Chi Form: Origins, Philosophy, and Research

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Abstract

The purpose of this article is to introduce a unique tai chi form that has been successfully implemented in two large randomized clinical trials. The intervention is composed of a series of tai chi movements chosen for their particular meanings, thus adding a cognitive component to the practice of a moving meditation. Over the last decade, the intervention has continued to evolve as it has been used in different populations. Most recently, medical qigong has been integrated to strengthen its potential impact on a variety of biobehavioral measures associated with cardiometabolic risk in women. Following an appraisal of the authors' process as well as the philosophy, practice, and research of tai chi and qigong, the authors share the story of their intervention to contribute to the evolving research of these safe, well-received, low-cost, and beneficial practices.

Keywords

tai chi; qigong; moving meditation

In 2000, we decided to investigate tai chi (TC) as a potential stress management intervention in a psychoneuroimmunology (PNI) based research project for individuals living with human immunodeficiency (HIV) infection. The literature at that time was focused primarily on TC for the reduction of falls and fractures in the elderly, but there was growing evidence that it may be effective as a stress management intervention.

Ten years later, our TC intervention has been successfully implemented in two RCTs. The first was for individuals living with HIV infection (5 R01 AT00331 NCCAM, NIH), and the second was for women with early-stage breast cancer (5 R01 CA114718 NCI, NIH). Results from these studies have been reported elsewhere (McCain et al., 2008; McCain et al., 2010; Robins et al., 2006). Most recently, based on our prior research, my interest in cardiometabolic risk and cardiovascular disease (CVD) prevention, and an appraisal of the philosophy, practice, and research, the intervention has evolved and now includes medical qigong (chee-gung; QG). This parallels the evolution of the literature, which is moving toward the integration of TC and QG as “moving meditations,” given their shared philosophical foundation and similarities in practice and outcomes. It is anticipated that the addition of medical QG will enhance the intervention's biobehavioral effects as well as allow the intervention to be adapted for different disease states and populations.

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The new intervention has been pilot tested for acceptability and feasibility in a small sample of women at risk for CVD. It is now being tested in an RCT in women at risk for CVD. The purpose of this article is to introduce a unique TC intervention in order to contribute to the evolving research on a safe, well-received, low-cost, and beneficial practice. Please see the appendix for full descriptions of the TC form.

Evolution of the Form

The beginning point for developing the TC form was to ground it in a holistic PNI framework. PNI involves investigation of the mechanisms of multidimensional psychobehavioral–neuroendocrine–immune system interactions, including the influence of psychosocial, spiritual, and behavioral factors on immunologically moderated and mediated diseases. It is well known that chronic stress and the associated psychological distress activate the hypothalamic–pituitary–adrenocortical and sympathetic–adrenomedullary systems, generally inducing immunosuppression. Over time these systems become fatigued and then exhausted, further contributing to dysregulation and disease development. Based on this framework, the TC intervention would be designed to incorporate psychosocial, spiritual, and behavioral dimensions to help individuals better cope with stress.

HIV Infection

Two of the researchers on the team had taken TC classes in the past. One had studied the Short Yang form and after 36 weeks of studying this form, had not learned half of the 108 movements. Clearly the Short Yang form was not a viable option. The most practical form found was Tai Chi Chih. This is composed of 19 movements and one pose, still a daunting and impractical form for a 10-week intervention, particularly for individuals with a wide range of physical challenges. Thus, we decided to develop a more accessible, practical TC intervention.

Cultivating stillness can be a very foreign concept in western culture so the idea of moving meditation was highly appealing. The other transformative aspect was our recognition of the metaphoric meanings underlying the movements—another way to keep cognition active. A cognitive element creates a conscious focus on the metaphor for enhanced awareness. Given this discovery and my desire to include a cognitive/metaphorical explanation of the movements, we chose to develop our own form.

We have developed a unique way of using TC as a stress management intervention. The movements were chosen based on their particular meanings as well as their relative ease of performance. Although there is a focus on “chi” or energy as well as the conscious use of breath and movement to induce relaxation, there is also a cognitive component. The participants are taught the meanings of the movements to enhance their stress management abilities. We felt that integrating a cognitive component would make TC more accessible and useful for a Western population. For example, the “Tai Chi Bow” reminds us that we are connected to each other as well as the earth and sky. It honors these connections and acknowledges that we are exactly where we are supposed to be in this moment.

During the first clinical trial, the highly active retroviral therapy (HAART) protocol was becoming widespread. This transformed an HIV prognosis from dealing with a debilitating illness and end of life issues to preparing to live with a chronic disease. Individuals became stronger, more active, and often returned to work. Thus, the advent of HAART created two new issues related to research in this population: participants had less free time and different stress management needs. A more practical, accessible form of TC with a cognitive component was a good fit in this population and the intervention was well received. Participants consistently voiced the desire to participate based on the possibility of learning

TC, something new and different. Attrition was 19% in this group, meaning that 81% of participants remained in the study, attending at least 8 of the 10 TC classes. They voiced that TC helped them feel more relaxed and helped them worry less and handle stress better. Participants were consistently disappointed if random assignment did not result in placement in the TC group. This study was designed with a “wait-list control group,” meaning that those participants assigned to the control group could choose an intervention at the end of the control period. Participants almost always chose TC.

Early-Stage Breast Cancer

Integrating lessons learned and feedback from the participants in the first clinical trial, the intervention was adapted for women with early-stage breast cancer. Participants living with HIV disease, post-HAART, were physically stronger than we had anticipated and shared that while their time was limited, they wanted to learn a few more movements. It was anticipated that women with early-stage breast cancer were as able bodied as post-HAART HIV participants. To increase the complexity, but still deliver a manageable research intervention, We decided to add the Five Elements form to the intervention based on its moderate level of complexity as well as the beauty and impact of its meaning. It was anticipated that although these women would be experiencing great physical, mental, and emotional challenges, there was great opportunity for growth in the face of this chaos. The results of this study indicated that offering interventions following instead of during chemotherapy is more manageable for these women. Despite this timing issue, women voiced excitement and enjoyment about learning TC. The attrition rate was 27%, which was higher than in the HIV study. Participants indicated that they enjoyed the classes, stating they usually felt much better physically and emotionally when leaving class but were less able to attend because of symptoms related to chemotherapy treatments.

CVD Risk

Since these earlier interventions, We have come to understand that TC in its truest sense is a martial art. With a deepening awareness and personal exposure to Eastern healing arts, We have been drawn to TC’s foundation, QG. As a result of this broader understanding, I recognize the TC intervention I have developed can be strengthened by incorporating a focus on the form of QG known as “medical” QG. Medical QG is tailored to produce specific physiological benefits. In working with women with increased risk for CVD as evidenced by increased waist circumference, We felt We needed to develop a stronger, more focused intervention that would have more impact on weight and other biobehavioral mechanisms associated with CVD. The intervention now encompasses a cognitive focus on the meanings contained in the TC movements as well as the conscious use of breath and movement to enhance mindfulness and relaxation while providing moderate intensity level TC and QG exercises targeted at mechanisms associated with CVD risk. A rich description of TC and QC is presented in the section titled “Integrating TC and QG: Philosophy, Practice, and Research.”

As one aim of a community-based participatory research study funded by the Virginia Commonwealth University Institute of Women’s Health (P30 NR011403), feasibility and acceptability of the current intervention has been assessed (Robins, 2010). The primary aim of the research was to create a sustainable stress management program for individuals living in the Fulton Hill neighborhoods in Richmond, Virginia. Women aged 30 to 60 years with a family history of CVD were invited to participate in a 12-week TC intervention. Following informed consent and before group participation, demographic and lifestyle data were collected (Table 1). Most participants were able to attend 8 to 10 of the 12 classes. Following participation, feasibility and acceptability of TC as a stress management strategy were assessed through program evaluation forms and a focus group. Participants’ statements

on evaluation forms and in focus groups included “I love coming to class, it’s the one thing I do for me” and “It makes me feel calm, it has really helped my anxiety.” TC was found to be an acceptable form of stress management for these women. Participants applied TC-related breathing and relaxation practices and principles learned in class regardless of the presence or absence of daily TC practice. Metaphoric meanings are used (even when motions were not possible) to enhance ability to manage situations in daily life. This has been a consistent finding throughout this research trajectory.

In each of the aforementioned studies, participants shared stories of how the meanings and messages of the movements helped them manage stress. One participant spoke of how she used the movement “Smoothing the Waters” to help her two children settle disputes. She would have them stand facing each other and literally or figuratively throw whatever they were fighting about on the floor between them and have them do “Smoothing the Waters.” This helped them smooth out and resolve their differences. “Embrace Tiger, Return to Mountain” was a favorite movement across all studies. It involves opening to the idea of embracing what frightens us (“tiger”) so that it may be transformed through love, allowing us to return to a place of peace (“home”). Participants spoke of the feelings of empowerment they experienced when thinking about this movement. The “Five Elements” form was particularly meaningful to breast cancer participants. This movement contains “Embrace Tiger, Return to Mountain” and represents the ongoing cycles of birth and death on the earth and in all aspects of our lives. They shared that it helped them recognize there was a time and season for everything, that everything was in a constant state of transformation, and that this stage in their lives would pass and they would enjoy happier, healthier times again.

As part of the feasibility and acceptability evaluation in Fulton Hill, women who practiced the intervention routinely offered advice for helping women incorporate TC practice into an already busy life. Suggestions included remembering the need to care for themselves so they could care for others, practicing even for a few minutes every day was better than missing the practice all together, practicing while waiting for children to get off the bus, and engaging the family in the practice. These preliminary pilot data have been integrated into the current TC/ QG intervention.

Integrating TC and QG: Philosophy, Practice, and Research

Philosophy and Practice

In the West, TC is thought of as a moving meditation, a technique to promote relaxation. In the literature, it has been described as a movement therapy that increases awareness of the mind–body connection by enhancing awareness of one’s body as a means for expression of inner feelings and ideas (Chen & Snyder, 1999) and as a moderate intensity exercise (Lan, Chen, & Lai, 2008). In China, it was originally developed as a martial art and is also practiced there as a dance as well as a religious ritual (Chen & Snyder, 1999). LaForge (1997) conceptualized TC as low-level physical exercise that teaches participants “to be mindful of the intrinsic energy from which he or she may ultimately perceive greater self-control and empowerment” (p. 53).

In existence for more than 5,000 years, QG is a Chinese energy-based healing practice (Hole, 2005). Likely its origins lie in the dances of ancient Chinese shamans. The Chinese character for “qi” means breath, spirit, or life force. “Gong” means work or “benefits acquired through perseverance and practice” (Reid, 1995, p. 3). Health is based on the amount and unimpeded flow of qi. A healthy person has more qi than an ill one, but health is more than an abundance of qi.

According to Davis (2008), QG is composed of various individual movements taught within different schools of thought including martial arts, Taoist, Buddhist, and medical traditions. Medical QG comprises one arm of Traditional Chinese Medicine and focuses on the “prevention and healing of diseases and imbalances” (p. 13). QG has four basic applications: health, longevity, martial power, and spiritual enlightenment (Reid, 1995). The practice of QG is focused on sensing, cultivating, and working with our vital life force to improve health and on creating harmony of mind, body, and spirit with nature and the universe (Davis, 2008; Hole, 2005).

Research

The body of research on TC is extensive, yielding empirical evidence that TC may influence physical as well as psychological states. More than 500 studies have been conducted on the effects of TC. Much of the research has been done in older populations. Routine practice has been shown to (a) delay the decline of cardiopulmonary function in older individuals (Lai, Lan, Wong, & Teng, 1995; Lan, Lai, Wong, & Yu, 1996); (b) provide aerobic stimulation, improve feelings of vigor, increase urinary catecholamines and serotonin, decrease salivary cortisol and mood disturbance (Jin, 1989, 1992); (c) increase self-rated physical functioning and enhance immunity to varicella zoster in generally healthy older adults (Irwin, Pike, Cole, & Oxman, 2003); (d) improve a variety of measures associated with falls in the elderly including increased flexibility, strength, and balance as well as reductions in number of falls and fear of falling (F. Li et al., 2005; Sattin et al., 2005; Wolf, Barnhart, Ellison, & Coogler, 1997; Wolf, Coogler, & Xu, 1997; Wolf et al., 1996, Wolf et al., 2001, Wolf et al., 2003, Wolf et al., 2006); (e) increased balance and sustained improvements in cognitive function in the elderly (Taylor-Piliae et al., 2010); (f) reduce depressive symptoms in older Chinese patients (Chou et al., 2004); (g) decrease osteoarthritis pain (Song, Lee, Lam, & Bae, 2003; C. Wang, Collet, & Lau, 2004); (h) improve disability and vitality and attenuate joint deterioration in rheumatoid arthritis (Kirsteins, Dietz, & Hwang, 1991; C. Wang et al., 2005); (i) retard bone loss in postmenopausal women (K. Chan et al., 2004; Qin et al., 2002); (j) improve self-assessed health (Taggart, 2001; Y. T. Wang, Taylor, Pearl, & Chang, 2004); (k) reduce depression and improve well-being (Chou et al., 2004); (l) improve sleep quality (F. Li et al., 2004); (m) increase quality of life (QOL) and physical functioning in HIV infection (Galantino et al., 2005; Yeh et al., 2004); (n) decrease symptoms and increase QOL in patients with fibromyalgia (C. Wang et al., 2010); (o) improve immune function in individuals with diabetes (Yeh et al., 2009); (p) induce favorable changes in lipid profiles and anxiety (Tsai et al., 2008); and (q) enhance sleep in the presence of congestive heart failure (Yeh et al., 2008).

Multiple systematic reviews have been conducted over the last decade. In a review of 26 studies, TC was associated with notable reductions in systolic and diastolic blood pressure and glycemic control (Yeh, Wang, Wayhne, & Phillips, 2008). In two critical scientific reviews, TC was found to improve QOL, psychological well-being, pain management, sleep, kinesthetic sense, balance, flexibility, strength, activity tolerance, immune function, cardiovascular and pulmonary function, and fall and fracture risk (Klein & Adams, 2004; Kuramoto, 2006). In another review of 31 studies involving TC, J. X. Li and Chan (2001) found beneficial effects on cardiorespiratory and musculoskeletal function and posture control, as well as reduction of falls in the elderly. In a systematic review of 20 prospective, randomized, placebo controlled clinical trials, Tai Chi Chuan was found to decrease state and trait anxiety, reduce fear of falling and number of falls, improve sleep quality and duration, and lower systolic blood pressure and lipids (Mansky et al., 2006). Several reviews yielded less significant results. Wayne et al. (2004) reported that some data exist to support the use of TC for vestibulopathy, but more research is needed. M. S. Lee, Pittler, and Ernst (2007) concluded that TC had not been shown to be effective in rheumatoid arthritis.

Finally, in an integrative review of the effect of TC on fall prevention, Wooton (2010) concluded that the data on the impact of TC on balance and fall prevention are conflicting because the mechanism of action of TC is not understood, and it remains unclear which particular balance exercises are effective. Many of the reviews cited methodological flaws with many of the studies.

Compared with TC, QG research is in its infancy. Early scientific work in QG focused on the effects of free radicals, citing that routine practice of QG significantly increased antioxidant activity (Peng, He, Zhang, Liu, & Xie, 1998). In pilot studies, QG has been shown to decrease nonmotor symptoms (Schmitz-Höbsch et al., 2006) and increase ability to cope with physical exercise in Parkinson's disease (Burini et al., 2006) as well as improve QOL in patients undergoing cancer treatment (Oh, Butow, Mullan, & Clarke, 2008). In several studies, QG has been shown to improve neck pain and disability (Lansinger, Larsson, Persson, & Carlsson, 2007; Rendant et al., 2011; Skoglund, Josephson, Wahlstedt, Lampa, & Norbäck, 2011). Other benefits include stress reduction in hospital staff (Griffith et al., 2008), increased positive mood and perceived pleasure and decreased state anxiety (Johansson & Hassmén, 2008), decreased tinnitus (Biesinger, Kipman, Schätz, & Langguth, 2010), and improvements in mild hypertension equal to conventional exercise (Cheung, 2005). Research has yielded mixed results in persons with fibromyalgia. One study noted significantly improved pain and psychological health (Haak & Scott, 2008), whereas another showed no significant improvements when QG was studied in combination with a form of body awareness therapy (Mannerkorpi & Arndorw, 2004). A combination of QG and group discussions resulted in improved self-reported physical activity, balance, and coordination in elderly patients undergoing cardiac rehabilitation (Stenlund, Lindström, Granlund, & Burell, 2005).

A few comprehensive reviews have been published on the effects of QG. A systematic review of the effects of QG on hypertension yielded preliminary evidence for the lowering of systolic blood pressure (M. S. Lee, Pittler, Guo, & Ernst, 2007). In a later meta-analysis of the effects of QG on hypertension, QG was found to be superior to no-treatment controls but not active treatment (Guo, Zhou, Nishimura, Teramukai, & Fukushima, 2008). QG for the treatment of type 2 diabetes as well as the palliative care of cancer patients did not yield adequate evidence to support its use (M. S. Lee, Chen, Choi, & Ernst, 2009; M. S. Lee, Chen, Sancier, & Ernst, 2007). Each of these reviews noted that the science was fraught with methodological issues.

Consistent with the current intervention, research has recently begun to appear in the literature integrating TC and QG. Combination interventions have been shown to decrease symptoms and increase activity levels in patients with chronic obstructive pulmonary disease (A. W. Chan, Lee, Suen, & Tam, 2010), improve balance in the elderly (Yang et al., 2007), and decrease osteoarthritis knee pain (H. J. Lee et al., 2009).

In an attempt to document the similarity between TC and QG, Jahnke and colleagues (2010) conducted a comprehensive review of the health benefits of both TC and QG. They reviewed 77 RCTs and found the most consistent positive results on bone health, QOL, self-efficacy, aspects of physical function, and factors related to falls and fall prevention. Results were mixed for a variety of other psychological and patient-reported outcomes.

In summary, there are a plethora of TC studies, including multiple critical reviews. Because much of the research, particularly earlier studies, were plagued with design issues such as small sample size and a variety of disease states and outcome variables, recent systematic reviews and meta-analyses have contributed significantly to clarifying when and how TC may be clinically useful as well as how to improve the rigor of future research. Although

there is a vast body of research, much of it has been done in older and elderly populations. Additionally, there is a paucity of studies focused on the use of these therapies for primary prevention. The body of research of the effects of QG is significantly smaller, but given similarities in philosophy, practice, and outcomes, it is reasonable to consider these practices essentially equivalent. This will help move the research and application of these practices forward.

Other critical issues interfering with the dissemination and application of TC and QG remain. These include use of multiple forms, the lack of standardized interventions, the absence of intervention details in published reports, and the complexity of TC and QG training. Additionally, there are very few studies that focus on primary prevention. Finally, although formal systems of energy-based medicine and therapies have existed for thousands of years, this worldview is relatively new to the West. In addition to uncertainty about the existence of energy or “chi” (“qi”), measurement of the effects of manipulating energy is not well developed. It is important to address these issues because TC and QG are cost-effective, low-risk activities with multiple physical and psychological potential benefits. Recent additions to the literature as well as the contribution of our intervention provide accessible, viable solutions.

TC and QG: Moving Meditations

The primary purpose of this article is to share the evolution of and introduce a unique TC intervention. In retrospect, developing a unique intervention served my research purposes but added yet another form to a body of research already plagued with a multitude of forms. In considering this, I discovered that the unique nature of our intervention is related to two things: (a) a holistic PNI model that encompasses investigation into the potential physical, psychological, and spiritual effects of TC and (b) a focus on cognitive appreciation of the meanings of the TC movements to enhance application in daily life and, ultimately, stress management. Otherwise, this form consists of authentic TC movements taught with a focus on the conscious use of breath and movement to enhance relaxation and mindfulness. I believe this story and intervention will contribute to the body of literature of TC and QG if it is integrated in a way that fosters forward progress.

Recently, a series of articles related to enhancing the dissemination of TC and related therapies have been published (Jahnke, Larkey, & Rogers, 2010; Jahnke, Larkey, Rogers, & Lin, 2010; Larkey, Jahnke, Etnier, & Gonzalez, 2009; Rogers, Larkey, & Keller, 2010). To this end, they have proposed a category of exercise called Moving Meditations (MM) that encompasses TC and QG as well as other related practices. They have developed required components for MM interventions and systematically reviewed the literature to elucidate the similarities in outcomes for TC and QG. In addition, they have reviewed the literature on perceived benefits of MM to identify benefits and motivational factors for practice initiation and adherence as well as pilot tested a specific intervention to make MM more accessible.

The MM required components are (a) the development of a focused mind through meditative practice; (b) flowing, gentle movements; (c) a focus on deep breathing; and (d) the achievement of deep relaxation (Larkey, Jahnke, Etnier, & Gonzalez, 2009). Although it is not included as a required component, they acknowledge a focus on “energy” as unique and integral to MM. Our intervention meets these MM criteria and includes a focus on energy. We believe our unique way of incorporating cognitive awareness of the meanings of the TC movements into our intervention, integrating our story into the current literature, ultimately making our intervention DVDs available to researchers as well as developing measures to assess the presence of MM components will increase dissemination, access, and application of TC and QG as MM practices.

Directions for Future Research

This unique TC intervention has been refined following the preliminary feasibility and accessibility pilot study and will be tested in an upcoming RCT to further assess its feasibility and acceptability as well as identify potential indicators of intervention effectiveness on impacting waist circumference and other psychoneuroimmunological variables thought to affect the development of CVD in women. This study has been funded as part of the Virginia Commonwealth University School of Nursing Center of Excellence for Biobehavioral Approaches to Symptom Management (P30 NR011403). Particular refinements have been outlined below.

Jahnke and colleagues (2010) outlined study design factors that yield mixed results. These include use of an exercise control group, selection of participants who do not demonstrate alterations at baseline in the outcome variables being studied, and participants with severe, chronic progressive illnesses. In prior research (Robins, Elswick, & McCain, 2011; Robins, Elswick, & McCain, 2011), women with increased waist circumference demonstrated significant alterations in the outcomes of interest in our study. Additionally, participants will not be experiencing severe, progressive illnesses. These authors also suggested that TC/QG practices may improve as well as slow the progression of chronic disease. The benefits may include delaying the onset of CVD in women with increased risk especially if instituted preventively, early in the trajectory of illness as this clinical trial seeks to do.

As noted in the appendix, the intervention previously included elements of music and guided imagery. Although beneficial to some participants, these added elements make it harder to evaluate the effects of the intervention. In the future, classes will begin with only focused breathing to help participants transition from the activity of the day to the quieter space of practice. This will enhance intervention integrity as well as the validity of study results.

According to expert practitioners, TC and QG are practices that are engaged in daily for optimal results. Additionally, limited research examining relative benefits of the “dose” of TC indicates that the more you physically practice, the more benefit you receive. Although this is likely true, there appears to be psychoemotional benefits even with less frequent physical practice, making these practices a potentially beneficial and efficient stress management strategy. These benefits may relate to the cognitive component in this intervention. Enjoyment of the practice has been evidenced in our prior studies based on participant feedback and documented in the literature (Jahnke, Larkey, & Rogers, 2010). Routine practice outside of class involves the willingness, ability, and time to incorporate a new behavior in addition to taking time out to come to class. Also, it is well known that incorporating and sustaining lifestyle changes is challenging and often fraught with failure. Adherence to routine practice has been a challenge for participants in each of our studies. An expectation will be set for future research participants encouraging them to engage in daily practice. Personal practice will be monitored with weekly practice logs to indicate the number of days and amount of time spent practicing. Strategies learnt from prior participants and the literature will be offered during and up to 8 weeks following the intervention to facilitate the adoption of this new behavior.

Based on participant feedback and attendance in our prior research as well as reports in the literature, an 8-week intervention is being pilot tested. Hopefully, this will increase recruitment and enrollment as well as class attendance. Although the current intervention is not outlined here, pending investigation of its feasibility and impact, it will include the TC movements outlined in the appendix. The sessions will be structured to include warm up, practice, then cool down, which is consistent with traditional TC/QG practice. QG stances and movements such as “Eagle Drying Her Wings” and “Heart’s Gentle Rock” have been

integrated based on their purported effects on cardiovascular health. The report of the results of the upcoming RCT will include full details of the intervention.

Conclusion

Telling the story of the evolution of this unique TC intervention has provided a clear picture of where We have been and where We am going. We have learned a great deal while designing and delivering these interventions. These lessons and clinical trial results combined with a reappraisal of the philosophy, practice, and research has yielded a stronger, more authentic, and adaptable TC/QG intervention.

Consistently the intervention has been well received by research participants and the cognitive component seems to be associated with psychoemotional benefits. The current clinical trial will provide insights from participants to develop strategies to increase practice frequency. Additionally, it will provide data on the impact of the intervention on a variety of PNI measures believed to be associated with the eventual development of CVD in women. It is anticipated the TC intervention will be available for dissemination in text and digital forms to researchers and clinicians following analysis of the results, ultimately contributing to the dissemination and application of these safe, well-received, low-cost, and beneficial practices.

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Appendix A. Tai Chi Intervention

Each class begins with background music, focused breathing, and a guided imagery exercise to help participants transition from the activity of the day to the quieter space of practice. Each movement begins and ends with the participant in a “grounding” followed by “centering” posture. The purpose of grounding is to end the movement and bring our attention fully to the present moment as well as make participants aware of the feel of their feet on the ground beneath them enhancing presence and a connection to the earth. The act of consciously centering was created to foster an awareness of our ability to remain “balanced” or self-referred in our responses to life experiences, to foster a more proactive and less reactive way of being.

Week 1: Introduction to Deep Diaphragmatic Focused Breathing and Tai Chi

Week 2: Tai Chi Bow

This movement encompasses several themes. It includes honoring where the individual is on their life's path, honoring others as well as a higher power. The concepts of yin and yang manifest in the motion of stepping out into the world and retreating back, or inside, once one's work is done. The hands create a triangle by touching together the index fingers and thumbs and moving this open space or vessel from the sky above to the earth below—a

reminder that we have inspiration (above) for manifestation (below) of what we want and need in our lives.

Week 3: Embrace Tiger, Return to Mountain

This movement embodies the knowledge that situations can lead to feelings of fear (tiger) that we may not feel able to overcome. It reminds us that we also have the capacity to bring up this fear, surrounding and transforming it with love, to return to a place of peace (mountain). It allows us the opportunity to revisit those issues we have found it difficult to face and find a different resolution or way of considering them. This was likely the favorite movement of the participants in the study.

Week 4: Gathering Earth and Heaven (or Sky) Energy

Reinforces the ideas of inspiration and manifestation introduced in the tai chi bow. It also fosters feelings of connection to something greater—the earth and the sky. This is a powerful yet simple movement that is easily paired with breath to enhance the skill of the conscious use of breath and movement to foster relaxation and mindfulness.

Week 5: Yin and Yang Moving Meditation

Expands on the concepts of yin and yang as introduced in the tai chi bow.

Yin is introduced as the sacred feminine, the moon, night time. It is relaxed, cool, still, quiet, contemplative, and serene. Yin is about *being*. **Yang** is introduced as the masculine, the sun, daytime. It is tense, hot, active, and aggressive. Yang is about *doing*. One is understood in relation to the other. To know cold, one must know hot. To know dark, one needs to have experienced light. In this way, it is easy to appreciate that both are part of life. Everything in life can be explained in terms of these two complementary and opposing forces. The symbol of yin and yang, as known in the West, is actually the ancient symbol of the “tao.” In eastern philosophy, particularly Taoism, *the tao is all there is*. The symbol is circular, showing the flow of one force into the other.

In modern Western culture, the active qualities of yang are often more valued than those of yin. Our emphasis on activity and production and devaluation of stillness and quiet are one example. This can create an imbalance in individuals. This oversimplified, yet accurate, explanation of a complex and ancient philosophy gave study participants a way to contemplate balance in their daily lives. It helps explain why, perhaps, we should not be doing at 10 p.m. what we were doing at 10 a.m.

Week 6: Smoothing the Waters

This is a simple, repetitive movement that relaxes the neck and shoulders and fosters deep breathing. It focuses on our ability to smooth conflicts and the rough edges in our lives. One participant reported using it with her young children when they were fighting. She would stand them facing each other then literally or figuratively lay what they were arguing over at their feet. They would then practice the movement until they could release the conflict.

Week 7: Parting the Clouds

This movement involves moving the arms in a way similar to parting a curtain. It demonstrates one’s ability to “part the clouds” in order to gain greater clarity. This movement is simple and one variation is taught involving stepping first to the right three steps then back to the right three steps while incorporating the breath and arm movements.

Week 8: Carrying the Ball of Energy and Tai Chi Walk

These movement are learned quickly so are taught in the same class. Carrying the Ball of Energy enhances one's awareness of the presence of chi and has several easy variations. Begin by clapping the hands together and rubbing briskly, parting the hands about 12 inches, then bringing them slowly together until slight resistance is felt. The space that remains between the hands is the "Ball of Energy." The ball of energy is held comfortably in front of the waist then used to trace a side lying figure 8 or "infinity" symbol in front of the body. Variations include circling the ball overhead and down toward the floor as well as stepping forward with first one foot then the other while still breathing and moving the ball in a figure 8. The Tai Chi Walk is simply mindful walking and can be done anywhere to create a sense of relaxation. Participants are taught to focus on breathing and to walk slowly and intentionally placing first the heel then the toe as they walk in any pattern or direction they choose while simply observing the sensations of mindful walking.

Week 9: Combine All Movements to Practice Continuous Form

Finally, all the movements are combined together to create a continuous "form." The form progresses from one movement directly into the next without the break for grounding and centering. This emphasizes flow and allows for a longer continual practice time. More traditional forms of tai chi are practiced in this way.

Week 10: Review. Combine All Movements to Practice Continuous Form; Group Closure

Tai Chi Intervention in Women Experiencing Breast Cancer

This intervention included the above movements and also incorporated the more complex Five Elements form.

Five Elements

This movement combines "embrace tiger, return to mountain" with additional movements of the feet and arms allowing the participant to face each of the four cardinal directions (north, east, south, and west). Each direction relates to a season of the year, north/winter, east/spring, south/summer, and west/autumn. This movement reminds us of the continual cycles of transformation in our lives. The 5 elements are wood, fire, earth, metal, and water. They represent ongoing cycles of transformation. Wood is transformed by fire into earth, the earth gives rise to minerals, minerals become water, and water nourishes wood completing the supporting cycle of life.

Tai Chi Intervention in Women With Increased CVD Risk

This intervention encompasses all the above except Carrying the Ball of Energy and the Tai Chi walk because these movements were not generally well received in prior studies and to provide time and space for incorporating QG movements in a shorter intervention. To decrease participant burden, given the amount of data collected in the current RCT, the intervention was shortened to 8 weeks.

Each class begins with Sitting Forgetfulness Meditation and a body scan; then *QG Warm Up Exercises*:

Thymus tap to energize and nourish the thymus and immune system

Kidney rub to energize and nourish the adrenal glands *Spinal stretch* to energize and nourish the spine *Tongue roll* to benefit the heart because the tongue and heart muscles are connected

The intervention also includes the following QG stances: Hugging the Tree and Eagle Drying Her Wings.

The intervention includes the following addition QG movement: *Heart's Gentle Rock*.

Finally, the intervention includes the following *Cool Down Exercises*:

Ren Chong breathing meditation focuses the breath to nourish the blood and promote healthy circulation

Back of head and neck rubdown to quiet the mind for focused breathing and class closure

Table 1

Demographic and Lifestyle Variables

Race	55% African American (n = 11); 45% White (n = 10)
Age	44.8 years (<i>SD</i> = 9.19)
Mean waist circumference	36.5 inches (<i>SD</i> = 6.06)
Obesity	33% (<i>n</i> = 6/20)
Coronary heart disease	5% (<i>n</i> = 1/20)
Diabetes mellitus	5% (<i>n</i> = 1/20)
Hyperlipidemia	10% (<i>n</i> = 2/20)
Clinical depression	33% (<i>n</i> = 6/19)
Family history of cardiovascular disease	70% (<i>n</i> = 14/20)
Smokers	10% (<i>n</i> = 2/20)
Exercise	75% exercise at least 15 minutes per session
Days of exercise weekly	2.2 (<i>SD</i> = 2.06)
Employed full-time	65% (<i>n</i> = 13/20)
Prescription medication use	70% (<i>n</i> = 14/20)
Use of over-the-counter preparations	66% (<i>n</i> = 12/18)
Vitamin use	60% (<i>n</i> = 12/20)
Supplements other than vitamins	25% (<i>n</i> = 5/20)
Post-high school education	95% (<i>n</i> = 19/20)
Average daily fruit and vegetable intake	3.05 (<i>SD</i> = 1.58)