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The Effects of Tai Chi on Healthy Aging and Quality of Life in Seniors

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Abstract

Introduction and Purpose: As the global population ages, ensuring a good quality of life for older adults becomes increasingly crucial. Tai Chi is a mind-body practice originating from ancient China that combines elements of martial arts, meditation, and focused visualization. In recent years, it has gained increasing popularity in the West, particularly due to its numerous health benefits. The purpose of this article is to review the health benefits of Tai Chi for the elderly population.

Materials and Methods: A literature search was conducted using the medical databases PubMed and Google Scholar. Articles were retrieved in English, employing the keywords: „Tai Chi", „elderly", „ postural balance", „ rehabilitation", „cognition".

State of Knowledge: Tai Chi is a safe form of exercise for older adults. This practice involves slow, harmonious body movements synchronized with deep breathing and concentration. A growing body of research supports the benefits of Tai Chi as an integrative strategy in the treatment and rehabilitation of various age-related conditions. The therapeutic effects of Tai Chi for the health of seniors include improvements in balance, bone health, sleep quality, immunity, cognitive function, metabolic indicators, and cardiorespiratory fitness, as well as the alleviation of pain, symptoms of depression, stress, and anxiety.

Summary: Tai Chi may support healthy aging by improving balance, fitness, and quality of life in older adults, but additional research is needed to fully understand its impact on health.

Keywords: Tai Chi; elderly; postural balance; rehabilitation; cognition

INTRODUCTION AND PURPOSE

Demographic analyses reveal a global trend of population aging, with a rapidly increasing proportion of individuals over the age of 65. In 2015, approximately 8.5% of the global population was classified as elderly, and this percentage is projected to rise to 16.7% by 2050, primarily due to increased life expectancy [1]. The aging process is associated with numerous physiological changes that elevate the risk of chronic diseases and multimorbidity. The progressive decline in cognitive and physical functions with age contributes to an increased vulnerability to disability and frailty [2]. As the global population continues to age, ensuring a high quality of life for older adults becomes increasingly important, making the prevention of disability a critical challenge for public health institutions [3]. Regular physical activity plays a crucial role in promoting healthy aging and is recognized as essential in managing common geriatric syndromes such as sarcopenia and frailty. The benefits of physical activity include improved muscle function, cardiovascular endurance, and overall functional fitness, which help older adults manage chronic conditions. Additionally, it enhances well-being, strengthens social interactions, alleviates loneliness, and supports a good quality of life [4]. A substantial body of research has focused on the use of Tai Chi exercises as a mind-body practice that promotes health in the elderly. The aim of this paper is to review the health benefits of Tai Chi for the elderly population.

MATERIALS AND METHODS

A comprehensive review of the literature was performed by searching through databases such as PubMed and Google Scholar. Articles were retrieved employing the keywords: „ Tai Chi", „elderly", „ postural balance", „ rehabilitation", „cognition". The search included articles published from 2014 to 2024. Frequently cited publications published earlier were also included. Only publications in the English language were considered for inclusion.

TAI CHI

Tai Chi, also known as Tai Ji, Taijiquan, or Tai Chi Chuan, is a mind-body exercise that integrates elements of martial arts, meditation, and visualization, often regarded as a meditative movement practice. Tai Chi involves a sequence of gentle, slow movements coordinated with deep breathing and focused mental attention, with the aim of cultivating Qi (vital energy). Originating in ancient China, Tai Chi was initially practiced as a form of combat but gradually evolved into a widely recognized health intervention. Its philosophical underpinnings are rooted in Taoism, an ancient Chinese doctrine that emphasizes tranquility and longevity [5,6,7,8].

There are five primary styles of Tai Chi: Chen (characterized by large, fast, and powerful movements with deep stances), Wu (featuring medium-paced, compact movements with a higher stance), Sun (smooth, compact movements), and the most popular Yang style (slow, smooth, and continuous movements with a high stance). Traditional Tai Chi styles consist of intricate forms that require considerable time and dedication to master, leading to the creation of simplified versions designed to shorten the learning process and increase accessibility [8]. One such simplified form, Tai Chi Chih (TCC), was specifically developed for the elderly, offering gentle, easy-to-follow movements that can be practiced in a variety of settings [6]. Tai Chi is suitable for individuals of all ages, including seniors with physical limitations or disabilities, and can be practiced individually or in groups, which enhances its social benefits [8,9]. In recent years, Tai Chi has gained popularity in the West due to its potential health benefits, although the physiological mechanisms behind these benefits are not yet fully understood [5,9,10].

THE IMPACT OF TAI CHI ON BALANCE AND MOTOR CONTROL

Falls are the leading cause of injury-related deaths and injuries among individuals over 65, with their frequency increasing with age. Approximately one-third of older adults experience a fall each year, often resulting in serious injuries and heightened fear of subsequent falls. The risk of falls is particularly high during daily activities such as walking, changing posture, or initiating gait (GI). Regular physical activity and avoiding a sedentary lifestyle are crucial for fall prevention in seniors. Tai Chi offers several benefits, including increased lower limb strength, improved flexibility, and enhanced balance. Although the gait in Tai Chi is less stable than traditional walking, it stimulates the postural system to develop adaptive neuromuscular mechanisms, improving stability. Long-term practice strengthens hip and knee muscles, enhancing lateral stability and reducing fall risk [11,12,13,14,15]. Research consistently shows that Tai Chi is effective in reducing fall risk and improving mobility in older adults. For example, a study by Chen et al. found that older women who practiced Tai Chi regularly had better dynamic stability during GI, along with longer and faster steps compared to sedentary women [14]. In another study, postmenopausal women who completed a 12-week Tai Chi program showed significant improvements in balance, flexibility, and muscle strength (all $p<0.05$) [16]. A 16-week Tai Chi program also led to significant improvements in knee extension strength, functional strength, mobility, balance, and reduced fear of falling, with notable gains in the timed up and go (TUG) test ($p=0.003$) and knee extension strength ($p=0.042$) compared to the control group [17]. A meta-analysis by Chen et al. confirmed that Tai Chi effectively reduces fall risk and incidence while

improving balance and mobility, with greater benefits observed with increased frequency and duration of practice [18]. Further studies indicate that Tai Chi not only enhances physical function but also reduces fear of falling and symptoms of depression in seniors at risk of frailty [19]. Another meta-analysis found that regular Tai Chi practice significantly improves physical performance, particularly in individuals with sarcopenia and frailty, as demonstrated by improvements in the 30-second chair stand test and the TUG test [20]. Tai Chi also positively impacts balance and reduces the risk of falls in patients post-stroke and those with Parkinson's disease (PD). After a 12-week Tai Chi Chuan intervention, patients with early-stage PD showed significant improvement in motor symptoms, reflected in lower scores on the Unified Parkinson's Disease Rating Scale Part III (UPDRS-III) [21]. Additionally, it has been demonstrated that a 12-week body weight support Tai Chi (BWS-TC) program improved dynamic balance control and sensory integration in post-stroke individuals, while also enhancing dynamic postural control and reducing the number of falls in individuals with PD over a 6-month follow-up period [22,23,24]. A meta-analysis by Zheng et al. confirmed that practicing Tai Chi 1-2 times per week for at least 30-60 minutes can be an effective form of rehabilitation for stroke patients [25]. Research also highlights the benefits of Tai Chi exercises for patients with multiple sclerosis (MS), particularly in improving balance and coordination [26,27].

In summary, Tai Chi can significantly enhance the quality of life for older adults by reducing the risk of falls. Integrating Tai Chi into therapeutic programs for seniors, stroke patients, and those with PD and MS may serve as a valuable component of healthcare.

THE IMPACT OF TAI CHI ON BONE HEALTH

Osteoporosis is a condition characterized by reduced bone mass and deterioration of bone microstructure, leading to increased fragility and a higher risk of fractures, particularly in older adults. Osteopenia, a state of reduced bone density, serves as a precursor to osteoporosis. Postmenopausal women are particularly susceptible to osteoporosis due to the decline in estrogen levels, which reduces bone mineral density (BMD). Given the side effects associated with pharmacotherapy for osteoporosis, there is growing interest in complementary methods, such as physiotherapy and physical activity. Research suggests that exercise can influence the secretion of hormones affecting bone health, including parathyroid hormone, prostaglandin E2, and estrogen [28,29,30]. Tai Chi exercises in postmenopausal women with osteopenia have been shown to increase biomarkers of bone formation and improve muscle strength, effectively supporting both bone health and overall muscle strength in these patients [31]. In one study, practicing Tai Chi for 48 weeks improved BMD in the lumbar spine (L2-L4)

and femoral neck in healthy older women, although it did not affect the BMD of the greater trochanter and Ward's triangle [32]. A meta-analysis by Zhang et al. assessed the impact of Tai Chi on bone health and fall prevention in postmenopausal women, finding a significant increase in spinal bone density and overall health improvement in women who practiced Tai Chi [33]. Li et al. conducted a critical evaluation of 18 systematic reviews, including 15 meta-analyses, regarding the effects of Tai Chi on bone health. Their findings suggest that perimenopausal and postmenopausal women who practice Tai Chi may experience improvements in BMD in the lumbar spine and femoral neck, but not in the greater trochanter or Ward's triangle. In older adults, potential improvements were observed in BMD of the femoral neck, greater trochanter, and Ward's triangle, though not in the spine [34]. In conclusion, Tai Chi may have a beneficial impact on BMD in postmenopausal women and older adults, although the certainty of this evidence is limited and warrants further research.

THE IMPACT OF TAI CHI ON OSTEOARTHRITIS

Osteoarthritis (OA) affects approximately 7% of the global population, leading to chronic pain, limited mobility, and reduced quality of life, especially among older adults. The knee joint is most commonly affected by OA, and exercise programs like Tai Chi are increasingly being used to alleviate symptoms and maintain physical activity [35]. Research has shown that Tai Chi can effectively reduce pain and improve quality of life in individuals with knee osteoarthritis (KOA). One of the primary mechanisms by which Tai Chi exerts its benefits is through optimizing biomechanical forces in the knee joint, reducing abnormal loading, a key factor in the progression of KOA [36,37].

In a study by Lee et al., both Tai Chi and physical therapy were found to alleviate pain and improve knee joint function in patients with KOA, with effective results observed within 2-5 weeks [38]. Additionally, Tai Chi programs significantly reduced pain (VAS, Visual Analogue Scale: 5 cm before training, 1 cm after; $p<0.001$), improved proprioception, and lowered levels of pro-inflammatory oxylipins in women with KOA, suggesting that Tai Chi may modulate neuroinflammation and pain through lipid pathways and neuronal activity [36,39,40].

The evaluation of Tai Chi's effectiveness in treating KOA has provided moderate evidence of short-term improvements in pain, physical function, and joint stiffness, and strong evidence of enhanced quality of life. However, there is limited evidence regarding long-term effects, highlighting the need for further research on the use of Tai Chi as a complementary therapy for KOA patients [41].

THE IMPACT OF TAI CHI ON PAIN MANAGEMENT

Chronic nonspecific low back pain (CNS-LBP) is a common issue in the aging population and the second most frequent cause of medical visits among individuals over 65. Non-pharmacological treatments for CNS-LBP include manual therapy, acupuncture, cognitive-behavioral therapy (CBT), massage, and exercise, with movement therapy being the preferred method. Evidence suggests that Tai Chi effectively alleviates pain symptoms in older adults with various conditions [42,43,44].

After 12 weeks of Tai Chi Chen training, individuals aged 50 and older with CNS-LBP showed a significant reduction in pain intensity, as measured by the VAS, compared to the control group ($p<0.01$) [43]. A systematic review also indicated that Tai Chi may be more effective in alleviating chronic low back pain than other forms of exercise, including conventional programs and physical therapies [45]. Furthermore, one study suggests that Tai Chi may reduce chronic musculoskeletal pain in older adults by lowering plasma β-endorphin levels, potentially due to Tai Chi's cognitive influence on the regulation of the endogenous opioid pain relief system [46].

The results suggest that Tai Chi is an effective method for treating chronic nonspecific neck pain, comparable to conventional exercises. After 12 weeks of training, participants practicing Tai Chi reported significant pain reduction, improved function, enhanced quality of life, and decreased pain during movement [47]. Additionally, Tai Chi has been proven effective in alleviating headaches and can be used as a preventive measure for migraines. In one study, a 15-week Tai Chi program reduced headache intensity and fatigue in patients with tension-type headaches [48]. Furthermore, a 12-week Tai Chi training program significantly reduced the frequency of migraine attacks and decreased the intensity and duration of headaches in women suffering from migraines [49].

Fibromyalgia is a syndrome characterized by chronic, widespread musculoskeletal pain, often accompanied by sleep disturbances, mood disorders, and fatigue. It affects approximately 1.8% of the population, and treatment primarily focuses on symptom management, with pharmacotherapy often yielding limited results [50]. Wang et al. compared Tai Chi with aerobic exercise in a group of 226 patients with fibromyalgia. After 24 weeks, Tai Chi resulted in greater improvements in FIQR (The Revised Fibromyalgia Impact Questionnaire) scores, overall health status, anxiety levels, and coping strategies compared to aerobic exercise [51].

In summary, Tai Chi may be an effective method for treating chronic pain, including lower back pain, neck pain, migraines, and fibromyalgia, offering improvements in quality of life, particularly for older adults, and it may also be more effective than other forms of exercise.

THE IMPACT OF TAI CHI ON COGNITIVE FUNCTION

The progressive decline in cognitive function associated with aging increases the risk of developing dementia. It is estimated that 5-10% of individuals with mild cognitive impairment (MCI) will develop dementia each year, underscoring the need for effective strategies to prevent or delay this process, especially given the lack of disease-modifying drugs [52].

A study by Sungkarat et al. demonstrated that a 6-month Tai Chi program significantly improved memory, executive functions, and increased plasma levels of brain-derived neurotrophic factor (BDNF) ($p<0.05$) in older adults with amnestic MCI [53]. Another study showed that Tai Chi promoted the release of LRP1 protein via exosomes, which was associated with improved memory, hippocampal plasticity, increased hippocampal volume, and enhanced brain functional connectivity, alleviating cognitive impairment in individuals with MCI [54]. In a randomized clinical trial comparing a 24-week Tai Chi training program with active walking in older adults with type 2 diabetes (T2D) and MCI, it was found that after 36 weeks, participants in the Tai Chi group achieved significantly better results in global cognitive function, as measured by the Montreal Cognitive Assessment (MoCA), than the fitness walking group [55]. A literature review by Chen et al. confirmed that Tai Chi significantly improves executive functions ($p<0.001$), episodic memory ($p=0.001$), visuospatial functions ($p<0.001$), and global cognitive function ($p=0.01$) in older adults with MCI, particularly with long-term practice [56]. Other studies support the comparable effectiveness of Tai Chi and conventional exercises in improving cognitive function in seniors as assessed by the MoCA scale, with Tai Chi showing greater effectiveness in cognitive improvements measured by the Mini-Mental State Examination (MMSE) scale [57]. These findings highlight the significant potential of Tai Chi in enhancing and protecting cognitive functions in the elderly population.

THE IMPACT OF TAI CHI ON ANXIETY AND STRESS

The practice of Tai Chi requires focused attention while maintaining a relaxed mind, which can induce protective inhibition in certain areas of the cerebral cortex, allowing for effective mental rest. In old age, the fear of death becomes more common, often stemming from reduced self-confidence, limited mobility, and loss of independence. The awareness of the inevitability of death can deepen this fear, potentially leading to health problems. One study

observed that regular 12-week Tai Chi practice significantly reduced death anxiety ($p<0.01$) in a group of older women [58,59].

Results from a meta-analysis indicate that mind-body exercises, such as Tai Chi, have a beneficial impact on the mental and physical health of peri- and postmenopausal women, particularly by significantly reducing anxiety, improving sleep quality, alleviating symptoms of depression, and lowering fatigue levels. These findings suggest that Tai Chi may be an effective alternative to hormone therapy in alleviating menopausal symptoms [60]. In one study, the effects of a 12-week Tai Chi intervention on stress and the activation of the inflammatory factor NF-κB (nuclear factor kappa-light-chain-enhancer of activated B cells) were evaluated in individuals over 60 years old experiencing loneliness. The Tai Chi group showed a significant reduction in stress levels and stability in NF-κB levels, while in the control group, stress levels remained high, and NF-κB activation increased [61]. Tai Chi is also recommended as an effective method for managing anxiety in cancer patients [62]. Studies have shown that in patients with advanced lung cancer, Tai Chi significantly improved cognitive functions, with anxiety reduction playing a key role, especially in the early stages of the intervention [63]. In patients with cardiovascular diseases, Tai Chi practice contributed to significant improvements in quality of life, mental and physical health, and reductions in depression and psychological stress compared to control groups [64]. There is also evidence of stress reduction in healthy populations practicing Tai Chi. One study showed that Tai Chi lowers stress levels in healthy, stressed individuals and serves as a safer and less physically demanding alternative to other forms of exercise [65]. Long-term regular Tai Chi practice has also been shown to reduce anxiety and improve cognitive functions in patients with MS [26].

Given these findings, Tai Chi may help reduce anxiety and stress, particularly in older adults and patients with chronic illnesses, making it an effective method for supporting both mental and physical health.

THE IMPACT OF TAI CHI ON INSOMNIA AND DEPRESSION

Insomnia and depression are common mental health disorders that frequently co-occur in older adults. It is estimated that depression affects about 7% of older individuals, while insomnia occurs in nearly 20-40% of them, with depression being the most common cause of chronic insomnia. Research suggests that Tai Chi may help alleviate symptoms of both insomnia and depression [65,66].

Siu et al. compared the effectiveness of a 12-week Tai Chi program with conventional exercise in improving sleep quality in 320 older adults with insomnia. Both methods

significantly improved sleep efficiency, reduced wake time after sleep onset, and decreased the number of awakenings, with effects persisting for 24 months. Tai Chi was found to be as effective as conventional exercise, suggesting it could be a viable alternative in treating insomnia [66]. A study by Irwin et al. compared a three-month Tai Chi program with CBT for treating insomnia in breast cancer survivors. After 15 months, significant improvement in insomnia symptoms was observed in 43.7% of CBT participants and 46.7% of TCC participants, indicating that TCC is as effective as CBT. Both therapies significantly improved sleep quality and reduced symptoms such as fatigue and depression. Although the mechanisms behind TCC's effects are not fully understood, it is believed to reduce sympathetic nervous system arousal and inflammation, thereby improving sleep [67]. Chang et al. investigated the impact of a 24-week Tai Chi program on depression and sleep quality in 124 older women. The results demonstrated that Tai Chi significantly increased levels of 5-hydroxytryptamine and decreased levels of interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-α) ($p<0.05$), leading to improved mood and sleep quality, particularly in the group with the longest sessions. After 24 weeks, this group showed a significant reduction in depression and improvement in sleep compared to the control group ($p<0.05$) [68]. Notably, depression is one of the most common mental disorders in perimenopausal women, and alterations in kynurenine metabolism have been linked to its development. A study found that Tai Chi practice can significantly improve depressive symptoms in perimenopausal women, potentially by regulating abnormal kynurenine metabolism [69]. Research also indicates that Tai Chi significantly enhances sleep quality in patients with advanced lung cancer, outperforming both aerobic exercise and control groups. Participants who practiced Tai Chi experienced greater improvements in subjective sleep quality, better relief from psychological stress, improved physical function, and stabilization of circadian rhythms. Additionally, Tai Chi was associated with significantly higher survival rates compared to the control group [70].

These studies suggest that Tai Chi can effectively alleviate symptoms of insomnia and depression in older adults, offering benefits comparable to those of conventional exercise and CBT.

THE IMPACT OF TAI CHI ON CARDIORESPIRATORY FITNESS

Tai Chi can also serve as a form of cardiopulmonary rehabilitation. Cardiorespiratory fitness (CRF) reflects the ability of the cardiovascular and respiratory systems to efficiently deliver oxygen during prolonged physical activity. With aging and the development of chronic diseases, there is a gradual decline in CRF, which is associated with increased overall

mortality. Low CRF levels are positively correlated with a higher risk of stroke, atherosclerosis, type 2 diabetes (T2DM), and cerebrovascular disorders. A meta-analysis conducted by Tan et al., involving 2,155 participants from 24 studies, demonstrated that regular Tai Chi practice improves VO2 max (maximum oxygen uptake), oxygen pulse, vital capacity (VC), and heart rate (HR), confirming the beneficial effects of Tai Chi on CRF in older adults [71].

A study by Sun et al., involving 60 participants, evaluated the impact of regular Tai Chi practice over a two- and six-year observation period. The Tai Chi group showed a significant reduction in blood pressure ($p<0.001$) and notable decreases in waist circumference, hip circumference, body weight, and BMI ($p<0.001$). Cardiopulmonary function parameters also improved, including cardiac index ($p<0.05$), VC, and VO2 max, and the incidence of complications, mortality, and cardiovascular and cerebrovascular diseases was significantly lower ($p<0.001$) [72].

Additionally, as aging progresses, there is an increase in tonic activity of the sympathetic nervous system (SNS), which is associated with the development of various cardiovascular and metabolic diseases, such as heart failure, atherosclerosis, hypertension, and diabetes. One study documented a significant decrease in SNS activity following TCC practice ($p=0.01$), suggesting its potential in preventing the development of cardiovascular diseases [73]. Studies also suggest that Tai Chi may be a promising therapeutic intervention for patients with COPD (Chronic obstructive pulmonary disease). A meta-analysis by Wu et al., involving 824 patients with COPD, found that Tai Chi significantly improves physical fitness and quality of life compared to no exercise and standard training programs. Patients practicing Tai Chi achieved better results in the 6-minute walk test, reduced scores on the St. George's Respiratory Questionnaire (SGRQ), and improved scores on the Chronic Respiratory Disease Questionnaire (CRQ), indicating that Tai Chi may be an effective alternative in respiratory rehabilitation [74].

Additionally, Tai Chi may be an effective exercise for improving glucose and lipid metabolism in patients with T2DM. A meta-analysis by Xinzheng et al. demonstrated that regular Tai Chi practice significantly lowers fasting blood glucose (FBG), glycated hemoglobin (HbA1c), and triglycerides (TG), while increasing HDL-C cholesterol levels, suggesting that Tai Chi could be considered as part of a prevention and treatment program for T2DM [75].

These studies suggest that Tai Chi may improve cardiorespiratory fitness and metabolic indicators, highlighting its potential role in the prevention and treatment of cardiovascular

diseases, pulmonary conditions, and T2DM.

THE IMPACT OF TAI CHI ON THE IMMUNE SYSTEM AND INFLAMMATION

Inflammation plays a crucial role in the health of older adults, with elevated levels of inflammatory markers such as IL-6 and TNF-α increasing the risk of cardiovascular, neurodegenerative, and cancerous diseases. Despite the strong association between inflammation and aging, effective therapies to reduce inflammation in older adults remain a challenge. Research suggests that physical activity, including Tai Chi, can effectively reduce inflammation in this population [76,77].

Irwin et al. demonstrated that TCC significantly lowers IL-6 levels in healthy seniors with elevated levels of this inflammatory marker [77]. In another study, regular Tai Chi practice over 12 weeks significantly reduced IL-6 and TNF-α levels in older women, with greater reductions observed during longer sessions [68].

Among breast cancer survivors with insomnia, Tai Chi significantly reduced inflammation at both the cellular and systemic levels, surpassing the effects of CBT in lowering IL-6 levels and inflammatory gene expression [78]. Additionally, a 16-week Tai Chi intervention in patients after lung cancer surgery showed a beneficial impact on immune balance and cortisol levels, in contrast to the control group [79]. An assessment of a 16-week Tai Chi program on cell-mediated immunity (CMI) against the varicella-zoster virus (VZV) found that participants achieved higher CMI levels than the control group, with nearly double the increase in immunity ($p<0.001$). Tai Chi also significantly improved immunity, physical functioning, vitality, and mental health ($p<0.05$) [80].

In summary, studies suggest that Tai Chi may be a valuable behavioral intervention for older adults at risk of inflammation-related diseases. It shows potential in improving immune balance, supporting cancer immunity, and enhancing overall health and immunity in the elderly.

THE IMPACT OF TAI CHI ON THE QUALITY OF LIFE OF CANCER PATIENTS

Cancer-related fatigue (CRF) is one of the most common and debilitating side effects of cancer diagnosis and treatment, characterized by persistent physical and mental exhaustion that does not improve with rest [81]. In one study, lung cancer patients undergoing chemotherapy who practiced Tai Chi for 12 weeks experienced a significant reduction in overall and physical fatigue, as well as an increase in vitality compared to the control group, although changes in emotional and mental fatigue were less pronounced [82]. Additionally, a 12-week Tai Chi practice significantly reduced fatigue in women after breast cancer, both immediately post-intervention ($p=0.005$) and at a 3-month follow-up ($p=0.024$) [83]. Campo

et al. assessed the acceptability and feasibility of a 12-week Tai Chi intervention compared to health education in older women who had survived breast cancer. The results indicated that Tai Chi was well-received by participants, as evidenced by high attendance, satisfaction, and willingness to continue after the study. Although no significant differences in overall quality of life were found between the groups, within-group analysis showed significant improvements in mental health in the Tai Chi group [6]. Mustian et al. found that Tai Chi significantly improved aerobic capacity, muscle strength, flexibility, and quality of life in women after breast cancer treatment, regardless of age (33-78 years). Improvements were evident as early as 6 weeks, and adherence rates were very high, supporting participants' return to optimal quality of life [84]. Takemura et al. compared Tai Chi and aerobic exercises in 226 patients with advanced lung cancer, demonstrating that Tai Chi more effectively alleviated overall dyspnea after 16 weeks ($p=0.03$) and one year ($p=0.01$), as well as cancer-specific dyspnea ($p<0.001$), while aerobic exercise was effective only in reducing cancer-specific dyspnea after one year ($p=0.01$) [85]. Considering the results of these studies, Tai Chi shows benefits in alleviating symptoms and improving the quality of life of cancer patients, both during and after treatment. Due to its multifaceted nature, Tai Chi can be an effective non-pharmacological intervention supporting the overall health of patients with cancer.

SUMMARY

Research findings suggest that Tai Chi may be an effective intervention for supporting healthy aging, particularly through improvements in balance, cardiorespiratory fitness, and quality of life in older adults. This practice has proven to be an efficient tool in preventing and alleviating common age-related conditions such as pain, depression, insomnia, and anxiety. Although current studies confirm numerous health benefits of Tai Chi, further research is needed to better understand the mechanisms of action and the long-term impact of this practice on health. It is especially important to explore the extent to which Tai Chi can be integrated with conventional treatment methods to support the health of older adults.

Disclosure

Authors'contribution:

Conceptualization: JS, NS, MKS, KS, SS; Methodology: JS, NS; Software: SS, KS; Check: NS, MKS; Formal Analysis: JS, SS; Investigation: KS, NS, MKS; Resources: KS, SS; Data Curation: JS, NS; Writing-Rough Preparation: MKS, NS, JS; Writing-Review and Editing: JS, NS, MKS, KS, SS; Visualization: NS, SS, KS; Supervision: JS, KS, SS; Project Administration: MKS, JS

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