

Research Progress of Traditional Chinese Exercise Therapy in Musculoskeletal Rehabilitation

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Abstract: With the integration of modern medicine and Chinese traditional medicine, traditional Chinese exercise therapies, such as Baduanjin and Tai Chi, are increasingly being considered in the field of rehabilitation medicine. The aim of this paper is to figure out the application and research progress of those traditional exercises in the rehabilitation of musculoskeletal system disorders. It gives a short review of the traditional practices, summarizes the effectiveness of the restoration of motor dysfunction and the quality of life, and supplies the references for the clinical rehabilitation treatment. Moreover, it presents evidence for evidence-based medicine, benefiting the patients.

Keywords: Modern medicine; Traditional Chinese medicine; Rehabilitation therapy; Musculoskeletal rehabilitation

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1. Introduction

With the rising prevalence of sedentary lifestyles and population aging, the incidence of musculoskeletal disorders—such as osteoarthritis and cervical spondylosis—has continued to increase, severely affecting patients' quality of life. Meanwhile, modern rehabilitation therapies still have certain limitations in terms of long-term efficacy and safety^[1,12]. Traditional Chinese exercise therapies, including Baduanjin, Tai Chi, and Yijinjing, which integrate body regulation, breath control, and mental focus, aim to unblock meridians and strengthen muscles and bones, and have thus gained growing attention in rehabilitation medicine in recent years^[2,7]. Clinical studies have confirmed their positive effects on improving motor dysfunction and enhancing quality of life^[3,8,14]. This paper aims to systematically review the research progress of Baduanjin, Tai Chi, and Yijinjing in musculoskeletal rehabilitation, summarize the clinical evidence for their application,

and explore their potential mechanisms, so as to provide a reference for clinical rehabilitation practice.

2. Traditional Chinese exercise therapies

2.1. Baduanjin

Baduanjin, a well-known traditional Chinese exercise therapy, uses a sequence of short and explosive movements to fortify the musculoskeletal system, improve the circulation of qi and blood, and regulate the vital functions of the internal organs, being an important method for the prevention and treatment of disease ^[1]. This therapy is not only applied for prevention and health maintenance, but also used as an adjuvant rehabilitative method, especially in musculoskeletal system rehabilitation, and is used broadly in the prevention and treatment of chronic diseases like cervical spondylosis, lumbar disc herniation, and osteoarthritis. Nowadays, research has proved that Baduanjin has obvious therapeutic effects on diseases of the muscle and skeletal system, nerve system, respiratory system, and cardiovascular system. ^[2] In practice, Baduanjin emphasizes the waist as the core, stretching the spine and stimulating the meridians in the lumbar region, to strengthen the bones and tendons and improve flexibility of the joints. For patients with certain diseases, it is beneficial to practice the selected movements specifically for their therapeutic effect, to improve function and stimulate activity.

2.2. Tai Chi

Tai Chi is a traditional Chinese exercise that incorporates the ancient daoyin (guiding and stretching) and tunai (breathing) methods. It is a form of internal and external cultivation and has its roots in the classical principles of “emptiness,” “wholeness,” and “overcoming hardness with softness” ^[3]. Its movements are slow, continuous, simple, smooth, and involve interchanges of dynamic and static states, as well as significant and insubstantial aspects ^[4]. Doing Tai Chi not only improves body awareness of one’s environment and control of body movements—in particular, constant shifting of body weight and footwork—it also provides strength training and balance. As a popular sport and exercise therapy for the prevention and treatment of clinical diseases, Tai Chi has been used in the musculoskeletal field to prevent and treat scapulohumeral periarthritis, lumbar disc herniation, knee osteoarthritis, and osteoporosis. Movements “Brush Knee and Twist Step” and “Repulse Monkey” in Tai Chi can greatly reduce the stress on the medial compartment of the knee joint ^[5,6], but the excessive flexion of the knee may have an adverse effect on the patellofemoral joint. After receiving Tai Chi intervention, the gait parameters, such as step length and gait speed, have been enhanced, and the dynamic regulation of the center of gravity of the body causes the hip and knee adduction moments of the lower limbs to change. By enhancing the participation of hip joints, the hip adduction moment is increased, and the knee adduction moment is correspondingly decreased in a synergistic manner.

2.3. Yijinjing

Yijinjing is full of cultural connotations and fitness value. Through a series of stretching movements, mind-guiding body movements, and smooth, natural breathing, it can achieve the effects of strengthening the body and unblocking the meridians ^[7]. Modern studies have shown that Yijinjing has a good adjunctive therapeutic effect on patients with knee osteoarthritis, and it can improve knee stability and the coordinated muscle activation around the knee joint ^[8]. In addition, Yijinjing has proved to have positive effects on the health of the cervical spine; certain movement patterns may produce good rehabilitative effects in patients

with cervical spondylosis. The practice of Yijinjing not only benefits the improvement of physical function and delays aging in the elderly, but can also promote the physical and mental health of adolescents and help alleviate depression, insomnia, and other psychosomatic diseases^[9]. Its medical value is very high. Current works on Yijinjing only explore the complete routine practice^[10], and studies on a single section or decomposed movements are scarce. More research on single movements should be carried out in the future to explore their mechanism in depth, and a systematic framework to guide clinical targeted exercise^[11] should be established.

3. Application of traditional Chinese exercise therapies in musculoskeletal rehabilitation

3.1. Osteoarthritis

Zheng *et al.*^[12] divided 70 middle-aged and elderly patients with KOA into an intervention group and a control group, with 35 cases each, by a randomized grouping method. After dropouts, 30 cases and 31 cases were left in the intervention group and control group, respectively. The two groups were treated as per routine, and the intervention group was additionally given a 12-week Baduanjin exercise intervention. The results indicated that after 12 weeks, the intervention group had significantly lower VAS, a five-times sit-to-stand test time, and a timed up-and-go time compared with the control; one-leg standing with eyes closed time and fall efficacy scores were significantly greater in the intervention group. Therefore, adjunctive Baduanjin training can effectively alleviate knee pain in middle-aged and elderly KOA patients and improve their balance ability and lower limb muscle strength in a positive way. Cao *et al.*^[13] tested the physical fitness of 32 male social sports instructors (aged 60–69) who practiced Baduanjin and compared them with age-matched non-practitioners of Baduanjin. The results have shown that long-term practice of Baduanjin has a positive impact on physical fitness, muscle strength, balance, and neuromuscular reaction capacity of elderly men. Song *et al.*^[14] also randomly assigned 65 female patients with osteoarthritis into a Tai Chi group ($n = 30$) and a control group ($n = 35$). The Tai Chi group practiced Tai Chi for one hour a day for six months, while the control group received rehabilitation education for two hours a month for six months. The results demonstrated that the Tai Chi group had a great improvement in arthritis pain and knee extensor strength when compared with the control group. Chen *et al.*^[15] recruited 50 KOA patients through community advertisement and randomly divided them into a control ($n = 25$) and Tai Chi push-hands ($n = 25$) group. The control group received home-based unsupervised exercise guidance for KOA, and the push-hands group was trained to do Tai Chi push-hands. The results showed that practicing Tai Chi push-hands had positive effects on knee pain reduction and balance ability improvement in patients with KOA.

3.2. Cervical spondylosis

Zheng *et al.* used convenience sampling, 132 patients with cervical spondylosis were selected and randomly divided equally into the control group and observation group ($n = 66$). The control group was given conventional treatment with traditional Chinese medicine treatments such as acupuncture and tuina for 10 days, and TCM nursing care for cervical spondylosis. In the observation group, patients were additionally asked to perform Baduanjin qigong exercise for about 15 minutes each morning and evening. The results indicated that, compared with the control group, the observation group had significant improvement in anxiety, pain, and ADL after practicing Baduanjin. Tu *et al.* enrolled 72 patients with cervical spondylotic

radiculopathy (CSR) and randomly divided them into a conventional rehabilitation group ($n = 36$) and a modified Baduanjin group ($n = 36$). The conventional group was given infrared therapy, traction, and cervical joint mobilization 3 times/week for 4 weeks, and the modified Baduanjin group was given the same plus Baduanjin training 3 times/week for 12 weeks. Results showed that the modified Baduanjin group had better improvement in clinical symptoms, quality of life, and rehabilitation progress compared with the conventional group, and confirmed that the practice of Baduanjin is effective for CSR. Deng selected 60 patients with cervical spondylosis of the neck type, randomly assigned these patients into an experimental group and a control group with 30 patients each, and used traction and medium-frequency electrotherapy for the control group five times a week for 8 weeks, and used 24-form Tai Chi practice plus the same therapy for the experimental group. The experimental group achieved better results in pain relief, cervical range of motion, neck disability, and functional impairment than the control group. It proved that the practice of Tai Chi is helpful for patients with cervical spondylosis of the neck type.

4. Conclusion

The application and research progress of traditional Chinese exercise therapies in the rehabilitation of musculoskeletal diseases was reviewed comprehensively in this paper, which clearly pointed out the significance of Baduanjin, Tai Chi, and Yijinjing for the promotion of musculoskeletal health and for the recovery from diseases. Through the characteristic movements and breathing exercises, these traditional exercises not only effectively alleviate patients' motor dysfunction and improve the quality of life, but also offer complementary and alternative rehabilitative methods to modern medicine and show the prospect and feasibility of traditional Chinese medicine in present-day rehabilitation treatment.

Disclosure statement

The authors declare no conflict of interest.

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