

## **Know the Evidence Update- 2019**

### **A report of the NQA Research and Education Committee**

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#### **Introduction**

The paper that serves as the foundational document for this [report was created in 2017](#). It discussed the available research through May 2017, limiting commentary to the most current systematic reviews and meta-analyses, as well as key major studies. This current update follows the same format and will discuss systematic reviews, meta-analyses, and key major studies from June 2017 through December 2019.

#### **Clinical Research Evidence**

The following addresses the evidence base (June 2017 through Dec 2019) assessing therapeutic benefits of Qigong/tai chi practice by clinical area.

#### **Balance and Fall Prevention**

Tai chi and qigong continue to prove to be one of the most effective interventions for improving balance and reducing falls.

Lomas-Varga et al. investigated the effects of tai chi/qigong for the risk of falls. They identified 10 studies which met inclusion criteria. Based on their review, they found that tai chi/qigong practice may reduce the rate of falls by approximately 43%, and injury-related falls by approximately 50% over the short term (<12 months) in at-risk adults and older adults. At long term follow-up (> 12 months), falls risk was reduced by approximately 13% and injurious falls risk reduction was reduced by approximately 28%.

Lomas-Vega R, Obrero-Gaitán E, Molina-Ortega FJ, Del-Pino-Casado R. *Tai chi for Risk of Falls. A Meta-analysis.* J Am Geriatr Soc. 2017 Sep;65(9):2037-2043.

A randomized controlled trial By Li and colleagues in 2018 compared the effectiveness of tai chi/qigong to a multimodal exercise intervention to determine their effectiveness in preventing falls in community dwelling older adults who were at higher risk. There were initially 670 participants randomized into one of three groups- therapeutic tai chi/qigong, multimodal exercise consisting of aerobics, strengthening, and flexibility exercises, or stretching exercises. Upon completion, 583 participants remained. Compared to the other two groups, the tai chi/qigong group showed a significantly lower incidence of falls at three months and six months post intervention. In addition, the tai chi/qigong and multi-modal exercise groups both showed a

significant increase in physical and cognitive performance function scores compared to the stretching group.

Li F, Harmer P, Fitzgerald K, Eckstrom E, Akers L, Chou LS, Pidgeon D, Voit J, Winters-Stone K. *Effectiveness of a Therapeutic Tai Ji Quan Intervention vs a Multimodal Exercise Intervention to Prevent Falls Among Older Adults at High Risk of Falling: A Randomized Clinical Trial*. JAMA Intern Med. 2018 Oct 1;178(10):1301-1310

Huang and colleagues examined the effects of tai chi on balance disorders. They examined four studies involving 134 participants. Control groups included balance education and awareness and balance training. Although the authors concluded that tai chi improves dynamic balance control and flexibility of individuals with balance and vestibular disorders, there is a need for more high quality studies with an increased number of participants.

Huang HW, Nicholson N, Thomas S. *Impact of Tai Chi Exercise on Balance Disorders: A Systematic Review*. Am J Audiol. 2019 Jun 10;28(2):391-404

The effects of tai chi on lower extremity proprioception in adults over the age of 55 were reviewed by Zou and et al. in 2019. They examined 11 trials. Control groups consisted of normal exercise, walking, stretching, and golf. Compared to control groups, participants in the tai chi groups demonstrated significant improvements in ankle and knee proprioception- both key areas for balance training and fall prevention. Authors concluded that tai chi is a safe exercise to enhance balance and prevent falls in this population which may be vulnerable.

Zou L, Han J, Li C, Yeung AS, Hui SS, Tsang WWN, Ren Z, Wang L. *Effects of Tai Chi on Lower Limb Proprioception in Adults Aged Over 55: A Systematic Review and Meta-Analysis*. Arch Phys Med Rehabil. 2019 Jun;100(6):1102-1113

## **Cancer Care**

The body of evidence that supports the use of tai chi/qigong in cancer care continues to grow.

In 2018, Song and colleagues performed a meta-analysis of six randomized controlled trials (RCTs) involving 373 patients which investigated the effects of tai chi/qigong on cancer related fatigue (CRF). Their results showed that tai chi/qigong practice for greater than eight weeks has short term ameliorative effects on CRF, and is superior to physical exercise and psychological support. The results on long term CRF was inconclusive as only two studies reported results. The results were more pronounced in those with breast and lung cancer.

Song S, Yu J, Ruan Y, Liu X, Xiu L, Yue X. *Ameliorative effects of tai chi on cancer-related fatigue: a meta-analysis of randomized controlled trials*. Support Care Cancer. 2018 Jul;26(7):2091-2102

A systematic review and meta-analysis was performed on tai chi/qigong for cancer related symptoms and quality of life by Wayne et al. in 2018. They reviewed 22 studies, including 15 RCTs that evaluated 1283 participants. Comparison groups involved active interventions such as stretching, light exercise, or health education, and usual care. Duration of training lasted from three to 12 weeks. The authors reported significant improvement in fatigue, sleep difficulty, depression, and overall QOL. There was also a non-significant trend for improvement in pain. The authors also reported that their results paralleled other recent reviews, however this recent report differs in that it included additional recent studies and expanded on outcomes reported.

Wayne PM, Lee MS, Novakowski J, Osypiuk K, Ligibel J, Carlson LE, Song R. *Tai chi and qigong for cancer-related symptoms and quality of life: a systematic review and meta-analysis*. J Cancer Surviv. 2018 Apr;12(2):256-267

A systematic review by Van Vu and colleagues in 2017 measured the effects of qigong on symptom management in patients with cancer. Symptoms/outcomes reviewed included: fatigue, sleep disturbance, pain, depression, anxiety, dyspnea, strength, digestive function, mood disturbance, neuropathy symptoms, overall quality of life, vital capacity, and body mass index (BMI). Studies reviewed were from various countries and not limited to the English language. More than nine different types of cancer were reported on, with the most frequent being breast cancer. No side effects or adverse events were reported in any of the studies. The authors reported that some studies reported a significant improvement in symptoms compared to controls, and others reported a positive trend in symptoms from pre-intervention to post-intervention.

Van Vu D, Molassiotis A, Ching SSY, Le TT. *Effects of qigong on symptom management in cancer patients: A systematic review*. Complement Ther Clin Pract. 2017 Nov;29:111-121

A systematic review by Wu et al. in 2019 reviewed non-pharmacological interventions for cancer related fatigue. They examined 182 studies, including over 18,000 patients. Of the interventions studied, they concluded that qigong is among one of the top three interventions for treating cancer related fatigue. Additional highly ranked interventions included cognitive behavioral therapy and multi-modal therapy (combination of one or more interventions).

Wu C, Zheng Y, Duan Y, Lai X, Cui S, Xu N, Tang C, Lu L. *Nonpharmacological Interventions for Cancer-Related Fatigue: A Systematic Review and Bayesian Network Meta-Analysis*. Worldviews Evid Based Nurs. 2019 Apr;16(2):102-110

In 2019, Ying and colleagues reported on the health effects of baduanjin in breast cancer survivors. The participants were randomized into the intervention group (46), or the control group (40). The intervention group performed baduanjin three times per week in a class with home practice, and the control group was instructed to carry on usual activity. After a six-month intervention, the qigong group demonstrated significant improvements in heart rate variability, shoulder range of motion, depression, and quality of life scores pertaining to physical well-being, social well-being, functional well-being, and a breast cancer subscale. The authors concluded that baduanjin may be a safe and effective intervention in those with breast cancer.

Ying W, Min QW, Lei T, Na ZX, Li L, Jing L. *The health effects of baduanjin exercise (a type of qigong exercise) in breast cancer survivors: A randomized, controlled, single-blinded trial.* Eur J Oncol Nurs. 2019 Apr;39:90-97

### **Neurological Conditions**

Several authors reported on the effects of qigong and tai chi and various conditions in people who have had a stroke. There were limited published papers during this time frame pertaining to other neurological conditions.

Ge and colleagues reported on the effects of qigong and tai chi on rehabilitation of limb function in patients who have had a stroke. They examined 31 randomized controlled trials, involving 2349 participants. Control interventions consisted of rehabilitation therapies, acupuncture, weekly phone calls, and health guidance. The studies reported on limb motor function, balance function, ADL ability, physical function, and neurological impairment. Twelve of the studies measured limb motor function using the Fugl-Meyer Assessment which is designed to assess motor functioning, balance, sensation and joint functioning in patients with post-stroke hemiplegia. Results showed that patients who received qigong or tai chi demonstrated significant improvements in both upper and lower limb assessments compared to control groups. Twenty-six of the studies reported on balance function. Nineteen studies reported results using a Berg Balance Score, and four studies used a Timed Up and Go (TUG) test. They all reported a significant improvement in the Qigong and tai chi groups compared to control groups. Three studies reported balance outcomes using the Fugl Meyer Balance scale, but reported no significant differences between groups. Eleven studies involving 827 participants reported Activity of Daily Living (ADL) abilities using the Barthel Index. They revealed a significant improvement in ability to complete all ADL's in the Qigong and tai chi groups compared to control groups. And finally, two studies which involved 327 participants reported on neurological impairment as reported by the NIH Stroke Scale. They also revealed significant

improvements in neurological function in both the qigong and tai chi groups, compared to control groups.

Ge L, Zheng QX, Liao YT, Tan JY, Xie QL, Rask M. *Effects of traditional Chinese exercises on the rehabilitation of limb function among stroke patients: systematic review and meta-analysis*. *Complement Ther Clin Pract*. 2017 Nov;29:35-47

Li et al. reported on the effects of tai chi on balance and gait in stroke survivors. Five studies, totaling 346 patients revealed that the tai chi group exhibited a significantly better gait ability than the control group, as evaluated with the TUG test and Short Physical Performance Battery (SPPB), but no significant difference in dynamic standing balance scores was found between tai chi and control groups. Wu and colleagues reported similar results in their report of 6 studies, with 347 patients. Their findings showed that there were significant improvements of balance on Berg Balance Scale score, the standing balance with fall rates, functional reach test and dynamic gait index in tai chi intervention group compared to the control intervention group. However, the SPBB showed tai chi did not significantly improve balance for stroke patients.

Li GY, Wang W, Liu GL, Zhang Y. *Effects of Tai Chi on balance and gait in stroke survivors: A systematic meta-analysis of randomized controlled trials*. *J Rehabil Med*. 2018 Jul 17;50(7):582-588.

Wu S, Chen J, Wang S, Jiang M, Wang X, Wen Y. *Effect of Tai Chi Exercise on Balance Function of Stroke Patients: A Meta-Analysis*. *Med Sci Monit Basic Res*. 2018 Dec 3;24:210-215.

Lauche and colleagues examined the efficacy of tai chi and qigong for the prevention of stroke and stroke risk factors. They examined 21 trials consisting of 1604 participants with hypertension, hyperlipidemia, diabetes, overweight or obesity, or metabolic syndrome. Although their search did not reveal any trials examining the effects of tai chi/qigong on the primary prevention of stroke, they did reveal trials which examined the effects of tai chi and qigong on risk factors. In regards to hypertension (high blood pressure), their review found that tai chi/qigong may significantly reduce blood pressure, with average reductions of 15.55mm Hg systolic and 10.66mm Hg diastolic blood pressure when compared with no intervention. They also found that these effects might be larger than those reported for aerobic exercise with reductions of 7mm Hg systolic and 5mm Hg diastolic blood pressure. They also found minimal benefits of Tai Chi/Qigong over no intervention, usual care, and exercise in the management of diabetes and weight control (BMI).

Lauche R, Peng W, Ferguson C, Cramer H, Frawley J, Adams J, Sibbritt D. *Efficacy of Tai Chi and qigong for the prevention of stroke and stroke risk factors: A systematic review with meta-analysis*. *Medicine (Baltimore)*. 2017 Nov;96(45):e8517

Finally, Winser et al. conducted a review and meta-analysis to determine the effectiveness of tai chi in reducing falls and improving balance among those with neurological disorders. They identified 10 studies involving 720 participants. Seven of the studies pertained to subjects with Parkinson's Disease, and three reported on participants who have had a stroke. From the results of their investigation, they concluded that tai chi is effective in reducing falls incidence in Parkinson's disease and stroke. Meta-analyses of balance measured with the Timed Up and Go Test in Parkinson's disease revealed improvements of tai chi compared to no treatment, as well as active treatment. Tai chi significantly reduced falls incidence in Parkinson's disease and stroke. Balance measured with the Timed Up and Go Test comparing tai chi and active treatment revealed a small, but insignificant effect in stroke.

Winser SJ, Tsang WW, Krishnamurthy K, Kannan P. *Does tai chi improve balance and reduce falls incidence in neurological disorders? A systematic review and meta-analysis.* Clin Rehabil. 2018 Sep;32(9):1157-1168

## Psychological Health

One of the most investigated areas over the last two years is the effects of tai chi and qigong on psychological health.

Guo and colleagues reported on the effects of qigong on adults with major depressive disorder. In reviewing seven randomized controlled trials with 382 participants, they concluded that the practice of Qigong significantly reduces depression severity compared to both active and passive control groups. The practice of qigong also produced significant improvements in response and remission rates over both active and passive control groups.

Guo L, Kong Z, Zhang Y. *Qigong-Based Therapy for Treating Adults with Major Depressive Disorder: A Meta-Analysis of Randomized Controlled Trials.* Int J Environ Res Public Health. 2019 Mar 7;16(5)

Zheng et al. examined the effects of Tai Chi on Mild Cognitive Impairment (MCI). Though their results only yielded three trials, they found that tai chi is beneficial for cognitive function, maintaining memory strategies, processing speed, and visual attention.

Zheng W, Xiang YQ, Ungvari GS, Chiu HFK, Ning YP, Yu X, Forester BP, Xiang YT. *Tai chi for mild cognitive impairment: a systematic review.* Psychogeriatrics. 2017 Nov;17(6):514-516

A study by Siu and Lee examined the effects of tai chi on cognition and ability to complete activities of daily living in community dwelling older adults with MCI. There were 145 participants- 74 in the intervention group and 71 in the control group. The tai chi group practiced

for one hour, two times per week for 16 weeks. The control group continued with usual care. Results showed that those who practiced tai chi demonstrated significant improvements in cognitive function and abilities to complete all daily activities compared to those in the control group.

Siu MY, Lee DTF. *Effects of tai chi on cognition and instrumental activities of daily living in community dwelling older people with mild cognitive impairment.* BMC Geriatr. 2018 Feb 2;18(1):37.

Zhang and colleagues examined the effects of tai chi on negative emotions in non-clinical populations. Their review consisted of 14 trials involving 1285 participants with anxiety and/or depression. Tai chi styles were varied, and interventions ranged from 10 minutes to 18 months. Control groups included aerobic exercise and wait lists. Results of their study showed that tai chi significantly improved symptoms and effects of anxiety and depression in seemingly healthy younger and older adults. Interestingly, older adults experienced more of a benefit than younger adults. The authors concluded that “tai chi is a worthy complementary non-pharmacological resource towards depression and anxiety and, thus, has great implications for the public health domain.

Zhang S, Zou L, Chen LZ, Yao Y, Loprinzi PD, Siu PM, Wei GX. *The Effect of Tai Chi Chuan on Negative Emotions in Non-Clinical Populations: A Meta-Analysis and Systematic Review.* Int J Environ Res Public Health. 2019 Aug 21;16(17)

## **Pulmonary Health**

Wu and colleagues examined the effect of qigong on self-rating depression and anxiety scale scores of patients with COPD. In a review of six studies examining 415 patients, they determined that combined with traditional therapy alone, qigong in combination with therapy significantly improved the self-rating depression scale, self-rating anxiety scale, Forced Expiratory Volume in One Second and Forced Vital Capacity (tests of lung function), Six Minute Walk Test Distance, and St. George’s Respiratory Questionnaire Total Score.

Wu JJ, Zhang YX, Du WS, Jiang LD, Jin RF, Yu HY, Liu JM, Han M. *Effect of Qigong on self-rating depression and anxiety scale scores of COPD patients: A meta-analysis.* Medicine (Baltimore). 2019 May;98(22):e15776

Similarly, Liu and colleagues conducted a systematic review and meta-analysis of 20 studies, involving 1975 patients. They examined the effects of baduanjin on COPD. They also determined that baduanjin is effective in improving exercise capability, Forced Expiratory Volume in One Minute, Forced Vital Capacity, and the quality of life of COPD patients as compared to control groups. They concluded that baduanjin exercise could be tentatively

prescribed for COPD in combination with the conventional rehabilitation program to quicken the process of recovery.

Liu SJ, Ren Z, Wang L, Wei GX, Zou L. *Mind-Body (Baduanjin) Exercise Prescription for Chronic Obstructive Pulmonary Disease: A Systematic Review with Meta-Analysis*. *Int J Environ Res Public Health*. 2018 Aug 24;15(9)

In 2018, Polkey and colleagues conducted a randomized controlled trial to examine the effects of tai chi and pulmonary rehabilitation on patients with Chronic Obstructive Pulmonary Disease (COPD). One hundred and twenty participants were involved. The intervention lasted 12 weeks and consisted of pulmonary rehabilitation three times per week or Tai Chi five times per week. Both treatments resulted in significant improvements in patient's subjective reporting as measured by the St. George's Respiratory Questionnaire (SGRQ), Six-Minute Walking Distance, quadricep strength, and dyspnea scores. However, the tai chi group continued to show significant improvements in all areas as compared to the pulmonary rehabilitation group 12 weeks after the interventions had ended. The authors concluded that tai chi may be as effective as traditional pulmonary rehabilitation programs, and may also provide longer lasting benefits.

Polkey MI, Qiu ZH, Zhou L, Zhu MD, Wu YX, Chen YY, Ye SP, He YS, Jiang M, He BT, Mehta B, Zhong NS, Luo YM. *Tai Chi and Pulmonary Rehabilitation Compared for Treatment-Naive Patients With COPD: A Randomized Controlled Trial*. *Chest*. 2018 May;153(5):1116-1124

Tong and colleagues reviewed 10 trials consisting of 993 participants with COPD. Qigong interventions included Baduanjin, Yi Jin Jing, and Liuzijue. Several studies combined qigong with medication as the study group. Control interventions included medications, walking, routine activity, and conventional rehabilitation. Intervention periods ranged from six months to one year. Compared to control groups, participants in the qigong groups demonstrated significant improvements in 6-minute walk test distance, Forced expiratory Volume in one second, Forced Vital Capacity in one second, objective functional outcome measures, subjective functional outcome measures, and several quality of life measures. The authors concluded that qigong can safely improve lung function, exercise and activity performance, and quality of life in those with COPD.

Tong H, Liu Y, Zhu Y, Zhang B, Hu J. *The therapeutic effects of qigong in patients with chronic obstructive pulmonary disease in the stable stage: a meta-analysis*. *BMC Complement Altern Med*. 2019 Sep 4;19(1):239.

## Diabetes

Xia et al. completed a systematic review and meta-analysis of 17 trials, examining the effects of different training styles and duration of tai chi practice on glucose control for those with type 2 diabetes. In a subgroup analysis, the results showed that 24 movements or Yang style tai chi did not significantly reduce FBG after a duration of  $\leq$  three months or  $>$  three months, nor did it reduce HbA1c after a duration  $>$  three months in all studies. However, other styles of tai chi significantly reduced FBG and HbA1c after a duration  $>$  three months, while no significant reduction in FBG or HbA1c was found after a duration  $\leq$  three months. The interventions in the control group, which included standard diabetes care (diet control, injection of insulin or anti-diabetic medication, and usual care), active control (jogging, brisk walking, Yangko or social dancing for exercise, and other aerobic exercises), and no treatment (free activity program, wait list). Tai chi styles included simplified Tai Chi, Yang-style, Chen-style, Sun-style and Yang-style combined, Lin-style, Da Yuan Jiang Tang-style, and Tai Chi Ball. Two trials did not report the tai chi style used.

Xia TW, Yang Y, Li WH, Tang ZH, Li ZR, Qiao LJ. *Different training durations and styles of tai chi for glucose control in patients with type 2 diabetes: a systematic review and meta-analysis of controlled trials*. BMC Complement Altern Med. 2019 Mar 14;19(1):63

Chao and colleagues reviewed 14 studies involving 798 individuals and found that tai chi can effectively impact the management of blood glucose and HbA1c in patients with type-2 diabetes mellitus, and that long-term adherence to tai chi has a better role in reducing blood glucose and HbA1c in patients.

Chao M, Wang C, Dong X, Ding M. *The Effects of Tai Chi on Type 2 Diabetes Mellitus: A Meta-Analysis*. J Diabetes Res. 2018 Jul 5;2018

In 2019, Zhou et al. published a meta-analysis of the effects of tai chi on physiology, balance, and quality of life in those with Type II Diabetes Mellitus. They included 23 studies involving 1235 participants. Outcomes included fasting blood glucose, HbA1c, insulin resistance, body mass index, blood pressure, total cholesterol, fasting insulin, and outcome measures relating to physical function, pain, and social interaction. Control groups consisted of usual care, and interventions ranged from 4 to 24 weeks. Significant improvements were noted in every outcome studied in favor of the tai chi groups with the exception of fasting insulin. The authors concluded that tai chi may be a safe and effective intervention for people with Type II Diabetes Mellitus.

Zhou Z, Zhou R, Li K, Zhu Y, Zhang Z, Luo Y, Luan R. *Effects of tai chi on*

*physiology, balance and quality of life in patients with type 2 diabetes: A systematic review and meta-analysis.* J Rehabil Med. 2019 Jun 18;51(6):405-417

### **Bone Mineral Density**

Zou and colleagues conducted a meta-analysis and systematic review to determine the effect of practicing tai chi on reducing bone mineral density (BMD) loss. Twenty eligible studies were analyzed, consisting of 1604 participants. Their results showed a significant effect of tai chi practice of > 24 weeks on BMD at the lumbar spine, femoral neck, femoral trochanter, and total hip BMD, including special populations such as older adults, perimenopausal and postmenopausal women, people with osteoarthritis, and cancer survivors.

Zou L, Wang C, Chen K, Shu Y, Chen X, Luo L, Zhao X. *The Effect of Tai Chi Practice on Attenuating Bone Mineral Density Loss: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.* Int J Environ Res Public Health. 2017 Sep 1;14(9)

### **Cardiovascular Health**

Liu and colleagues examined the effect of tai chi-based cardiac rehabilitation on aerobic endurance, psychosocial well-being, and cardiovascular risk reduction among patients with coronary heart disease. They reviewed 13 trials, consisting of 972 patients with coronary heart disease. They found that tai chi groups showed a large and significant improvement in aerobic endurance compared with both active and non-active control interventions. Tai chi groups also showed a significantly lower level of anxiety and depression, and significantly better quality of life compared with non-active control groups. They concluded that tai chi could be a cost-effective and safe exercise option in cardiac rehabilitation. However, the effect of tai chi on cardiovascular disease risk reduction warrants further research.

Liu T, Chan AW, Liu YH, Taylor-Piliae RE. *Effects of Tai Chi-based cardiac rehabilitation on aerobic endurance, psychosocial well-being, and cardiovascular risk reduction among patients with coronary heart disease: A systematic review and meta-analysis.* Eur J Cardiovasc Nurs. 2018 Apr;17(4):368-383

Alenazi and colleagues conducted a systematic review and meta-analysis of the effects of tai chi on lipid profiles. A total of 8 studies involving 1266 patients were reviewed. The primary diagnoses and patient populations varied among the studies in terms of ages, activity levels, BMI, levels of health, etc. Tai chi intervention periods lasted from 3-12 months, with a mix of active and passive control groups. Although the sample was small, the results indicated that tai chi demonstrated a positive effect on high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and total cholesterol (TC).

Alenazi AM, Alshehri MM, Hoover JC, Yabroudi MA, Kachanathu SJ, Liu W. *The Effect of T'ai Chi Exercise on Lipid Profiles: A Systematic Review and Meta-Analysis of Randomized Clinical Trials*. *J Altern Complement Med*. 2018 Mar;24(3):220-230

In 2018, Chan and colleagues conducted a randomized controlled trial to compare tai chi to brisk walking in regards to their effects on reducing cardiovascular disease risk factors in adults with high blood pressure. There were 246 participants divided into three equal groups of tai chi, brisk walking, and a control group consisting of routine activity. Compared to the control group, tai chi significantly lowered blood pressure, fasting blood sugar, glycated haemoglobin and perceived stress, and improved perceived mental health and exercise self-efficacy at nine months. Compared to the brisk walking group, the tai chi group showed significantly greater reductions in blood pressure, fasting blood sugar, glycated haemoglobin, lower perceived stress, and improved perceived mental health and exercise self-efficacy.

Chan AWK, Chair SY, Lee DTF, Leung DYP, Sit JWH, Cheng HY, Taylor-Piliae RE. *Tai Chi exercise is more effective than brisk walking in reducing cardiovascular disease risk factors among adults with hypertension: A randomised controlled trial*. *Int J Nurs Stud*. 2018 Dec;88:44-52

### **Musculoskeletal / Pain**

Zou et al. examined the effects of Baduanjin exercise for its therapeutic effects on musculoskeletal pain or insomnia in individuals with chronic conditions. Twenty-eight studies were identified of which 4 were in English, and 24 were in Chinese. There were a total of 1787 subjects, ranging in age from 15 to 80. Chronic disease conditions included insomnia, body pain (shoulder, neck, and/or back), periarthritis, ankylosing spondylosis, lumbar disc herniation, osteoporosis, type 2 diabetes mellitus, radiculopathy, Parkinson's disease, chronic fatigue syndrome, and hypertension. A majority of the studies involved active control groups. Intervention times ranged from two weeks to six months, with two to seven sessions per day in a week. A typical session lasted between 30 min to 90 min. The number of total sessions in an individual study ranged from nine to 336, while the total session time ranged from seven to 120 hours. Two studies reported follow-up assessments at three months and six months respectively, to track long term effects of Baduanjin on participants' pain and/or sleep quality improvement. Results of this review suggested that the practice of Baduanjin reduces musculoskeletal pain and improves sleep quality among patients with chronic illnesses.

Zou L, Yeung A, Quan X, Boyden SD, Wang H. *A Systematic Review and Meta-Analysis of Mindfulness-Based (Baduanjin) Exercise for Alleviating Musculoskeletal Pain and Improving Sleep Quality in People with Chronic Diseases*. *Int J Environ Res Public Health*. 2018 Jan 25;15(2)

Girard and Girard examined the effects of qigong on individuals with neck pain. Five studies were identified, involving 525 subjects. They ranged in age from 35 to 84. All five studies included exercise therapy as a control intervention. The authors concluded that qigong has a significant effect on pain and neck-related disability. However, similar results were also seen in exercise therapy control groups. qigong may provide individuals with neck pain an alternative to traditional exercise therapy as an intervention to relieve their neck pain and disability.

Girard J, Girard A. *The effects of qigong on neck pain: A systematic review*. *Complement Ther Clin Pract*. 2019 Feb;34:23-29

In 2018, You et al. performed a randomized controlled trial of the effects of tai chi for older adults with chronic pain. Fifty-four participants were enrolled into either a 12 week tai chi class or a 12 week light exercise class. Participants were adults aged  $\geq 65$  with multisite pain who reported falling in the past year or current use of an assistive device. Compared to the light exercise group, the tai chi group showed significant improvements in pain severity, pain interference with activities, reduced fear of falling, and improvement in several single-task and dual-task gait variables.

You T, Ogawa EF, Thapa S, Cai Y, Zhang H, Nagae S, Yeh GY, Wayne PM, Shi L, Leveille SG. *Tai Chi for older adults with chronic multisite pain: a randomized controlled pilot study*. *Aging Clin Exp Res*. 2018 Nov;30(11):1335-1343

Cheng and colleagues examined the effects of tai chi on people with fibromyalgia. They examined six studies consisting of 657 participants. Control interventions consisted of conventional exercise or standard care. Outcomes were measured using the Fibromyalgia Impact Questionnaire (FIQ) and other measures. Results showed that when compared to controls, the practice of tai chi significantly improved all areas measured, including pain, sleep quality, fatigue, depression, physical quality of life, and psychological quality of life. The authors suggested that the practice of tai chi is a safe and effective alternative to traditional treatment for fibromyalgia.

Cheng CA, Chiu YW, Wu D, Kuan YC, Chen SN, Tam KW. *Effectiveness of tai chi on fibromyalgia patients: A meta-analysis of randomized controlled trials*. *Complement Ther Med*. 2019 Oct;46:1-8

Finally, Qin et al. reviewed the effectiveness of tai chi alone or as an additional therapy on individuals with low back pain. They reviewed 10 studies involving 959 people. Intervention periods ranged from 3 - 24 weeks and of the 10 studies, five reported using Chen style tai chi and the remaining five did not report. Control interventions included physical therapy, massage, routine care, and health education. Results showed that tai chi alone or as an additional treatment were effective in reducing pain and improving functional outcomes in those with low

back pain. The authors concluded that tai chi may be a safe, inexpensive, convenient option to help people recover from low back pain.

Qin J, Zhang Y, Wu L, He Z, Huang J, Tao J, Chen L. *Effect of Tai Chi alone or as additional therapy on low back pain: Systematic review and meta-analysis of controlled trials*. *Medicine (Baltimore)*. 2019 Sep;98(37):e17099

## Summary

It is apparent that there is more and more evidence for tai chi and qigong being beneficial for a number of health conditions. Given that tai chi and qigong are systematic in their mechanism, they tend to impact the balance of the whole body, providing support for the entire metabolic system in order to improve health. While no one knows the exact mechanism of the benefits, and few researchers have posed a hypothesis, tai chi and qigong have demonstrated positive effects on all major systems (respiratory, digestive, metabolic, neurological, lymphatic, cardiac, etc.).

There is still a great deal that can be done to improve the strength of the supporting research; larger studies, higher rigor, increased documentation of the exact style/type of tai chi and qigong practiced as well as duration, frequency, and other dosage-type information. But there can be no doubt that as an integrative health practice (in conjunction with standard medical practices) tai chi and qigong can make a positive impact to a wide variety of health problems.

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