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APPLICATIONS OF THE AI CHI METHOD IN AQUATIC PROGRAMS - A REVIEW OF LITERATURE

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Abstract

Aquatic therapy can be applied in the rehabilitation of all sort of cases with musculoskeletal system dysfunctions and for reducing level of anxiety and stress is because the water at the right temperature and movements that are done in the water, has a relaxing effect. Also, the horizontal position of the body in water has a multiple effect because it changes the blood circulation from vertical to horizontal, relieves weight off the spine contributing to pain relief, reduce fatigue, improves trunk endurance, balance, sleep quality and reduce anxiety and depression.

The purpose of the review was to assess if there are studies about the effectiveness of the Ai Chi method in aquatic recovery programs for people with different conditions and/or for achieving a better state of relaxation.

A systematic review of articles in the Science Direct browser from 1994 with keywords "Ai Chi, rehabilitation, relaxation" was used in the article.

Introduction

The Ai Chi method is based on the realization of an aquatic exercise program involving relaxation methods. It is designed to help the fluid and strong progression of the movements performed by the patient and the therapist. Ai Chi aquatic therapeutic programs are beneficial for all parties involved in the activity, the patient and the physical therapist.

The many benefits of Ai Chi come from respiration and relaxation, linked to the relaxed contemplative state. The method has a strong positive impact on removal of musculoskeletal and chronic pain in cardiopulmonary conditions, as well as in vascular and metabolic conditions and in psychological, neurobiological and cognitive conditions. [1, 2]

Material-method

The purpose of this review was to assess if there are studies about the effectiveness of the Ai Chi method in aquatic recovery programs for people with different conditions and/or for achieving a better state of relaxation.

Only articles in English from 1996 to the present were analyzed. (Table 1)

Table 1. Keywords search strategy

Detabases	Eligible sources criteria Ai Chi Aquatic		Non eligible sources	
	Rehabilitation	Relaxation	Rehabilitation	Relaxation
ScienceDirect	63	60	60	59

In the ScienceDirect research date base, were searched using different combination of keywords. A systematic review of articles from 1994 with keywords "Ai Chi aquatic rehabilitation, relaxation" was used in the article 123 bibliographic sources were extracted from this database, and ultimately 3 sources were included in this review. The eligible sources were included based on the following criteria: 1) studies focusing on research; 2) review articles; 3) rehabilitation and relaxation related topics. Conversely, sources were excluded based on the following criteria: 1) they were non-human studies (animal studies); 2) contained sport nonrelated data; 3) they were not related to the specific theme investigated or not enough information was available.

The general and most important roles that Ai Chi aquatic programmes are doing for the pacients are to be found in the Figure 1.

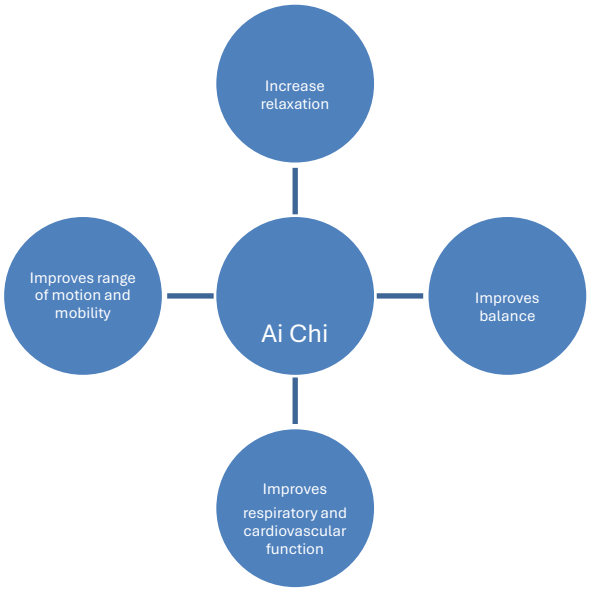

Figure 1. The role of the aquatic Ai Chi programmes

This framework will help in understanding how Ai Chi can be used for different therapeutic purposes and what effects are expected in various contexts.

Systematization of Ai Chi Method Applications.

1. Conditions Treated by Ai Chi:

- Musculoskeletal Conditions
  - Chronic pain (e.g., back pain, osteoarthritis) [3, 4]
  - Scoliosis
  - Carpal tunnel syndrome
  - Recovery from musculoskeletal injuries
  - Post-surgical recovery (e.g., orthopedics, sports injuries) [5]
- Cardiopulmonary Conditions [6]
  - Compromised respiratory function (e.g., pulmonary surgery recovery)
  - High blood pressure (essential hypertension)
  - Cardiac rehabilitation
  - Vascular conditions
- Mental Health and Psychological Conditions [7]
  - Anxiety and depressive disorders [1, 2]
  - Stress-related symptoms (e.g., insomnia, muscle tension)
  - Cognitive decline in elderly (improving cognitive function) [2]
  - Rehabilitation of patients with neurological disorders (e.g., Parkinson's disease, dementia) [1, 2, 4]
- General Health and Wellness [1, 2]
  - Enhancing overall health and physical fitness [1, 2]

- Improving balance and stability [1, 2]
- Promoting relaxation and well-being [1, 2]

2. Effects of Ai Chi on Patients

- Physical Effects
  - Reduced muscle tension and stress
  - Improved mobility and range of motion [1, 2]
  - Enhanced muscle strength, endurance, and postural stability
  - Decreased perception of pain and discomfort [1]
  - Promotion of relaxation and fatigue reduction
- Physiological Effects [1, 2]
  - Improved cardiovascular function (e.g., heart rate variability, blood pressure reduction)
  - Enhanced respiratory function (e.g., increased lung capacity, improved oxygen exchange)
  - Increased venous return and lymphatic flow
  - Stabilization of autonomic nervous system responses
- Psychological Effects
  - Increased cognitive awareness and mindfulness
  - Reduction of anxiety, depression, and related symptoms [1]
  - Promotion of a sense of autonomy and independence [1, 2]
  - Improvement in emotional regulation and stress management
- Social Effects [1, 2]
  - Facilitation of social interaction during therapeutic sessions [1, 2]
  - Encouragement of community building among participants [1, 2]
  - Increased motivation and commitment to rehabilitation programs

3. Implementation in Therapeutic Contexts

- Rehabilitation Settings [8, 9, 10]
  - Programs tailored to individual patient needs (e.g., rationale built around specific conditions) [4]
  - Pairing Ai Chi with other therapeutic modalities (e.g., conventional physiotherapy)
  - Use of warm water to promote relaxation and decrease muscle stiffness
- Community and Elderly Programs [1, 7]
  - Group sessions aimed at fostering social engagement and community support
  - Special adaptations for elderly populations focusing on balance and fall prevention
  - Integration into wellness programs for stress management
- Research and Evidence-Based Practice

- Continuous assessment of patient outcomes to evaluate the effectiveness of Ai Chi
- Documentation of benefits and patient satisfaction to contribute to greater acceptance of this technique in rehabilitation frameworks
- Use of systematic reviews to support clinical guidelines and treatment protocols

Literature review

The Ai Chi method is based on developing an aquatic exercise program that involves relaxation methods. It is created by Jun Konno and is designed to help the fluid and strong progression of the movements performed by the patient and the therapist. Ai Chi aquatic therapeutic programs are beneficial for all parties involved in the activity. Through accurate, rhythmic and relaxed executions, the area of movement and mobility can be improved. Ai Chi technique is created by combining the Tai Chi method with Shiatsu concepts and Watsu techniques. It is made from vertical to water-to-shoulder levels, using deep breathing combinations and slow, wide arms, legs and trunk movements and the ideal pool temperature of 310 C to 35,50 C.

In Ai Chi practice, posture and activity are emphasized through the vertical axis of the body to keep the mind and body in balance. [10] Ai Chi is a new way of working for high-speed movements or for those who have developed incorrect motion models as a result of a lesion or surgery and helps in regaining of correct movements. Ai Chi has particular qualities given by the water characteristics as buoyancy, hydrostatic pressure, resistance and restlessness.

In Ai Chi therapy people is aware of muscle activity and movement patterns, with attention to body posture and breathing, combined with visualization and vertical positioning images that help place the body in the right alignment.

Like Tai Chi, Ai Chi combines slow, fluid rhythmic movements with controlled breathing. Motion patterns involve large body muscle groups in symmetrical or asymmetric movements in both feet or on one foot, exercises that can improve mobility and strength. When combined with diaphragmatic breathing, these motion patterns can amplify relaxation and reduce pain.

Most of the benefits in using this method in the hydrotherapeutic recovery process are reducing stress, increasing energy levels, increasing caloric intake and better movement, are a result of deep breathing. Breathing is physical function both voluntarily and involuntarily [11]. To get a relaxed state, breathing and mind must be in harmony to control breathing.

Recently clinical studies have been developed on the benefits of Tai Chi techniques combined with hydrotherapy. Both types of treatment include physical training of balance, mobility, strength, coordination and sensory input that could complement each other.[12]

In Ai Chi, diaphragmatic breathing and respiratory physiological system is most effective:

- extends the diaphragmatic floor of the descending thoracic cavity [13] and determines the enlargement of the chest,
- it produces negative pressure in the chest, which forces the air in the lungs and pulls blood in the chest, increases venous return to the heart [11],
- improves the lymph flow, which is rich in immune system cells, thus contributing to the prevention of infection in the lungs and other tissues [11],
- it draws oxygen in the deepest parts of the lungs of the lungs where better exchange takes place, increasing the supply of oxygen and nutrients to tissues and the removal of carbon dioxide [11],
- is neccessary relaxation of abdominal muscles during inspiration.

Chest respiration is ineffective because the largest amount of blood flow occurs in the lower lobes of the lungs, areas that are not well oxygenated. Chest breathing moves up the chest cavity during breathing at maximum capacity during intense exercise.

Benefits of Ai Chi. Many of the benefits of Ai Chi come from breathing and relaxation, related to the relaxed contemplative state.

Musculoskeletal and chronic pain as an example for which this method is very appropriate to practice.

Ai Chi techniques of motion and diaphragmatic breathing on slow path have proved to:

~ increase relaxation,
~ lower muscle tension,
~ improve control of symptoms,
~ facilitate recovery after back pain related conditions,
~ eleviate condition in scoliosis and carpal tunnel syndrome,
~ help after musculoskeletal injuries, sports injuries and surgical interventions, from the effects of buoyancy, gentle and controlled movement, and coordinated breathing,
~ relieves the symptoms of osteoarthritis,
~ improve the overall health,
~ enhance muscle strength and lower end resistance,
~ positively affects the postural stability, important in the elderly, [14]
~ reduces the response to stress-induced pain that traditionally increases muscle tension,
~ alignment, balance and stabilization are skills that can be improved by slow motion techniques; the balance learned in water translates well on land,
~ sinking joints diminishes compression and joint swelling [15],
~ water properties combined with Ai Chi movements can improve the range of motion and mobility.

From a musculoskeletal point of view, the area of movement is an effective means of maintaining the integrity of connective structures and soft tissues.

Cardiopulmonary, vascular and metabolic conditions is another reason for which this hidrotherapeutic method can be successfully used.

In different studies of Tai Chi programs, positive cardiovascular effects were found [16] as well as:

~ oxygen consumption and significantly higher workload,

~ increased cardiorespiratory function,

~ soft tissue flexibility,

~ the practice of slow-motion techniques and diaphragmatic respiration activates the inhibitory parasympathetic nervous system. [17]

~ decreases heart rate, reduces blood pressure,

~ improving respiratory and cardiovascular function,

~ it reduces the consumption of oxygen,

~ creates a neutral respiratory coefficient and lowers blood lipid levels [18],

~ reduce vegetative instability and improve heart rate variability [19],

~ Ai Chi respiration can inhibit neuronal responses because a stress response produces an increase in the respiratory rate, decreases the tidal volume, and a change in chest breathing occurs [20],

~ the challenge of a parasympathetic or inhibitory response increases vagal modulation, decreases heart rate [21], thus improving the breathing function,

~ diaphragmatic breathing exercises reduced postoperative complications in patients who underwent cardiac or pulmonary surgery [22],

~ lowering blood pressure and anxiety are the results of relaxation accompanying diaphragmatic respiration [20],

~ it helps in reducing Parkinsonian symptoms as measured on different motor symptoms, bradykinesia and rigidity [23], [24],

~ Ai Chi breathing as a form of treatment is beneficial in lowering essential hypertension (high blood pressure due to unknown causes) that is common in our society.

From a psychological point of view, through cognitive stimulation, physical activity and social interaction Tai Chi elevates the cognitive functions to elderly people.

Practicing slow motion techniques accompanied by diaphragmatic breathing produces activation of the right hemisphere; decreases sympathetic nervous system excitation and increases awareness; lowers the activation of the hypothalamo - hypophysi - suprarenal axis [21] and improves the psychological state associated with chronic illness, anxiety and depressive disorders, anger management and stress-related arrhythmias [17].

Diaphragmatic breathing has been shown to alleviate the response to stress; stress that can contribute to malaise such as back pain, neck tension, headaches,

fibrochastic nodules, muscle spasms, indigestion, stomach burns, stomach ulcers, palpitations, shoulder and chest pain, insomnia, sleep disturbances, anxiety, depression, dyspnea, nausea and fatigue [11]. Stress increases muscle tension and vasoconstriction, thereby reducing blood flow throughout the body [11]. "Throat tension causes muscle aches and headaches; stomach tension affects digestion and tension in the body increases blood pressure. Relaxation through diaphragmatic breath reduces blood pressure and workload of the heart and decreases muscle tension "[17].

Discussions

Although aquatic relaxation methods and especially the Ai Chi method represent an approach focused on improving the level of physical fitness, recent studies reveal that people in various stages of recovery and who benefit from recovery through these methods reach a faster level of recovery, especially due to the psychological advantages it has on the nervous system [5, 17]. Through physical relaxation, tasks such as relieving fatigue, regaining balance and autonomy, losing stiffness and pain [3] can be accomplished. Through mental relaxation, recovery programs that require consistency and perseverance can be completed. These programs are necessary for people with conditions such as multiple sclerosis, dementia, aneurysms, polymyalgia rheumatica and rheumatoid arthritis, but Ai Chi is more [25]. It is recommended to reduce high levels of stress and other disorders that limit movement or energy because water, movement, and music are used to encourage a state of relaxed awareness and reduce depression [1]. The warm water allows for slow, relaxed movement and increased blood flow to joints, tendons, muscles and ligaments.

Conclusions

The most important benefits of Tai Chi program are enhanced stability and flexibility and ensuring a state of well-being through psychological effects.

The Ai Chi method offers a versatile and effective therapeutic approach that can be applied across a variety of conditions. Its benefits span physical, physiological, psychological, and social domains, making it a valuable technique in both rehabilitation and wellness settings. For practitioners and researchers, this systematic framework can aid in understanding the multifaceted applications of Ai Chi and optimally integrating it into therapeutic practices.

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