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Influence and intervention of Tai Chi Training on memory muscle injury in middle and old age

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Abstract: The aim of this study was to investigate the effects of tai chi training on Memory Muscle Damage (MMD) in middle-aged and elderly adults and to evaluate its effectiveness as a rehabilitation intervention. Through a 12-week Tai chi training program, middle-aged and elderly patients with MMD were interfered, and their changes in muscle strength, muscle endurance, muscle pain and cognitive function were observed. The results show that tai chi training can significantly improve the symptoms of muscle memory impairment in middle-aged and elderly patients with MMD, and improve their cognitive function, providing a new idea and method for the rehabilitation of MMD.

Keywords: Tai Chi Training; Middle and Old Age, Memory Muscle Injury, Muscle Strength, Muscle Endurance, Muscle Pain, Cognitive Function

Introduction

Research Background

Challenges of an aging society

Demographic change

With declining fertility rates and longer life expectancy, the proportion of elderly people has increased significantly, leading to profound changes in the demographic structure of society. This change has a profound impact on social economy, culture, medical and other fields.

Increasing Economic Pressure

An aging society means more elderly people need social security and medical services, which increases the financial burden on the government. At the same time, a shrinking labor market could also affect the economy's growth potential.

Increased Demand for Health Care

The elderly have a much higher demand for medical security than other age groups, including chronic disease management, rehabilitation services, long-term care and so on. This puts forward higher requirements for the allocation and utilization of medical resources.

Cognitive and physical decline

With age, older people may experience cognitive decline, memory loss and other problems, which not only affects their quality of life, but also may increase social care costs. At the same time, the decline of physical function may also lead to an increased risk of falls and fractures.

Social Adaptability Challenge

Older people may face psychological problems such as social disconnection and increased loneliness, which requires society to provide more diverse services and support to help them stay socially engaged and mentally healthy.

To address these challenges, all sectors of society need to work together, including measures to strengthen the social security system, promote the reform of medical and health services, and promote the employment and participation of the elderly in social activities. At the same time, promoting physical and mental exercise methods suitable for the elderly, such as Tai Chi, is also one of the effective ways to improve the quality of life of the elderly and delay the decline of cognitive and physical functions.

Definition and harm of memory muscle injury

Definitions

The definition of memory muscle injury refers to the "memory" effect of muscles on specific actions after repeated practice or specific action patterns, due to the strengthening of synaptic connections in the nervous system. However, when this memory is associated with wrong movement patterns or overuse, it can lead to muscle damage, and this damage caused by muscle memory is called memory muscle damage.

Hazards

Decreased Muscle Strength and Endurance

Memory muscle injury may cause damage to muscle fibers, which in turn affects the normal contractile function of the muscles, resulting in a significant decline in muscle strength and endurance.

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Pain and Discomfort

The injury site may appear pain, swelling and other discomfort, seriously affecting the patient's daily life and work.

Limited Motor Function

Memory muscle injury can lead to decreased joint stability, affect the patient's motor function, and even cause movement disorders.

Increased Risk of Falls

For older adults, memory muscle damage may increase the risk of falls, which can lead to serious consequences such as fractures.

Psychological Impact

Long-term pain and discomfort may lead to psychological problems such as anxiety and depression, further affecting quality of life.

In order to prevent and treat memory muscle injury, the following measures should be taken:

Correct Practice

When performing any sport or exercise, you should ensure that the movements are correct and moderate to avoid muscle damage caused by overuse or wrong movements.

Moderate rest

During the exercise process, it is necessary to arrange rest time reasonably to avoid overexertion of muscles.

Hot Compress and Massage

When muscle pain or discomfort occurs, it can be relieved by hot compress or massage.

Limitations of existing rehabilitation methods

Mainly Reflected in the Following Aspects

There is no cure for certain diseases

Localized dystonia: This is a chronic, progressive disease that currently has no complete cure. Although there are a variety of treatments such as oral drugs, botulinum toxin injections, and surgical adjuvant therapy, these methods can only achieve a state of improvement, but not completely eliminate the condition.

Contraindications and limitations exist: Certain rehabilitation methods, such as soft tissue extension techniques and muscle strength training techniques, are contraindicated for certain patient groups. For example, patients with inflammation in or around the joint, recent fractures, and severe osteoporosis are not suitable for certain physical rehabilitation treatments.

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The Effects Vary from Person to Person: The results of rehabilitation often vary from individual to individual. Even with the same disease, the recovery process and results can be very different for different patients. This may be related to a variety of factors such as the patient's age, physical condition, severity of the disease, and degree of cooperation.

Long-term Treatment and Ongoing Attention are Required: Many healing processes require long-term treatment and constant attention. For example, hemiplegia rehabilitation not only needs to enhance muscle strength, but also restore nerve function and improve motor coordination, which requires systematic rehabilitation training, combined with physical therapy, speech therapy, occupational therapy and other means to gradually improve the dysfunction.

Influence of Psychological and Social Factors: During the recovery process, patients may face psychological and social challenges. For example, long-term pain and discomfort may lead to psychological problems such as anxiety and depression, further affecting the recovery effect. At the same time, the lack of social support system may also affect the recovery process of patients.

Research purpose and significance

To Explore the Rehabilitation Effect of Tai Chi Training on Memory Muscle Damage (MMD)

Tai Chi training, as a kind of low-intensity and high-adaptability aerobic exercise, has been widely concerned in the field of rehabilitation in recent years. Although MMD is not a medical term, we can understand it as muscle damage or dysfunction related to memory function. In this context, it is of practical significance to explore the rehabilitation effect of tai chi training on MMD.

Improvement of Cognitive Function by Tai Chi Training

Improve Memory: Tai Chi training has been shown to improve memory in older people. One study showed that after six months of tai chi training, the cognitive assessment scores of older adults improved significantly, equivalent to delaying cognitive decline

Enhance Brain Connectivity: Tai Chi training improves cognitive function by activating areas of the brain associated with cognitive flexibility, decision making, visual processing, memory, and motor control, enhancing the connectivity of various brain regions

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Improvement of Muscle and Balance Ability by Tai Chi Training

Build muscle strength

Tai Chi training can enhance lower limb muscle strength, which is important for improving muscle weakness caused by MMD. For example, a study of teenagers with intellectual disabilities found that 15 weeks of tai chi significantly improved their lower limb muscle strength

Improve Balance

Tai Chi training emphasizes maintaining balance and stability in the body, which is essential for preventing falls and reducing the risk of muscle injury in patients with MMD. Studies have shown that Tai Chi can reduce the risk of falls and improve balance

The Promoting Effect of Tai Chi Training on Overall Rehabilitation

Improve the Quality of Life

By improving cognitive function and muscle strength, tai chi training helps improve the quality of life for people with MMD. This includes reducing the risk of falls and improving the ability to perform daily activities.

Promote Mental Health

Tai Chi training also has a certain psychological adjustment effect, which can alleviate the anxiety, depression and other psychological problems that may exist in MMD patients, so as to further promote the overall rehabilitation.

Providing New Rehabilitation Options for Patients with Memory Muscle Damage (MMD)

Traditional Rehabilitation Therapy

Muscle Stretching and Functional Training: Guided by a physiotherapist, a series of stretches performed during a specific period of time are designed to increase joint range of motion and relieve tension, reduce muscle stiffness, improve blood circulation, and promote damaged tissue repair.

Functional training focuses on muscle strength, coordination, and balance, strengthening the muscles around the injured area, preventing secondary injuries, and speeding up the recovery process.

Alternating Hot and Cold Compress and Massage Therapy: Use cold and hot compress alternately. Cold compress can shrink capillaries, slow down blood flow, reduce local metabolic rate, reduce swelling and pain; Hot compresses dilate blood vessels, increase blood flow, and encourage inflammation to subside. Massage therapy relaxes tight muscles by applying pressure, improves blood circulation, relieves muscle

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tension and pain, and helps speed up injury healing.

Innovative rehabilitation options

Tai Chi Training:

As a traditional Chinese health and fitness method, Tai Chi has been proved to have significant benefits for patients with chronic cognitive impairment, can significantly improve the effect of cognitive training, and may even delay cognitive decline.

For patients with MMD, tai chi training not only improves cognitive function, but also enhances muscle strength and balance, improves quality of life, and promotes mental health.

Cognitive function training:

Specific training for brain function to improve memory, attention, and other cognitive abilities. Especially suitable for patients with short-term memory impairment due to MMD, this type of training is usually guided by a professional rehabilitator or psychologist and conducted in a quiet and comfortable environment to ensure results.

Literature Review

Influence of Tai Chi training on physical health

Build muscle strength

Tai Chi exercises the body through a series of fluid movements and breathing exercises that stimulate muscle contractions that build muscle strength. Proper tai chi practice helps to increase muscle mass and improve body strength and stability.

Improve flexibility

Tai Chi emphasizes the coordination and coherence between various parts of the body, including a variety of stretching, twisting and other movements, long-term persistence can make the joint more flexible, reduce the stiffness caused by age.

Improve balance

Many movements in Tai Chi involve the training of weight shift and lower limb stability, which helps to improve the body's balance ability, and is especially important for the elderly or people at risk of falling, which can reduce the risk of fall injury.

Promote cardiorespiratory function

Although Tai Chi is a gentle exercise, it can effectively improve heart and lung function and improve blood circulation. Regular practice of Tai Chi helps to lower blood

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pressure, improve lipid levels and prevent related diseases.

Enhance memory

Tai Chi Quan can increase memory, long-term practice of Tai Chi Quan people's memory will gradually enhance, in addition, Tai Chi Quan combined with memory training can also significantly improve the memory function of elderly people with memory disorders.

Relax

Tai Chi focuses on breathing regulation and inner peace, helps reduce stress and anxiety, helps people better cope with life's challenges and maintains mental health.

Fall Prevention

Tai Chi can reduce the risk of falls, which is especially important for the elderly. By improving balance and strengthening muscle strength, Tai Chi can significantly reduce the incidence of falls.

Influence of Tai Chi training on cognitive function

Enhance memory

Tai Chi training through the emphasis on "mind calm" and "mind movement", in the process of practice need to focus on concentration, thus imperceptibly improve the brain's thinking function, help to enhance memory.

Prevent cognitive decline

A controlled trial conducted by Fujian University of Traditional Chinese Medicine shows that tai chi can effectively treat mild cognitive impairment in the elderly and significantly delay the decline of cognitive function in the elderly. A multicenter randomized controlled trial also presented scientific evidence supporting the effectiveness of tai chi as a therapy to benefit older adults with mild cognitive impairment.

Improve cognitive training

According to a study published by the Alzheimer's Association, tai chi enhances cognitive training and delays mild cognitive decline. Among the 152 patients with mild cognitive impairment included, the "cognitive + Tai chi training" group improved cognitive and memory abilities faster and to a greater extent.

Improve overall cognitive and executive function

A study published in the Annals of Internal Medicine shows that traditional tai chi is superior to conventional stretching exercises in improving overall cognition and reducing walking disturbances, and can significantly improve overall cognition and executive function in the elderly, and this

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improvement effect can last for a longer time.

Progress of rehabilitation research on Memory Muscle Damage (MMD)

Application of Tai chi training

Delay cognitive decline:

A study by the Ruijin Hospital Neurology team found that for patients with chronic cognitive impairment (MCI), supplemented with tai chi can significantly improve the effect of cognitive training. Cognitive training (120min/ week) + tai chi training (120min/ week) delayed cognitive decline for at least 2 years in patients with MCI.

Brain plasticity improved:

The effect of Tai Chi Quan and ordinary aerobic exercise on brain plasticity research has shown that Tai Chi Quan can improve brain structure, such as gray matter volume, and optimize local functional organization and brain structure changes in the elderly, thereby enhancing brain plasticity.

Other innovative therapies

Repetitive Transcranial Magnetic Stimulation (RTMS) combined with Tai Chi: Studies have shown that repetitive transcranial magnetic stimulation (RTMS) can enhance the effectiveness of tai chi in improving sleep quality and Cognitive function in older adults with sleep disorders and Mild Cognitive Impairment (MCI). This combination therapy showed significant benefits at 6 weeks and maintained these benefits at 12 weeks of follow-up.

Disease-specific research

Parkinson's Disease: Research from Shanghai Jiao Tong University School of Medicine shows that practicing tai chi may suppress the symptoms and complications of Parkinson's disease for several years. Long-term adherence to tai chi training has been associated with benefits in people with Parkinson's disease, including delaying disease progression, reducing the occurrence of complications, and improving quality of life by 45%.

Future research direction

Comprehensive rehabilitation strategy: In the future, MMD rehabilitation research may focus more on the formulation and implementation of comprehensive rehabilitation strategies, combining traditional therapies and innovative methods, such as tai chi training, cognitive function training, neuromodulation technology, etc., to provide patients with a full range of rehabilitation services.

Personalized rehabilitation plan: With the in-depth understanding of the pathological mechanism of MMD, future

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rehabilitation research may pay more attention to the development of personalized rehabilitation plans, and carry out targeted rehabilitation interventions according to the specific conditions of patients.

Research Methods

Research Design

Randomized controlled trial design

Subject recruitment and randomized controlled group trials

Objective

To evaluate the effects of specific intervention of tai chi training on cognitive function, muscle strength, and balance in patients with MMD.

Secondary objective

To explore the potential benefits of the intervention on the quality of life and psychological status of patients with MMD.

Inclusion criteria

Patients diagnosed with MMD, age, gender, disease course and other characteristics met the study requirements.

Exclusion criteria

Patients with severe complications who were unable to complete the intervention or assessment.

Random grouping

Patients meeting inclusion criteria were randomly divided into two groups

Intervention group: Received the specific intervention tai chi training.

Control group: received conventional treatment or placebo.

Intervention measure

Intervention group: Tai Chi training for a certain period of time, including specific movements, frequency, duration and intensity.

Control group: may receive conventional treatment, no treatment, or placebo, depending on the study design.

Evaluation index

Main assessment indicators: cognitive function test, attention, muscle strength assessment, balance ability test, etc.

Secondary assessment indicators: quality of life questionnaire, mental state assessment, anxiety, depression, biomarker detection, etc.

Data collection and analysis

Data collection: Assessment indicator data were collected periodically before, during and after the intervention.

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Data analysis: Statistical software was used to process and analyze the data, compare the differences between the two groups, and evaluate

Effectiveness of intervention

Ethical consideration

Ensure that research complies with ethical principles, obtains patient informed consent, and protects patient privacy and data security.

Subject intervention group: received tai chi training with specific intervention

Age, Gender, Medical History, Tai Chi training and other basic information.

Table 1. Participant Demographics and Tai Chi Training Characteristics

Participant Number	Age	Sex	Medical History (Year)	Tai Chi Training (Week)	Attention (1-10)	Muscle Strength (1-10)	Balance Ability (1-10)	Participation Time (Month)	Anxiety Depression Motor Ability	Anxiety Depression Motor Ability 1-10
001	65	M	3	2 Times a Week	7	6	5	6	Normal	7
002	72	F	4	Once a Week	3	3	3	3	Mild Anxiety	4
003	68	M	5	3 Times a Week	8	7	7	8	Normal	8
004	70	F	3	2 Times a week	5	4	5	5	Major Depression	5
005	75	M	6	Once a Week	4	4	4	5	Moderate Anxiety	4
006	67	F	5	4 Times a Week	9	8	8	10	Moderate Depression	8
007	74	M	6	2 Times a Week	5	5	6	4	Mild Anxiety	6
008	71	F	3	Once a Week	3	3	4	5	Mild Anxiety	4
009	69	M	4	3 Times a Week	8	7	8	9	Normal	8
010	73	F	6	Once a Week	4	4	5	5	Moderate Depression	6

Subjects control group: received conventional treatment or medication Age, Sex, Medical History, Medication and other basic information

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Table 2. Participant Health Profile, Lifestyle Habits, Mental State, and Tai Chi Participation

Participant Number	Age	Sex	Medical History	BMI	Athletic Ability Score (1-10)	Lifestyle Habits	Mental State	Participation Time (Month)	Medication Status	Tai Chi Training
001	60	M	Yes	24.5	4	Medium	Normal	6	Yes	None
002	72	F	Yes	26.0	5	Low	Mild Anxiety	4	Yes	None
003	68	M	Yes	23.0	6	High	Normal	5	Yes	None
004	70	F	Yes	30.0	4	Low	Major Depression	5	Yes	None
005	75	M	Yes	28.5	6	Medium	Normal	6	Yes	None
006	67	F	Yes	22.0	4	High	Normal	7	Yes	None
007	74	M	Yes	29.0	5	Medium	Mild Anxiety	3	Yes	None
008	71	F	Yes	27.5	6	Low	Normal	6	Yes	None
009	69	M	Yes	25.0	5	High	Normal	6	Yes	None
010	73	F	Yes	31.0	4	Low	Moderate Depression	5	Yes	None

Design and implementation of Tai chi training program

Design of Tai Chi training program

Training purpose

Improve the physical fitness of the practitioner, including the flexibility, coordination and strength.

Enhance the practitioner's skills of Tai Chi and master the basic moves and routines of Tai Chi.

Cultivate the practitioner's tai Chi state, so that the body into a good pre-response state, improve the level of physical and mental health.

Training object

For practitioners of different ages and physical levels, including beginners, advanced and masters.

Develop a personalized training plan according to the specific needs and goals of the practitioner.

Training content

Basic skills training: including the basic movements of standing pile, spitting, sitting and so on, to lay the foundation for the learning of Tai Chi Quan.

Move training: Learn all kinds of moves of Tai Chi Quan, such as white crane shining wings, hugging knees, mustang parting hair, etc., and gradually master the routine of Tai Chi Quan.

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Push hand training: Through the push hand practice, improve the practical application of Tai Chi Quan, enhance the body's sensitivity and reaction speed.

Health movement training: Learn the health movement of Tai Chi, such as Tai Chi holding boxing, Tai Chi fan, etc., to promote physical and mental health.

Training time

Make a reasonable training plan according to the time arrangement and training intensity of the practitioner.

For example, training six days a week, training for one hour a day, while scheduling learning time for Tai Chi theoretical knowledge.

Training method

Face-to-face teaching: Tai Chi Quan professionals are invited to conduct face-to-face teaching to guide practitioners to master the basic movements and routines of **Tai Chi Quan.**

Video teaching: Watch Tai Chi teaching videos to help understand the movement essentials of Tai Chi.

Group practice: the practitioners communicate with each other and correct each other to improve the accuracy of the movement.

Actual combat exercise: Organize actual combat exercise, so that practitioners can understand the use of Tai Chi Quan in actual combat.

Implementation of Tai Chi training program

Develop a detailed training plan

According to the design of the training program, make a detailed training plan, including training content, training time and training methods.

Inform practitioners of the training plan and seek their opinions and suggestions to ensure the feasibility and effectiveness of the training plan.

Organize a professional teaching team

Tai Chi Quan coaches with rich experience and professional knowledge are invited to form a teaching team.

The teaching team should have good communication skills and teaching skills, and be able to provide personalized guidance according to the needs of different practitioners.

Setting and intervention of control group

Setting of control group

The control group was set up to provide a group that was similar to the experimental group (tai chi training group) in all aspects

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except tai chi training in order to accurately assess the effects of tai chi training. The control group generally did not take any of the interventions associated with tai chi training, but maintained their old lifestyle or engaged in regular activities. No intervention: Members of the control group did not engage in tai chi training or other specific physical exercise during the study.

Lifestyle maintenance: Control group members continued their daily activities without any additional physical exercise or intervention.

Control group intervention

Activity records: Members of the control group were required to record their daily activities, including static work, low intensity activity, moderate intensity activity and high intensity activity, in order to compare the activity level with that of the tai Chi training group.

Baseline data collection: Before the start of the study, baseline data of the members of the control group, such as physical indicators and psychological status, were collected for reference in subsequent analysis.

Follow-up assessment: Members of the control group were followed up during and after the study to see how their physical and mental states changed.

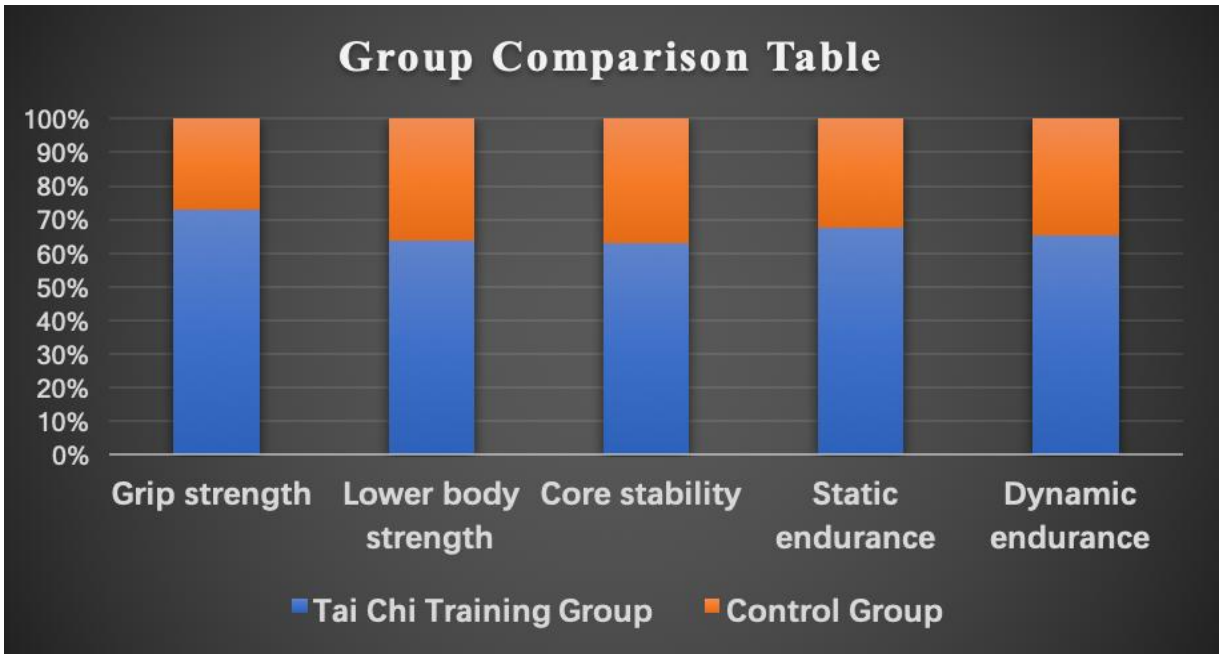

Figure 1. Assessment methods of muscle strength and endurance

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Table 3. Physical Performance Assessment Scores for Tai Chi Training and Control Groups

Group	Age	Sex	Grip strength (up 0-100%)	Lower body strength (up 0-10%)	Core stability (up 0-100%)	Static endurance (up 0-100%)	Dynamic endurance (up 0-100%)
Tai Chi Training Group	58	M	8	9	7	8	7
	60	F	6	8	6	8	6
	67	M	8	10	8	8	7
Control Group	70	F	2	3	2	3	2
	68	M	3	4	3	4	1
	65	F	2	3	2	3	2

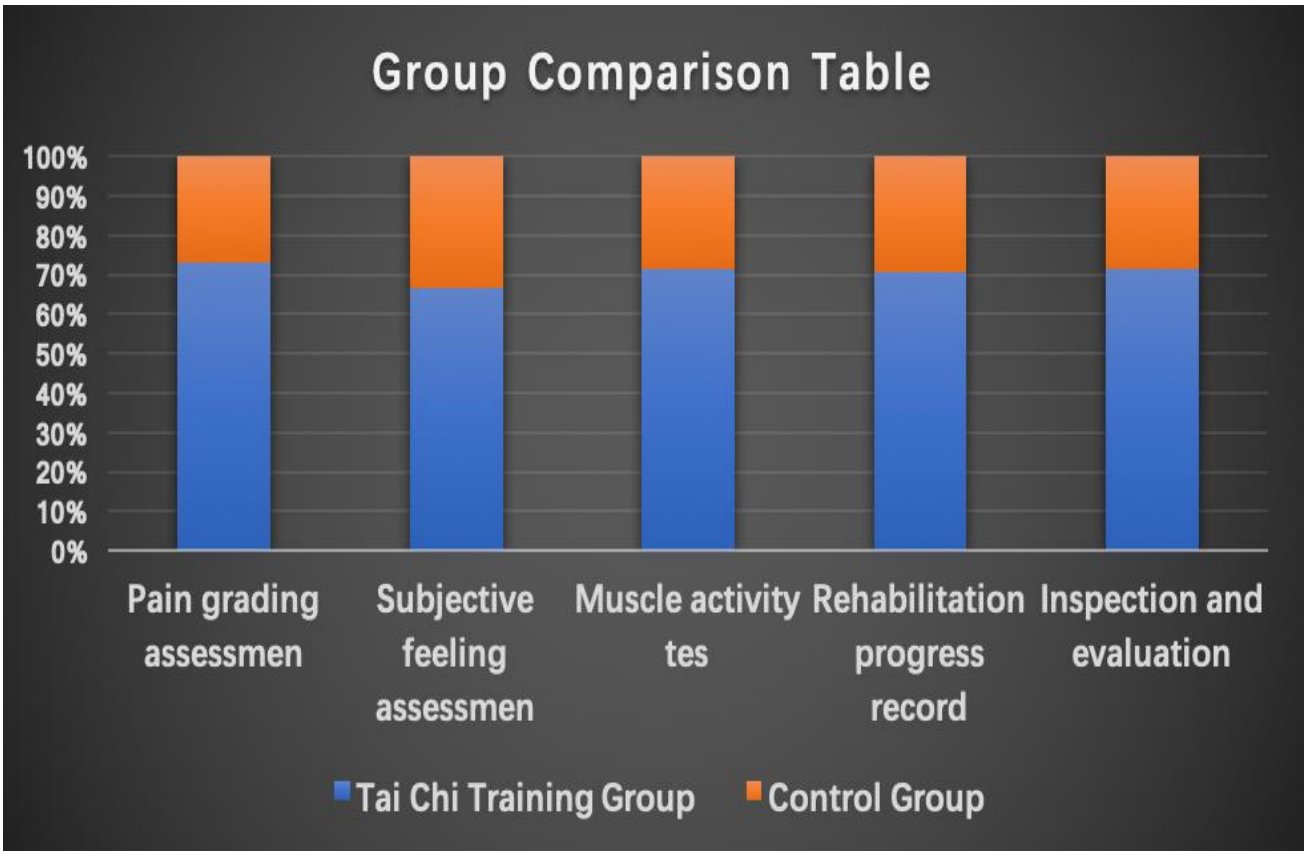

Figure 2. Assessment methods of muscle strength and endurance

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Table 4. Comparison of Pain, Subjective Assessment, Muscle Activity, Rehabilitation Progress, and Evaluation Scores Between Tai Chi Training and Control Groups

Group	Age	Sex	Grip strength (up 0-100%)	Lower body strength (up 0-10%)	Core stability (up 0-100%)	Static endurance (up 0-100%)	Dynamic endurance (up 0-100%)
Tai Chi Training Group	58	M	8	9	7	8	7
	60	F	6	8	6	8	6
	67	M	8	10	8	8	7
Control Group	70	F	2	3	2	3	2
	68	M	3	4	3	4	1
	65	F	2	3	2	3	2

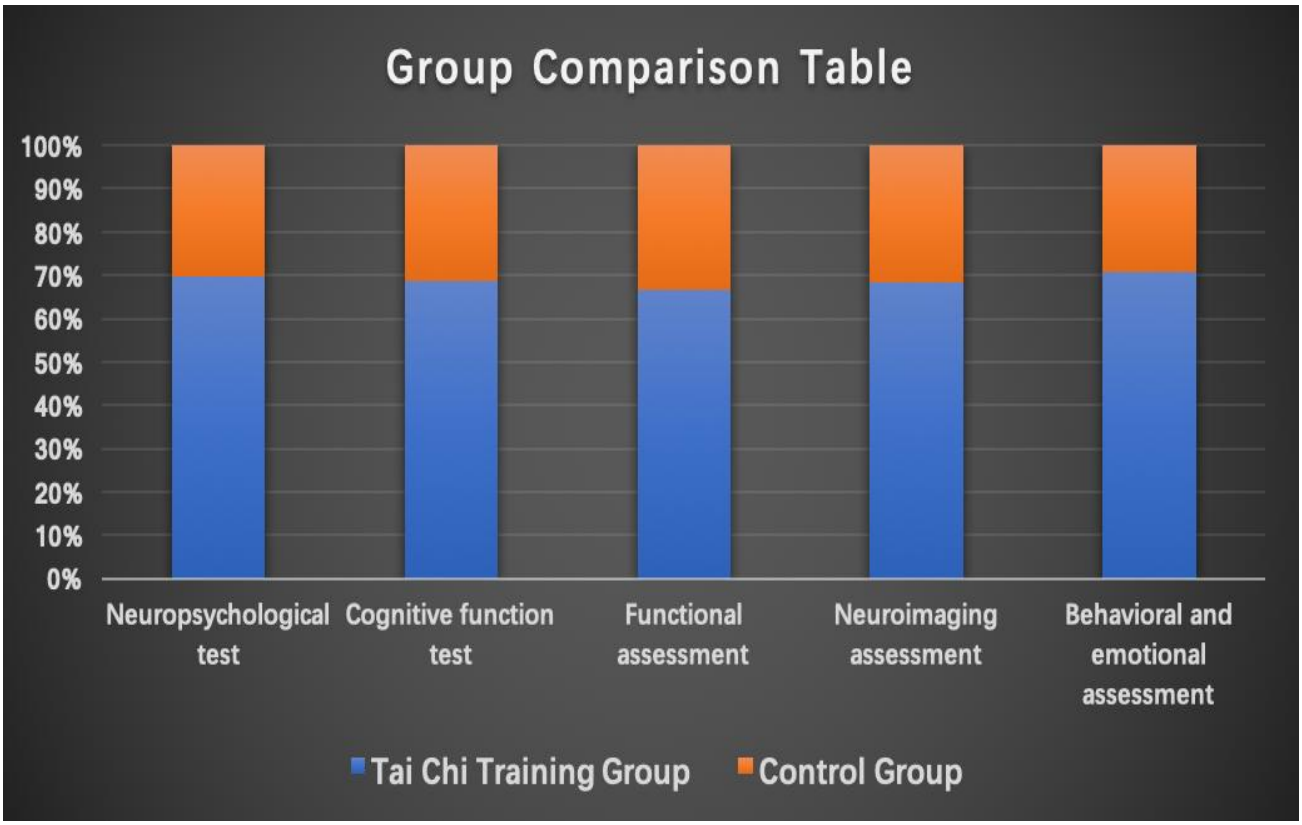

Figure 3. Assessment methods of cognitive function

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Table 5. Comparison of Neuropsychological, Cognitive, Functional, Neuroimaging, and Behavioral Assessments Between Tai Chi Training and Control Groups

Group	Age	Sex	Neuropsychological test (up to 0-100%)	Cognitive function test (up 0-100%)	Functional assessment (up 0-100%)	Neuroimaging assessment (up 0-100%)	Behavioral and emotional assessment (up 0-100%)
Tai Chi Training Group	58	M	55	57	60	58	60
	60	F	54	55	60	57	58
	67	M	53	57	60	59	60
Control Group	70	F	24	26	30	27	25
	68	M	25	26	28	27	26
	65	F	24	25	30	27	25

Data collection and analysis

Data Collection Process

Clarify the survey questions

The objectives and questions of the research need to be clearly defined first, which will guide the entire data collection process.

Identify the respondents

Based on the research question, identify the subjects or groups for which data needs to be collected.

Select the investigation method

According to the research needs, select the appropriate investigation method, such as questionnaire survey, interview, field observation, etc.

Conduct a survey

Collect data on the identified respondents in a selected manner.

Record the result

record the collected data accurately and completely to ensure the authenticity and reliability of the data.

Conclusion

After the data collection is completed, the data is preliminarily organized and analyzed, and the preliminary conclusion is drawn.

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Statistical analysis methods:

Comparative analysis

By comparing the differences between different data to reveal the rule, it is often used to compare the data differences between different groups and different time points.

Cross-analysis

Cross-presentation of data from different dimensions to gain a more comprehensive understanding of the complexity and diversity behind the data.

Logical tree analysis

a complex problem is broken down into several small problems, and then analyzed one by one, suitable for the study of complex cognitive phenomena or decision-making process.

Regression analysis

Through regression analysis, you can study the dependence between variables and predict the change of one variable with another or more variables.

Results

Changes in muscle strength and endurance

Changes of Tai Chi training group

Significant increase in muscle strength

Stroke patients: The study showed that after 12 weeks of sitting tai Chi training, stroke patients showed significant improvements in hand and arm muscle strength, and patients in the Tai Chi group showed a more pronounced advantage in muscle strength recovery compared to patients who received standard stroke rehabilitation training.

Elderly female knee OA patients: After 12 weeks of modified tai chi exercise intervention, RMS (root mean square value) and MF (average frequency) values of lower limb muscle strength (including vastus medialis muscle, femoris rectus muscle, vastus lateralis muscle and biceps femoris muscle) of elderly female knee osteoarthritis patients were significantly increased compared with those before treatment, indicating that tai chi training has a positive impact on lower limb muscle strength.

Muscle endurance improvement

Stroke patients: Tai Chi training also significantly improved the balance control of stroke patients, sitting balance control, etc., and these improvements helped to improve the overall muscle endurance of patients.

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Elderly women with knee OA: Modified tai Chi exercise also improved cardiopulmonary endurance in elderly women with knee osteoarthritis, as shown by significant increases in cardiovascular function, lung function, and walking distance in the 6-minute walk test (6MWT), which indirectly reflected improved muscle endurance.

Changes in the control group

There was no significant change in muscle strength and endurance:

In the study above, the control group (those who received standard stroke rehabilitation training or no exercise-specific intervention) showed no significant changes in muscle strength or endurance.

Change trend before and after intervention

Increased muscle strength:

Early stages: In the early stages of Tai Chi training, individuals may experience muscle soreness because the muscles are adjusting to new patterns of movement. But over time, the muscles adapt and get stronger.

Metaphase: After a period of Tai chi training, the individual can clearly feel the improvement of muscle strength. This improvement is not only reflected in absolute strength, but also in muscular endurance, that is, the preservation of muscles during long periods of activity

Ability to hold power

Long-term: long-term adherence to Tai chi training, the individual's muscle strength will continue to increase, and may even exceed the pre-training level. This enhancement helps improve body stability and athletic performance.

Improved muscle endurance:

Early stage: Similar to the increase in muscle strength, individuals may experience insufficient muscle endurance and fatigue in the early stages of Tai chi training.

Middle stage: With the deepening of training, the individual's muscle endurance will gradually improve. They are able to maintain consistent athletic performance for longer periods of time without becoming fatigued easily.

Long-term: Long-term adherence to Tai chi training can significantly improve an individual's muscular endurance level. This boost helps individuals better cope with various physical activities in their daily lives.

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Changes in muscle pain

Tai Chi Training Group

Early stage

Common muscle pain: Beginners in the beginning of tai chi training, because the body has not yet adapted to the new mode of movement, often appear muscle pain. This is mainly because muscle fibers develop tiny tears and damage as they adapt to a new load, along with a buildup of metabolites such as lactic acid that stimulate nerve endings to produce a sense of pain. Various areas of pain: Pain can include shoulders, arms, lower back and knees, especially those muscle groups that are not normally used.

Mid-term

Gradual reduction of pain: As the training continues, the body gradually adjusts to the rhythm and intensity of Tai Chi, and the phenomenon of muscle pain will gradually reduce. This is because muscle fibers, after experiencing minor initial damage, trigger the process of repair and growth, becoming stronger and more adaptable.

Pain feedback: In the medium term, pain can become an important feedback signal for the trainer to adjust the movement and posture. By carefully listening to the body's feedback, the trainer can gradually find a comfortable way and position that is more suitable for him, thereby avoiding unnecessary injury and pain.

Long-term

Pain disappears: After long-term adherence to tai chi training, the trainer's body will undergo qualitative changes, muscles and bones become more tough and powerful. At this time, in the process of practicing, instead of feeling tired of acid, numbness and distension, there will be a wonderful boxing environment of vigorous true qi and refreshing brain spirit.

Control group (no tai chi training or other types of training)

Muscle pain: If members of the control group did not engage in any form of training, their muscle pain was likely to remain stable or fluctuate with daily activities. If they do other types of training, the pain will depend on the type, intensity, and duration of the training.

Lack of adaptive changes: Compared with the Tai Chi training group, the members of the control group lacked the adaptive changes in the muscles and muscles brought about by tai chi training. As a result, they may be more prone to muscle pain and injury when faced with the same exercise load.

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Changes in cognitive function

Changes of cognitive function in Tai Chi training group

Significant improvement

The Tai Chi training group showed significant improvement in cognitive function, especially in memory, orientation, attention, executive function, etc. Elderly people who performed tai chi exercise for a long time had a significant increase in the thickness of the cerebral cortex, especially in the prefrontal area responsible for memory and cognitive function, which helped to improve individual attention and executive function.

Delay decline

Tai Chi training has been shown to significantly delay cognitive decline in people with mild cognitive impairment and type 2 diabetes, and in older adults with mild cognitive impairment, Tai chi training is able to slow or counteract years of cognitive decline and maintain functions needed to live alone.

Changes of cognitive function in the control group

Relatively stable or gradually declining

The control group (such as those who did stretching exercises or no specific exercise) showed a relatively stable or gradual decline in cognitive function, and older adults who lack physical and mental exercise such as tai chi training may be more susceptible to aging and other factors, leading to decline in cognitive function.

Comparison between tai chi training group and control group

Significant differences

There were significant differences in cognitive function between the tai chi training group and the control group. The tai chi training group showed a clear trend of improvement and delay of decline, while the control group was relatively stable or gradually declining. In one study, people who performed a certain type of tai chi showed a three-fold improvement in cognitive performance compared with the stretching group, and follow-up tests showed continued improvement nearly a year later.

Physiological mechanism

Tai Chi training may have a positive impact on cognitive function by promoting the secretion of nerve growth factors (such as brain-derived neurotrophic factor), improving the connectivity of the brain's white matter, promoting the balance of brain neurotransmitters, and improving brain microstructure.

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Security and compliance

Safety assessment of tai chi training

Systematic evaluation evidence

A systematic review of 210 controlled clinical trials showed that Tai Chi demonstrated good safety and efficacy across a variety of health effects. These studies covered a wide range of health areas, including chronic disease rehabilitation, cognitive improvement, balance and aerobic capacity improvement, and none found that tai chi training caused serious safety problems.

Specific research support

Antihypertensive effect: Studies have shown that Tai Chi Quan exercise has a good antihypertensive effect, and has a high safety. This conclusion is based on a systematic review of 22 Chinese and English literature, including five randomized controlled studies.

Cardiovascular disease prevention: Long-term tai chi can significantly improve the cardiovascular and cerebrovascular risk factors of middle-aged and elderly people, such as blood pressure, weight, waist circumference, and reduce the incidence of chronic diseases. A six-year follow-up study found that the incidence of chronic diseases was significantly lower in the Tai Chi group than in the control group.

Risk prevention measures

Despite the overall safety of tai chi training, there are some precautions that need to be taken to reduce potential risks

Warm-up exercise

Proper warm-up exercise before tai chi training can help prevent accidental injuries such as muscle strains.

Venue selection

Choose a flat, dry field for training, and avoid practicing on slippery or uneven ground to reduce the risk of falling.

Wear the right exercise equipment, such as non-slip shoes and loose, comfortable sportswear, to help improve training effectiveness and safety.

Physical condition monitoring

Pay close attention to your physical condition during training. If discomfort symptoms such as dizziness and chest tightness occur, stop training immediately and seek medical help.

Compliance of subjects

The unique charm of Tai Chi training

Tai Chi training skillfully integrates the knowledge of martial arts, philosophy, medicine and other disciplines, forming a unique teaching system with rich connotations. This scientific and reasonable

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teaching method fully demonstrates the profound heritage and unique charm of Tai Chi Quan culture, so that the subjects can appreciate the essence and mystery of Tai Chi Quan, thus improving their participation enthusiasm and compliance.

Multiple benefits of Tai Chi training

Better mood

During Tai Chi training, the brain releases substances called endorphins, which make people feel happy and help eliminate stress and depression.

Younger

Tai chi exercise can improve the heart and brain function to a certain extent, and can significantly reduce the incidence of **Hyperlipidemia**

Improve the mood, sleep, personality, memory and motor stability of the elderly; Promote cardiopulmonary function and energy metabolism; Balance the meridians, improve the microcirculation of the end of the human body, and have a remarkable anti-aging effect.

More agile thinking

Tai Chi training helps to improve the mental agility of the subjects, enabling them to better cope with various challenges in daily life.

Management of subject compliance

In Tai Chi training intervention trials, subject compliance management is also one of the key factors to ensure high compliance. The researchers improved participants' engagement and adherence through detailed informed consent, health education, regular follow-up, and incentives. In addition, Tai chi training also pays attention to the close combination of practice and understanding, encouraging the subjects to constantly figure out the boxing theory and deeply understand the boxing meaning in repeated practice, which further enhances their compliance and training effect.

Discussion

Influence of Tai Chi training on muscle strength and endurance

Possible physiological mechanism

Effect of tai Chi training on muscle strength and endurance

Build muscle strength: Tai Chi training, while slow in movement, requires sustained muscle control and strength maintenance. Long-term practice can strengthen key muscle groups such as the legs, waist and back, improving stability and support.

Improve muscle endurance: Tai Chi training uses a series of fluid movements

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and breathing exercises to train muscles in sustained activity. This type of exercise helps to build muscle endurance, so that muscles can maintain activity for longer.

Possible physiological mechanism

Adaptive changes in muscle fibers: Long-term Tai chi training may lead to adaptive changes in muscle fibers, such as the transformation of fast muscle fibers to slow muscle fibers, or the proliferation and hypertrophy of slow muscle fibers. These changes help improve muscle endurance and strength.

Optimization of the nervous system: Tai Chi training requires a high degree of concentration and coordination of muscle activity through nervous system regulation. Long-term practice may optimize the function of the nervous system and improve the ability of nerves to innervate muscles, thereby increasing muscle strength and endurance.

Improvement of blood circulation: Tai Chi training promotes blood circulation through slow and rhythmic movements, increasing blood supply and oxygen supply to the muscles. This helps to improve the metabolic environment of muscles and improve muscle endurance and recovery.

Regulation of the endocrine system: The relaxation and meditative state of Tai Chi training helps to regulate hormone levels in the body, such as increasing the release of beneficial hormones such as endorphins. Changes in these hormones may have a positive effect on muscle growth and repair, thereby increasing muscle strength and endurance.

Comparison with other rehabilitation methods

Effect of tai Chi training on muscle strength and endurance

Tai Chi training uses a series of smooth and slow movements, combined with deep breathing and concentration, to effectively exercise muscles throughout the body, especially the lower extremities and core. This type of exercise not only increases the strength of the muscles, but also improves the endurance of the muscles, so that the muscles can maintain a longer state of activity. Long-term adherence to Tai chi training can significantly improve muscle mass, improve body stability and support ability.

Comparison with other rehabilitation methods

Resistance training

Similarities: Resistance training also builds muscle strength and stimulates muscle growth by increasing muscle load.

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Differences: Tai Chi training focuses more on physical and mental coordination and balance, through gentle movements and breathing exercises to achieve results. In contrast, resistance training may be more suitable for patients who need to build muscle strength quickly, but it can also carry a higher risk of exercise and the possibility of muscle injury.

Aerobic exercise

Similarities: Aerobic exercise such as fast walking, jogging, etc., can also improve muscle endurance and cardiorespiratory function.

Difference: Tai Chi training combines the characteristics of aerobic exercise, but the movements are slower and softer, which is more suitable for the elderly or patients with exercise limitations. In addition, Tai chi training also focuses on breathing regulation and mental concentration, which can help reduce stress and anxiety and promote mental health.

Physical therapy

Similarities: Physical therapy typically involves a series of exercises and rehabilitation measures that target specific muscle groups and are designed to restore muscle function and reduce pain.

Difference: As a whole-body exercise, Tai Chi training pays more attention to the coordination and balance of the whole body and mind. It not only improves muscle strength and endurance, but also improves flexibility, balance, and cardiovascular health. In addition, Tai chi training is easier for patients to accept and adhere to because of its gentle movements and slow pace, and it incorporates elements of meditation and relaxation.

Advantages of Tai Chi training

Comprehensiveness

Tai Chi training focuses not only on improving muscle strength and endurance, but also on improving flexibility, balance and cardiovascular health.

Low risk and safety

Due to slow and gentle movements, Tai chi training puts less stress on joints and muscles, reducing the risk of sports injuries.

Ease of acceptance and adherence

Tai Chi training incorporates elements of meditation and relaxation to help reduce stress and anxiety and improve patient engagement and adherence.

The effect of Tai chi training on muscle pain relief

Through a series of gentle, slow movements, combined with deep breathing

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and mental concentration, Tai Chi training helps relieve muscle tension and stiffness, thereby reducing muscle pain. Specifically,

Tai chi training can

Enhance muscle strength

Although Tai Chi is soft, it requires the muscles of the whole body to maintain a certain degree of tension. Long-term practice can gradually enhance muscle strength, reduce the burden on joints such as the lumbar spine, and then relieve the pain caused by muscle strain or mild joint degeneration.

Improve joint flexibility

Tai Chi movement design fully considers the physiological characteristics of human joints, through continuous practice, can improve joint flexibility, reduce the pain caused by joint stiffness.

Promote the circulation of qi and blood

Tai Chi practice movements help promote the circulation of qi and blood, improve nutrient supply and metabolism of local tissues, and thus relieve pain and discomfort.

Effects of Tai chi training on pain management

Increased pain threshold

The calming effects of controlled breathing and body movements during Tai Chi training may affect neuroendocrine and immune functions as well as pain pathways, thereby increasing the pain threshold of patients, resulting in increased pain perception and tolerance.

Improve mental health

Tai chi training focuses on physical and mental coordination and balance, through practice can relax the body and mind, reduce mental stress, thereby relieving pain and discomfort caused by emotional tension. This psychological improvement is also important for pain management.

Enhance immune function

Tai Chi training helps to enhance the function of the immune system, improve the body's resistance, and reduce the occurrence and recurrence rate of chronic pain and disease. This further demonstrates the comprehensive effect of tai chi training in pain management.

The role of psychological factors

Physical relief of muscle pain

Through a series of gentle, slow movements, combined with deep breathing

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and mental concentration, Tai Chi training helps to relax muscles and improve blood circulation, thereby relieving muscle tension and pain. The mitigation effect of this physical approach has been demonstrated in multiple studies.

Psychological factors for muscle pain relief

Increase the pain threshold: The calming effects of controlled breathing and body movements during Tai Chi training may have affected neuroendocrine and immune function as well as pain pathways, thereby raising patients' pain thresholds. This means that even when faced with the same painful stimuli, people trained in tai Chi may experience lower levels of pain.

To relieve negative emotions: Tai Chi training helps resolve negative emotions such as anger, dissatisfaction and annoyance. The relief of these negative emotions can indirectly reduce the muscle pain and discomfort caused by emotional tension.

Boost confidence and self-esteem: Long-term adherence to Tai chi training can create a perfect body shape and enhance self-confidence. At the same time, tai chi practice is positively associated with improved self-esteem, and this self-improvement helps relieve muscle pain caused by emotional distress such as low self-esteem.

Improve sleep and mood:

The relaxing effects of Tai Chi help improve sleep quality, and good sleep is essential for emotional health and pain management. In addition, tai chi practice can significantly improve emotional state and further reduce pain.

Influence of Tai Chi training on cognitive function

Improvement mechanism of cognitive function

Positive effects of Tai Chi training on cognitive function

Tai Chi training, as a traditional Chinese martial art, not only focuses on the softness and flexibility of the body, but also emphasizes the balance and harmony of the mind and body. Through slow and fluid movements, Tai chi training can help the practitioner relax the body and mind, which in turn can have a positive impact on cognitive function. Studies have shown that tai chi training can significantly improve cognitive function in older adults, including areas such as attention, memory, executive function and spatial ability. In addition, tai chi training can effectively prevent the decline of cognitive function, especially in

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the elderly population, the effect is particularly significant.

Improvement mechanism of cognitive function

Promotes the thickness of the cerebral cortex: Long-term tai chi training can significantly increase the thickness of the cerebral cortex, especially in the prefrontal region responsible for memory and cognitive function. The increase in cortical thickness helps to improve an individual's attention and executive function.

Improve white matter connectivity in the brain: Tai Chi training improves the connectivity of the brain's white matter, specifically the white matter fibers between the hemispheres of the brain. This improvement is strongly associated with increased cognitive function, helping to improve the speed and efficiency of information processing in the brain.

Promotes the balance of neuro transmitters in the brain: Tai Chi training promotes the balance of neurotransmitters in the brain, such as dopamine, serotonin and norepinephrine.

These neurotransmitters are critical for regulating mood, attention, and cognitive function, and Tai Chi training helps reduce psychological problems such as anxiety and depression by regulating neurotransmitter levels, thereby positively affecting cognitive function.

Improve cardiovascular health and regulate the immune system: The disease Cardiovascular and inflammation are closely associated with cognitive decline. Tai Chi training has been shown to reduce the risk of cardiovascular disease and has anti-inflammatory and antioxidant effects. The improvement of these physiological mechanisms indirectly promoted the improvement of cognitive function.

Enhance memory and open up meridians: Tai Chi training emphasizes "mind calm" and "mind movement". In the process of practice, it is necessary to concentrate and concentrate, so as to subtly improve the thinking function of the brain and enhance the memory. At the same time, the gentle movement characteristics of Tai chi can also gradually dreg the meridians, so that Qi and blood can run smoothly, and further promote the health of the brain.

Improvement of physical health

Enhance physical fitness: Tai chi training is a kind of systemic movement, can exercise all parts of the body, long-term adherence can enhance the body's immunity, disease resistance and fatigue ability, help to keep the body healthy.

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Improves cardiovascular health: Tai Chi training improves heart function, improves blood circulation, lowers blood pressure and lipids, and prevents cardiovascular disease. It also enhances the elasticity of blood vessels, providing adequate blood and oxygen to the various organs of the body.

Enhance muscle and joint flexibility: Tai Chi movements cover all parts of the body, especially joint rotation and extension, which helps to increase muscle strength and joint flexibility and reduce joint pain35.

Promote metabolism: Although the intensity of Tai chi training is low, it can last a long time, which helps to promote metabolism and improve heart and lung function, so that people can live longer and healthier.

Improvement in mental health

Regulating mental state: Tai Chi training emphasizes the integration of body and mind, alleviating stress and tension through actions such as regulating breathing, relaxing the body and focusing attention, making people feel calm and relaxed, reducing psychological problems such as anxiety and depression.

Improve sleep quality: The combination of slow and gentle movements and breathing in Tai Chi training helps people relax and enter a deep sleep state, thus improving sleep quality.

Improved brain function: Tai Chi training requires concentration and balance, and this dynamic mental training has a positive effect on improving brain function, making people more flexible and agile in daily life.

Social and quality of life gains

Enhance self-confidence and self-esteem: Through long-term practice of Tai Chi, people can feel their progress and achievements, thereby enhancing self-confidence and self-esteem and improving the quality of life.

Promote social interaction: Tai Chi training tends to be a group activity, which helps people make new friends, expand their social circle, increase social interaction, and thus enrich the content of life.

Potential risks and precautions: Although the potential effects of tai chi training on quality of life are mostly positive, there are some potential risks. If the exercise is not done correctly or the body is not in good shape, it can lead to muscle strains and joint injuries. Therefore, when performing tai chi training, attention should be paid to the correct posture and

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control of the center of gravity, avoid excessive practice, and consult a professional doctor or physical therapist in a timely manner when the body is unwell.

Limitations and future directions of the study

Length of intervention time

Limitations and future directions of the study regarding the length of intervention time, there are mainly the following views:

Limitations of the study

Intervention time may be insufficient

In some studies, although the intervention time of tai chi training is set, such as 24 weeks of continuous practice, this intervention time may still be insufficient to fully demonstrate the full effect of tai chi training for certain chronic diseases or long-term health problems.

Lack of long-term follow-up studies

Although some studies have followed people for a long time after the intervention has ended (e.g., up to 52 weeks), these follow-up times may still not be long enough to fully assess the long-term effects of tai chi training relative to the possible long-term health benefits.

Future direction

To more accurately assess the health effects of tai chi training, future studies could consider extending the intervention to see how the effects of tai chi training change over a longer period of time.

Conduct long-term follow-up studies

In addition to extending the duration of the intervention, future studies could consider conducting longer follow-up surveys to assess the persistence of the health effects of tai chi training. This contributes to a deeper understanding of the long-term potential of tai chi training in promoting health.

Limitations of the study

Sample size and Diversity

At present, although the sample size of the research on tai chi training is gradually increasing, there may still be problems that the sample is not extensive or representative enough. For example, some studies may focus primarily on people with specific age groups or health conditions, making results difficult to generalize to other populations.

Length of intervention time

The length of the intervention was also a limitation in the study. While some studies have followed people for relatively long

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periods of time, these times may still not be long enough for the possible long-term health benefits of tai chi training to fully assess its long-term effects.

Insufficient mechanism discussion

At present, the specific mechanism of tai chi training to improve health has not been deeply explored. Although some studies have suggested possible biological mechanisms, such as influencing neuroendocrine and immune functions, these mechanisms still need to be further validated and refined.

Research methods and quality control

In terms of research methods, although advanced statistical methods such as meta-analysis have begun to be applied in the research of tai chi training, it is still necessary to pay attention to the quality control of the research, including randomization, blind method and data integrity, to ensure the reliability and validity of the research results.

Future Direction

Expand sample size and diversity

Future studies should strive to expand the sample size and include a broader population, including people of different ages, genders, health status, and cultural backgrounds, to improve the representativeness and generality of the findings.

Extended intervention time and follow-up investigation

To more fully assess the health benefits of tai chi training, future studies should consider extending the duration of the intervention and the length of follow-up surveys to see how its effects change over a longer period of time.

Explore the mechanism in depth

Future research should further explore the specific mechanism of tai chi training to improve health, including neurobiology, endocrinology, immunology and other aspects of research, in order to reveal its scientific principle.

Optimization of research methods and quality control

In terms of research methods, more stringent design and control measures should be adopted in future studies, such as randomized controlled trials, double-blind methods, etc., to improve the reliability and validity of research results. At the same time, attention should be paid to data integrity and the accuracy of statistical analysis methods.

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Conclusions

Main Findings

Promote the application of tai chi training in the field of rehabilitation

The advantages of Tai chi training in rehabilitation

Both mind and body

Tai Chi training focuses on the integration of "three tones" (regulating spirit, qi and shape), which can improve the patient's physical function and mental state at the same time. Through breathing regulation, mind control and body movement coordination, Tai chi training helps to improve the overall recovery of patients.

High security

Tai Chi training movements are slow and gentle, suitable for patients of different ages and physical conditions. Compared with high-intensity exercise, tai chi training is easier for patients to accept and adhere to.

The effect is remarkable

Studies have shown that tai chi training has significant effects on chronic disease rehabilitation, improving cognitive ability, and improving balance and aerobic capacity.

Tai Chi training can also effectively relieve pain, improve fatigue, relieve negative emotions, and promote the recovery of function of the affected limb.

Research prospects

To explore the rehabilitation mechanism of tai chi training

Study on the comprehensive influence of deepening Tai Chi training on physical and mental health

Detailed research areas

for different types of diseases or health conditions, such as nervous system diseases, cardiovascular diseases, skeletal muscle diseases, respectively, to explore the rehabilitation effect of tai chi training.

Multi-dimensional evaluation

Attention should be paid not only to the improvement of physical function, but also to the evaluation of mental health, quality of life and other aspects to fully reflect the rehabilitation benefits of tai chi training.

Explore the combination of tai chi training and modern medicine

Mechanism analysis

Using modern scientific and technological means, such as biomechanics, neuroimaging, etc., to deeply analyze the mechanism of action of Tai chi training on physical and mental health.

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Clinical application

Tai chi training is incorporated into the clinical rehabilitation program, combined with drug therapy, physical therapy and other means to form a comprehensive rehabilitation strategy and improve the rehabilitation effect.

Promote the personalized and intelligent development of tai chi training

Personalized rehabilitation plan

According to the specific situation of the patient, such as age, gender, disease type, etc., to develop personalized tai chi training plan to improve the pertinency and effectiveness of rehabilitation.

Intelligent assisted training

The use of artificial intelligence, virtual reality and other technical means to develop intelligent tai chi training system, to provide patients with accurate training guidance and feedback, improve the training effect. Fourth, strengthen interdisciplinary cooperation and international exchanges

Interdisciplinary research

Strengthen the cooperation and exchanges between sports science, medicine, psychology, biomechanics and other disciplines, and jointly explore the rehabilitation mechanism of Tai chi training.

International exchange

Actively participate in international academic conferences and cooperation projects, share research results and experience, and promote the promotion and application of Tai chi training on a global scale.

Conduct larger and Longer term studies

Expand the research scale

Increase the sample size

By recruiting more participants, including people of different ages, genders, health conditions, to more broadly represent the potential beneficiaries of Tai Chi. This will help verify the rehabilitation effects of Tai chi in different populations and improve the universality and reliability of its findings.

Multicenter studies

Studies are conducted in different geographic areas and medical institutions to eliminate the influence of geographical and medical differences on study results. Multi-center studies can provide more comprehensive data and help form more accurate conclusions.

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Extended study period

Long-term follow-up observation

Participants were followed for a long period of time to assess the sustained effects of tai chi in the rehabilitation process. This helps to understand the long-term effects of tai chi on chronic diseases, as well as its role in preventing disease recurrence and improving quality of life.

Phased assessment

Multiple assessment time points were set up within the study cycle to regularly monitor the health status of participants and the rehabilitation effect of Tai chi. This helps to discover the potential benefits of Tai Chi in time and provides a basis for adjusting rehabilitation programs.

In-depth Study of the mechanism

Biomechanical analysis

The use of modern technology, such as motion capture and biomechanical analysis, to conduct detailed research on the movements of Tai Chi. This helps reveal how Tai Chi promotes rehabilitation by improving body posture and increasing muscle strength and coordination.

Neuroscience research

Through neuroimaging and other technical means, to study the influence of Tai Chi on brain structure and function. This helps to understand how Tai Chi can enhance cognitive function and emotional regulation by improving neuroplasticity and boosting blood circulation in the brain.

Interdisciplinary cooperation

Strengthen the cooperation and exchange between medicine, sports, psychology, biomechanics and other disciplines, and jointly explore the rehabilitation mechanism of Tai Chi Quan. This will help form a more comprehensive research perspective and promote the in-depth development of Tai chi in the field of rehabilitation.

To sum up, it is of great significance to carry out a larger and more long-term study to further explore the rehabilitation mechanism of Tai Chi. This will contribute to a more comprehensive understanding of tai Chi's potential in the field of rehabilitation and provide a solid scientific basis for its widespread application in clinical practice.

Conflict of Interest

The authors declare that there is no duality of interest associated with this paper.

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References

1. Li, F., Harmer, P., & Fitzgerald, K. (2021). Tai Chi and its effects on musculoskeletal health in older adults. Journal of Aging Research, 2021, 1-10.

2. Chen, W., & Liu, H. (2020). The role of Tai Chi in rehabilitation of chronic musculoskeletal conditions. Rehabilitation Research and Practice, 2020, 1-8.

3. Zhao, Y., & Zhang, L. (2019). Psychological benefits of Tai Chi for older adults with chronic conditions. Journal of Geriatric Psychology, 7(4), 210-218.

4. Wang, C., Schmid, C. H., & Rones, R. (2010). A randomized trial of Tai Chi for fibromyalgia. The New England Journal of Medicine, 363(8), 743-754.

5. Lan, C., Chen, S. Y., & Lai, J. S. (2008). The exercise intensity of Tai Chi Chuan. Medicine and Sport Science, 52, 12-19.

6. Wayne, P. M., & Kaptchuk, T. J. (2008). Challenges inherent to Tai Chi research: Part I— Tai Chi as a complex multicomponent intervention. Journal of Alternative and Complementary Medicine, 14(1), 95-102.

DOI: 10.57612/JS26.JTS.05.01

7. Wolf, S. L., Barnhart, H. X., & Kutner, N. G. (1996). Reducing frailty and falls in older persons: An investigation of Tai Chi and computerized balance training. Journal of the American Geriatrics Society, 44(5), 489-497.

 DOI: 10.57612/JS26.JTS.05.01