

**Short Commentary**

A short commentary on traditional Chinese Sports on Elderly Adults with Frailty or Sarcopenia

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Sarcopenia is an emerging public health issue affecting a majority of the aging population worldwide. With the loss of muscle strength, mass, and poor physical performance, sarcopenia shows multiple clinical manifestations like frailty. Therefore, it is regarded as a major component of frailty. Furthermore, sarcopenia and frailty lead to poor prognosis, loss of independent movements, shorter health span, and higher risk of hospital admission and mortality. Due to the reversible nature of frailty, early identification and timely interventions for pre-frail elderly are cost-efficient and extremely crucial.

Both nutritional supplementation and physical exercises are effective interventions for sarcopenia and frailty. Among physical exercises, resistance training is the most promising method to combat the loss of muscle mass and strength. However, the physical capacity and willingness of the elderly to engage in physical activities have been reduced, thus, hampering adherence to physical activity prescriptions. Because of this, multiple investigators are now searching for alternatives and realizing the value of traditional Chinese sports, including Baduanjin, Tai Chi, and so on. Furthermore, these traditional Chinese exercises are slow-moving, mild, easy to learn, and suitable for the elderly to practice. It is well known that even the frailest patients might get benefits from physical exercise, even if they exercise while bedridden. During the COVID-19 pandemic, Chinese people were encouraged to practice traditional sports to improve health and boost immune function. Even the conscious ICU patients were instructed by health care staff to perform simplified movements originating from traditional sports for speedy rehabilitation. Therefore, traditional

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Chinese sports provide an alternative exercise strategy for frail patients who are intolerant of high-intensity resistance training or aerobic exercises.

Based on previous studies, traditional Chinese sports can improve muscle strength, physical performance, balance skills, metabolism, and boost immune function, thereby improving quality of life, extending healthspan, and reducing disability, hospital admission, and mortality rates. Moreover, traditional Chinese sports have multiple therapeutic targets apart from the effects of muscle wasting. The multi-faceted efficacy provides several health benefits in a short practicing period and hence, is popular among Chinese adults.

Traditional sports have a long history and have become a non-negligible component of a healthy lifestyle in China. Due to the deep-rooted concept of practicing traditional sports, Chinese people gather in the community square to practice traditional sports after sunset. Because of their immense popularity, Chinese investigators have reported several benefits of physical exercise with health workers, investigators, doctors, and so on, thus, providing a viable option in combatting frailty and sarcopenia. Hence, further studies are essential to provide valid evidence of the efficacy and safety of traditional sports on sarcopenia and frailty.

Besides the potential benefits of traditional sports, as aforementioned, several other advantages have been reported, like improving memory as well as amelioration of body pain and fatigue. However, only a few clinical trials have verified these improvements due to inadequate evaluation and quantification methods. Thus, well-designed randomized controlled trials are warranted to investigate the newly recognized effects of traditional exercises.

Although safe to practice, traditional sports also exhibit certain adverse events that include knee joint lesions, falls, sore muscles, etc., which occur due to improper exercising techniques or lack of basic training. Hence, undertaking training or being supervised by a professional coach while exercising could drastically eliminate the occurrence of adverse events. However, due to the vast aging population in China, professional coaching is limited. Most people either learn through online videos or have prior experience. Subsequently, China's General Administration of Sport has now set regulatory standards and recommended a simplified traditional sports regime to ensure maximum learning in a short time. For example, a recently announced strategy stated that simplified Tai Chi only contains eight arm movements in five steps. Moreover, simplified traditional sports also facilitate the conduction of clinical trials in a standard way to avoid bias.

Based on the newly announced consensus by the European Working Group on Sarcopenia in Older People, muscle strength, mass, and

physical performance are regarded as the foremost diagnostic criteria for sarcopenia. Subsequently, weight loss, fatigue, lower grip strength, slow walking speed, and poor physical performance are considered the screening criteria for frailty based on Fried's Frailty Index. Accordingly, skeletal muscle is considered the major therapeutic target and focus of scientific research, and many studies have investigated effective interventions to maintain muscle mass. With concept shifting, muscle strength has replaced muscle mass as the prime diagnostic criteria and therapeutic target. On the one hand, most interventions ameliorate the loss of muscle strength significantly but show marginal or no effect on muscle mass. On the other hand, muscle strength loss occurs before and faster than muscle mass loss, thus, implying the involvement of other factors besides muscle mass in muscle function deterioration. Muscle quality is now being recognized as a vital contributor to the loss of muscle strength and physical performance. Furthermore, the underlying mechanism leading to poor muscle quality includes lipid deposition and fibrosis, which cause extracellular matrix remodeling in muscle tissues. However, more research is needed on determining muscle quality, even though a consensus has not been reached regarding the evaluation of muscle quality clinically. Whether traditional sports have any effects on improving muscle quality is worth investigating.

Although skeletal muscle attracts the most attention in sarcopenia and frailty research, many other underlying mechanisms should be explored. In recent studies, immunosenescence is now regarded as a potential therapeutic target of frailty. Emerging evidence showed that

sarcopenic or frail patients are more likely to suffer from pneumonia and develop severe symptoms. It is suggested that the aging immune system causes a higher rate of complications and mortality. The skeletal muscle is not only the largest tissue for physical movements but can also regulate immunological and inflammatory responses by providing essential substances for the immune system. However, immunosenescence is closely related to the development of co-morbidity and frailty. Furthermore, immune function dysregulation in muscle tissue, like over-accumulation of inflammatory factors, might increase muscle wasting in the aging population. Although the benefits of traditional sports in rejuvenating the immune system of the elderly have been verified, further studies analyzing the effect of traditional sports on the immune system modulation in localized muscle tissue are needed.

In conclusion, traditional Chinese sports are a valued heritage asset that is gaining popularity among the vast aging population nowadays. More research should be conducted to validate existing scientific evidence and subsequently popularize these unique exercise prescriptions worldwide. As traditional sports show multiple beneficial effects on the human body in maintaining muscle health and vitality, more therapeutic targets should be explored in the future.



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