Interdisciplinary Research Evaluation: Feasibility of Tai Chi as Lifelong Exercise

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Tutorial Abstract:

Tai Chi, one of the traditional Chinese martial arts, has been used as health intervention in many studies worldwide. Researchers have reported the benefits of Tai Chi practice from balance improvement, fall prevention, high blood pressure management, to cardiovascular diseases prevention, and beyond. Can everyone learn Tai Chi? How do we learn Tai Chi? Can everyone benefit from practicing Tai Chi? Is there any risk associated with Tai Chi exercise? How much Tai Chi practice is enough to generate quantifiable health benefits? The purpose of this tutorial is to investigate the feasibility of using Tai Chi as a lifelong health intervention in the society. Biomechanical, physiological and other evidences of Tai Chi's health benefits will be discussed first. For more detailed discussion, Tai Chi for knee joint health will be discussed as more detailed example. The pros and cons will be compared. Proper instruction will be addressed. After presenting the evidences that tai Chi is good for you, we will then discuss the feasibility of promoting Tai Chi as lifelong exercise in the community. Can we start tai Chi education from secondary and higher education? Related pedagogical issues will be analyzed. Lastly we will discuss how we measure the physical activity level of Tai Chi. It is important to know it is beneficial and feasible to use Tai Chi as lifelong exercises to address the variety health problems facing the modern society.

Specific Abstracts:

Biomechanical Benefits of Tai Chi Exercise

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Falls and related injury among older adults are a serious public health problem leading to widespread loss of independence, increases in the chronic disease mortality rate, and the need for costly long-term care. Approximately 35% to 40% of community-dwelling elderly 65 or older fall annually (1). Approximately 5% to 15% of these falls result in serious injury requiring hospitalization (1). Exercise has been a key feature in reducing the risks for falls and related injuries. Tai Chi has become a popular choice of exercise among certain populations. The American Geriatrics Society, the British Geriatrics Society, and the American Academy of Orthopedic Surgeons has suggested that Tai Chi "... is a promising type of exercise, although it requires further evaluation before it can be recommended as the preferred balance training" (1). Based on this recommendation, we conducted a study to exam the effects of a 24-week Tai Chi intervention on physical function in individuals with peripheral neuropathy. Twenty-five women and men with peripheral neuropathy were recruited. Plantar pressure detection threshold was assessed with a 5.07 gauge monofilament. Functional gait was assessed by the 6-minute walk and timed up-and-go tests. Isokinetic leg strength and standing balance was also assessed. Twenty-four consecutive weeks of modified, group-based Tai Chi practice was completed, with testing repeated every six weeks throughout. No adverse events were observed and attendance was 17 ± 4 sessions per 6-weeks. After 6-weeks of Tai Chi, participants increased 6-minute walk ($p < .0001$), timed up-and-go ($p < .0001$), and leg strength ($p < .01$) performance. Continued improvement was observed in the timed up-and-go. Plantar sensation improved ($p = .003$) following the Tai Chi intervention. Group-based Tai Chi is a safe, plausible, and effective intervention for those with PN. **Reference**: 1. American Geriatrics Society, British Geriatrics Society,

and American Academy of Orthopaedic Surgeons Panel on Falls Prevention. Guideline for the prevention of falls in older persons. J Am Geriatr SM: 2001;49:664-672.

Knee Joint: Example of Tai Chi for Life Span Health

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Tai Chi as one of health exercises is becoming more and more popular in the world. Many studies show the evidence Tai Chi can improve balance, prevent fall. As an example of its health benefits, Tai Chi is an effective treatment for knee osteoarthritis in older adults showed by many studies. In addition, Tai Chi exercise can lead to significant reduction of knee pain. Despite many positive reports, some reports caution that Tai Chi may also cause practitioners' knee pain; even some practitioners cease to practice due to Tai Chi induced knee pain. We have surveyed 1000 Tai Chi practitioners in the greater Shanghai metropolitan area. Our results detailed the demographics of Tai Chi practitioners in the area. We also will present an analysis of multiple knee health related questions. In addition, the relation of knee joint health and Tai Chi practice were investigated. One of our results showed that approximately 50% Tai chi practitioners reported they had knee pain before they have started Tai chi practice. Most Tai chi practitioners who have knee pain symptom agree that Tai chi exercise can effective reduce knee pain. This result is consistent with former studies. Based on the literature and our data, Tai Chi practice with proper caution can increase knee joint health, prevent degenerative knee joint disease and improve practitioners' quality of life.

Pedagogical Consideration: How do I Teach to My Students?

Ping Xiang, PhD, presenting author, Texas A&M University, College Station, TX, Jinjin Yang, Southern Connecticut State University

Promoting and increasing students' physical activity levels in schools has been identified critical to our efforts to fight the epidemic of overweight and obesity among children and youth in this country. Consequently, physical education teachers are urged to teach students lifelong physical activities or exercises (e.g., jogging, golf) so they can participate in them throughout their lifespan. As a lifetime exercise, Taichi (primarily in the form of 24 Yang Style Tai Chi Chuan Form) has been taught in schools, particularly secondary schools and universities, in China for the last 30 years. Additionally, considerable research has documented physical, health, psychological, and social benefits of Taichi for people of different ages or with different health conditions (e.g., Larkey, Jahnke, Etnier, & Gonzalez, 2009; Yan, 1995). Taken together, we believe Taichi can also become a lifetime activity for students, especially students at secondary schools or higher, in US. Accordingly, this presentation will provide beneficial information to teachers and youth program instructors who are interested in teaching Taichi as a lifetime activity to promote physical activity among children and youth. Specifically, two topics will be covered in the presentation. They are: (a) What 24 Yang Style Tai Chi Chuan Form is and why it is most taught in schools in China. The emphasis will be on its uniqueness in comparison to other forms of Taichi. And (b) Pedagogical Considerations. There are a number of pedagogical considerations associated with teaching Taichi. For example, the 24 Yang Style Tai Chi Chuan Form is characterized by soft, slow, circular, and gentle movements and thus it may not look appealing to some students. This can raise an issue of student interest. Motivation research in both classroom and physical education reveals students with high interest in learning activities achieve more and perform better in those activities than students who show low interest (e.g.,

Chen, 2001; Schiefele, Krapp & Winteler, 1992). Therefore, how to initiate and sustain students' interest will be discussed along with other considerations.

Measurement Issues Related to Lifelong Comprehensive Benefits of Tai Chi

Yuanlong Liu

In recent years, Tai Chi has been one of the hot topics in public media, medical and health-related publications. It has been referenced as an effective exercise method to improve quality of life, mentally and physically. Some questions rise regarding the scientific evidences of the benefits of Tai Chi practice: What is the level of the scientific evidence available regarding the benefits of Tai Chi? Are the comprehensive benefits of Tai Chi measurable? What has been and what has not been (or cannot be) measured? To provide the preliminary answers of these questions, this study uses meta-analysis method to synthesize the scientific inquiry in last two decades on measuring comprehensive benefits of Tai Chi. The peer reviewed scientific publications are searched in major electronic databases (MEDLINE, ERIC and PSYCINFO). The publications in Chinese language are also referenced. The research publications confirmed following benefits of Tai Chi on a broad range of measures: (1) physical function including exercise intensity, activity tolerance and cardiovascular function, (2) physiological measures including blood pressure and lipid profiles, enhancing immune response, and improving flexibility and strength, (3) psychological measures including self-efficacy, sleep quality, mood and attitude. These synthesized results show there is clear scientific evidence regarding the effective benefits of Tai Chi practice in improving the function and quality of life. However, the results also lead us to conclude that there maybe lack of research focus on the why and how the Tai Chi practice affects the attributes mentioned above. There are few studies available regarding the biological mechanism of Tai Chi in the literature. The results also indicate that there maybe lack of communication among the researchers from different countries. There are many overlapped/redundant research published in different languages. In conclusion: Is the Tai Chi practice effective in producing lifelong comprehensive benefits? Yes, absolutely. Do we understand the biological mechanism of Tai Chi? Not yet in detail as we would like to. For example, it is difficult for researchers to understand the key concept "Qi" in Tai Chi. I am not sure whether it is a legitimate scientific question for the scientists and researchers: What is Qi in Tai Chi and can we measure it? Exploring answers on the biological mechanism of Tai Chi would be an exciting journey and we may have a long way to go.