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Intervention Effects of Fitness Qigong on Stroke Patients

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Abstract:

A stroke is a kind of illness that damages brain tissue and is brought on by an abrupt rupture or blockage of a cerebral blood vessel, which stops the blood flow to the brain. Stroke has a high incidence in China and patients generally have a poor prognosis. There are two methods for the treatment of stroke, drugs, and rehabilitation intervention, but the price of stroke drugs is high, and it is easy to produce many adverse reactions; Rehabilitation interventions, on the other hand, require patients to travel to the hospital on a regular basis, and many patients often interrupt their treatment plans due to travel inconveniences. Therefore, there is an urgent need to explore a rehabilitation method with high economic benefit for stroke patients and can be carried out at home. Many studies have pointed out that Fitness Qigong is of great help to the cardiopulmonary, motor, and non-motor functions of stroke patients. Therefore, this paper discusses in detail the improvement mechanism of Fitness Qigong on stroke patients and proposes exercise prescription for them, hoping to provide a reference guide for stroke rehabilitation.

Keywords: Fitness Qigong; stroke; rehabilitation.

1. Introduction

A stroke is a condition where a blood artery in the brain suddenly bursts or becomes blocked, damaging brain tissue, resulting in impaired blood circulation to the brain, which can be divided into two categories: ischemic stroke and hemorrhagic stroke [1]. There's a high incidence of strokes clinically and it is estimated that 1 in every 6 people in the world will experience a stroke [2]. In China, a stroke occurs every 12 seconds, while a stroke-related death occurs every 21 seconds, patients often have a poor prognosis, they are prone to hemiplegia and other complications. The statistics have shown that, almost 75% of stroke patients perform varying degrees of disability. It is estimated that with the increasingly population and aging, which will bring more disabled stroke survivors, this will undoubtedly place a significant financial burden on families of stroke patients, especially those with a lower economic level. Nowadays, there are drugs and rehabilitation interventions for stroke treatment, huge amounts of research point out that drugs for stroke are generally expensive and tend to have adverse effects such as hemorrhagic complications, thrombocytopenia, allergies, acute kidney injury, hepatic impairment and so on [3]. On the other hand, rehabilitation intervention requires patients to visit the hospital and rehab facility to find professional rehabilitation therapists to perform functional training regularly. However, many patients tend to give up because of the inconvenience of travelling. Therefore, there is an urgent need to explore an intervention that is cost-effective and allows patients to perform it at home.

The General Administration of Sport of China's Qigong Center issued the Announcement on the Catalogue of Fitness Qigong Promotion Exercises. In the announcement, the 11 types of gong methods, including Fitness Qigong-Baduanjin, Fitness Qigong-Wuqinxi, and Fitness Qigong-Liuzijue, are collectively referred to as Fitness Qigong [4]. Fitness Qigong, as a kind of national traditional sports for the purpose of promoting physical and mental health, combining physical activity, breathing and mental regulation in a quiet state to tap the potential of life and cultivate one's character, is an important part of the long-lasting culture of China. Nowadays, there are plenty of research have shown that Chinese Fitness Qigong is of great help to stroke rehabilitation. Some studies have shown that Fitness Qigong can significantly improve motor and non-motor function in stroke patients. These include cardiopulmonary function, motor function, cognitive function, emotional state, and the ability to live daily [5]. For example, stroke patients' upper limb motor function and cardiopulmonary function can be improved by practicing Baduanjin [6]; practicing Wuqinxi can enhance motor function and independence of stroke patients [7]. Therefore, this paper will discuss in detail the mechanism

of Fitness Qigong on improving stroke patients and its intervention effect.

This paper summarizes the effects of Qigong intervention on stroke, including cardiopulmonary function, motor function and non-motor function, and the exercise prescription was put forward. This paper hope to provide a reference and guidance for stroke rehabilitation. For this purpose,this paper will start from the mechanism,effect, and exercise prescription.

2. Cardiopulmonary Function in stroke patients is influenced by Fitness Qigong

Cardiorespiratory fitness generally represents cardiorespiratory health or cardiovascular disease risk, and cardiopulmonary function measures usually comprise body mass index, breathing function, blood lipids, heart rate, ejection fraction, blood pressure, and walking distance for six minutes [8]. Stroke patients with hemiplegia are sedentary and lack aerobic exercise, which often leads to a gradual decline in cardiopulmonary function and physical strength [9]. Fitness Qigong, as a fitness method that focuses on breath control combined with aerobic movement training, serves as a vital role in the enhancement of stroke patients' cardiopulmonary function. There is literature that draws conclusions by summarizing previous studies: Fitness Qigong can reduce blood pressure, slow heart rate, and increase walking distance to some extent, biomarkers of heart health have also been shown to improve in Fitness Qigong [10]. Simultaneously, research have shown that, in Fitness Qigong, Fitness Qigong-Liuzijue plays a positive role in promoting the breathing and exercise ability, and can steadily Improving lung function, dyspnea symptoms, exercise tolerance and life quality in patients with chronic diseases [10]. A study was conducted by selecting patients with post-stroke balance disorders and cardiorespiratory dysfunction,adopting experimental control method, the observation group selected "Liuzijue" respiratory function training combined with routine operation treatment intervention, and it was found that the "Six Character Technique" respiratory training combined with the conventional occupational therapy intervention could enhance stroke patients' cardiopulmonary and balance conditions [11]. Some studies have selected patients with ischemic stroke as experimental subjects, the implementation of Qigong Chi formula to intervene,the results revealed that gas function improved significantly in ischemic stroke patients in terms of stroke output per beat (SV), ejection fraction (EF), short-axis shortening (FS), and cardiac index (CI) compared to controls. However, the improvements in the blood pressure of stroke patients are not obvious [12]. In addition, there is plenty of clinical evidence show that Fitness Qigong can raise the skin temperature on the surface of the pericardial meridian and enhance the flow of qi and blood through the pericardial meridian, thus improving heart function [13].

Table 1. The effect of Fitness Qigong on cardiopulmonary function [14-19]. ↑: Increasing; ↓: Decreasing;→: Remaining unchanged.

Fitness Qigong types	BP	HT	Six minutes' walk	EF	Breathing difficulties	AT	PEF, FEC, FEV1	VO2 peak	BMI
Baduanjin	↓	↑	↑	↑	↓	↑	↑	↑	→
YiJinJing	↓	/	↑	↑	↓	↑	↑	↑	↓
Twelveduanjin	↓	↑	↑	↑	/	↑	↑	↑	/
Tai Chi health stick	↓	/	↑	↑	↓	↑	↑	↑	↓
Wuqinxi	↓	/	↑	↑	/	/	/	↑	/
Guide the twelve methods of health maintenance	↓	/	↑	/	/	/	/	/	/

The Table1 summarizes the influences of various kinds of Fitness Qigong on cardiac function indicators. It can be concluded that Fitness Qigong can play a role in reducing dyspnea, lengthening walking distance, enhancing heart rate, lung function, etc., which is conductive to the improvement of cardiopulmonary functions. However, there is no significant antihypertensive effect on blood pressure, which may be related to the small effect of practicing time on blood pressure and pulse.

3. Motor Function in Stroke Patients is influenced by Fitness Qigong

The incidence of stroke usually leads to brain nerve injury, which leaves many sequelae, among which a common

hemiplegic sequela is lower limb motor dysfunction. Lower limb motor dysfunction often leads to the loss of the patient's ability to live independently, bringing a heavy burden to the patient's body, mind, and life. Therefore, the improvement of motor ability is one of the centre purposes of stroke rehabilitation. Park M et al. study to measure walking ability by applying TUG, PPB, gait analysis and walking test,and the results demonstrated that TCQ can effectively improve stroke patients' mobility, including walking ability, homeostasis, and ADL, regardless the length of time [20]. Yuen M et al. showed that as an alternative to conventional fitness training, fitness Qigong helped chronic stroke patients with their mobility, balance, and strength in their leg muscles. 19 randomized controlled trials enrolled a total of 1,487 stroke patients, and the final comprehensive results showed that Qigong exercise greatly promoted balance function, limb motor function and walking function [21]. A meta-analysis involving 2,107 participants and 30 related studies examined how three distinct mind-body exercise programs—yoga, Qigong, and tai chi—affect stroke patients' quality of life, mental health, and physical fitness. The results show that these three physical and mental exercises can significantly improve patients' quality of life. A network meta-analysis suggests that Qigong can effectively improve post-stroke patients' balance and life quality compared to Tai Chi [22]. These findings demonstrate that the improvement of physical and psychosocial outcomes in stroke patients is inseparable from active qigong exercise.

Based on the Table 2, it can be concluded that Fitness Qigong plays a positive role in improving the balance, flexibility, muscle strength, coordination, and flexibility of stroke patients. Fitness Qigong-Baduanjin did not improve balance significantly, which may be because the patient was sedentary for a long period of time to perform the exercise, which intervened to a lesser extent in the lower limbs. Currently, few studies focus on the impacts of Fitness Qigong or tai chi on hemiplegic stroke patients. However, through longitudinal observation, it can also be inferred that it can improve stroke patients' motor function, and further studies are needed to follow up to prove this conclusion. Overall, however, Fitness Qigong is a safe, effective means of restoring balance function in patients recovering from stroke.

Table 2. The effect of Fitness Qigong on motor function [23-28]. ↑: Increasing; ↓: Decreasing;→: Remaining unchanged.

Fitness Qigong types	Balance	Pliability	Muscle strength	Coordination	Flexibility
Baduanjin	→	↑	↑	↑	↑
YiJinJing	↑	↑	↑	↑	↑
Twelveduanjin	↑	/	↑	↑	↑
Tai Chi health stick	↑	/	↑	↑	↑
Wuqinxi	↑	↑	↑	↑	↑
Guide the twelve methods of health maintenance	↑	↑	↑	/	↑

4. Non-motor Function in Stroke Patients is influenced by Fitness Qigong

Non-motor dysfunction includes sleep disturbance, cognitive decline, depression, etc. The following two areas demonstrate how Fitness Qigong helps stroke patients' non-motor functions.

For one thing, Qigong helps with mood and stress management. Several clinical research, such as meta-analyses and randomized controlled trials, have illustrated that Fitness Qigong can reduce symptoms of anxiety and depression and thus have an active effect on mental health [29]. Fitness Qigong by concentrating attention on receptors connected to the breath or other body parts, Qigong improves non-reactivity to unpleasant thoughts and impulses [29]. Studies have shown that Fitness Qigong changes the autonomic nervous system, restores homeostasis, and relieves stress associated with hypothalamic-pituitary-adrenal axis reactivity through slow movement and reduced respiratory rate, regulate the autonomic nerve system's equilibrium, and make it develop in the direction of parasympathetic nerve dominance [30]. It has been hypothesized that Qigong may regulate mood via altering the expression of genes connected to pathways and inflammatory responses during stress, or by modifying the striatum, the limbic system, and many prefrontal areas It has also been suggested that Fitness Qigong-Yijinjing can eliminate anxiety and tension in patients by reducing

sympathetic nerve activity and inhibiting the secretion of vasoconstriction hormones such as adrenaline.

On the other hand, regular qigong exercises can enhance the strength of certain muscles in stroke patients, thus improving their ability to take care of themselves. One of the main causes of impaired motor function, including impaired balance, happens when muscle strength is reduced in stroke patients. Yang Hui Xin et al. selected 30 stroke patients for 8 weeks of qigong intervention and found that Stroke patients' balance can be effectively improved by qigong exercises. Studies have shown that Fitness Qigong-Yijinjing can exercise joint control and muscle coordination.

5. Conclusion

In this review, the paper concludes that Fitness Qigong influences cardiopulmonary function, motor function and non-motor function of stroke patients positively, and its safety is high. Among them, the preparation type in the Fitness Qigong-Tai Chi health stick is a typical relaxation action, which can play a role in concentrating the mind and stabilizing the mind. Fitness Qigong - Yijinjing can play a role in being able to move the tendons and bones completely before a workout to avoid injuries. Fitness Qigong Liu Zi Di improves cardiorespiratory function of stroke patients by improving their exercise endurance. Fitness Qigong-Baduanjin can effectively improve the flexibility and muscle strength of the upper limbs. Fitness Qigong and Fitness Qigong-Wuqinxi can improve squatting and hip flexion mode, improve lower limb joint mobility, thus improving abnormal gait and improving muscle strength level. Therefore, in summary, the paper recommends stroke patients with hemiplegia to carry out a 12-week fitness qigong exercise, which combines Fitness Qigong-Tai Chi health stick, Fitness Qigong-Yijinjing, Fitness Qigong-six-character formula, Fitness Qigong-Baduanjin, Fitness Qigong-Wuqinxi as a group of training, 3 groups a day, one group in the morning, middle and evening. Overall Fitness Qigong is easy to operate, inexpensive, effective, and more acceptable to hemiplegic stroke patients, and its promotion in the community and families will have great prospects for development.

References

[1] Park M, Song R, Ju K, et al. Effects of Tai Chi and Qigong on the mobility of stroke survivors: A systematic review and meta-analysis of randomized trials. PloS one, 2022, 17(11):e0277541.

[2] Chen Zhimin, Cheng Mingweng, Gao Honglan. Study of Prevalence of Stroke and its Influencing Factors in the Middle-aged and Elderly Population. Jiangsu Health Management, 2023, 09: 1292-1296.

[3] Ruan JJ, Wei X, Kong YF, et al. Clinical observation of therapeutic effect of scalp acupuncture with long time needle retention rehabilitation on cognitive impairment after ischemic stroke. Information on TCM,2024:1-5

[4] Song Jingmin, Huang Mingfa, Chen Jun, et al. Construction and Operation of the Characteristic Teaching System of University Sports Based on Traditional Chinese Sports. Contemporary Sports Technology, 2023, (22): 127-132.

[5] Hu XZ, Zhou M, Weng JH. Eight Trigrams Boxing Combined with Wenyang Huoxue Recipe Improves Cardiopulmonary Motor Function and the Quality of Life of Patients with Coronary Heart Disease. International journal of general medicine, (2021), 14: 7557–7566.

[6] Zhang Fenglin, Shu Hongyan, Ren Leilei, et al. Study on efficacy of modified Wuqinxi on gait and balance dysfunction in elderly stroke patients and on brain mechanism based on fMRI. Journal of practical medicine, 2023, 39(09):1174-1178.

[7] Lan Y, You Q, Jiang Q, et al. Effect of Qigong exercise on non-motor function and life quality in stroke patients: A systematic review and meta-analysis. Brain Behav, 2023, 13(11): e3246.

[8] English C, Healy GN, Coates A, et al. Sitting and Activity Time in People with Stroke. Phys Ther, 2016, 96(2): 193-201.

[9] Moncion K, Biasin L, Jagroop D, et al. Barriers and facilitators to aerobic exercise implementation in stroke rehabilitation: ascoping review. JNeurolPhysTher, 2020, 44(3): 179-187.

[10] Xu S, Zhang D, He Q, et al. Efficacy of Liuzijue Qigong in patients with chronic obstructive pulmonary disease: A systematic review and meta-analysis. Complement Ther Med, 2022, 65:102809.

[11] Li H, Li G, Liu G, Zhang Y. Liuzijue Qigong vs traditional breathing training for patients with post-stroke dysarthria complicated with abnormal respiratory control: study protocol of a single center randomized controlled trial. Trials, 2018, 19(1): 335.

[12] Zou L, SasaKi JE, Wang H, et al. A Systematic Review and Meta-Analysis Baduanjin Qigong for Health Benefits: Randomized Controlled Trials. Evid Based Complement Alternat Med, 2017, 2017: 4548706.

[13] Tang Zhenhua, Lin Yufeng, Yang Lin, et al. A preliminary study on the effect of Qigong feedback on skin temperature improvement. PLA Journal of Preventive Medicine, 1994, (04): 303-304.

[14] Wan Yun. Effects of Baduanjin combined with Wuxing music therapy on lung function and quality of life in stable chronic obstructive pulmonary disease patients. Hei long jiang Medicine Journa, 2024, 37(01): 226-228.

[15] Chen Junwen, Chen Qian, Chen Cheng, et al. Effect of modified Baduanjin exercise on cardiopulmonary function, motor function and activities of daily living for stroke patients. Medicine and health technology, 2024, 30(01): 74-80.

[16] Chen Yuxiao, Zhang Linlin, Li Linlin, et al. Application of Yijin Jing in Rehabilitation of Cerebral Apoplexy. Shandong Journal of Traditional Chinese Medicine, 2021, 40(06): 654-657.
[17] Jiang Jiahui, Bi Hongyan. Influence of fitness qigong Yijinjing on fatigue and quality of life in patients with Parkinson's disease. Nursing Research, 2023, 37(24): 4452-4457.
[18] Xue Ying, Chen Zhou Yan, Zhao Baixiao. Research progress of traditional Chinese medicine therapy for essential hypertension. Proceedings of the Sixth Second Congress and Twentieth Annual Conference of the Chinese Medical Qigong Society, 2022: 5.
[19] Chen Zhichang. Study on the influence of Taiji health stick exercise on the quality of life of patients with type 2 diabetes mellitus complicated with hypertension. Beijing Sport University, 2016.
[20] Song R, Grabowska W, Park M, et al. The impact of Tai Chi and Qigong mind-body exercises on. motor and non-motor function and quality of life in Parkinson's disease: A systematic review and meta-analysis. Parkinsonism Relat Disord, 2017, 41: 3-13.
[21] Lan Y, You Q, Jiang Q, Peng X, et al. Effect of Qigong exercise on non-motor function and life quality in stroke patients: A systematic review and meta-analysis. Brain Behav, 2023, 13(11): e3246.
[22] García-Muñoz C, González-García P, Casuso-Holgado MJ, Martínez-Calderón J, Heredia-Rizo AM. Are movement-based mindful exercises (QIGONG, TAI CHI, AND YOGA) beneficial for stroke and Parkinson's disease? A scoping review. Complement Ther Med, 2023, 72:102912.
[23] Wang Yizhi, Wen Qingxiu, Li Xiuxia. Effect of Baduanjin exercise prescription on balance function in convalescent stroke patients. Shenzhen traditional Chinese and Western medicine mixed, 2023, 33(22):131-133.
[24] Xue X, Jin XM, Luo KL, et al. Effectiveness of Yijinjing on cognitive functions in post-stroke patients with mild cognitive impairment: study protocol for a randomized controlled trial. Trials, 2021, 22(1): 265.
[25] Hong Haoran, Sun Xia, Wang Xiaoli. Effect of Twelve-Duan Jin combined with aerobic training on senile stroke convalescent patients. Clinical journal of Practical Hospital, 2022, 19(05):134-137.
[26] Wang Rundong. Study on improvement of physical and mental health effect of 14-week five elements Tai Chi health exercise in elderly women. Beijing Sport University, 2020.
[27] Jia Hui. Influence of motion-sensing games combined with Wuqin training on mental state, limb motor function and quality of life of patients with cerebral infarction. Chinese and foreign medical research, 2023, 21(14):123-127.
[28] Liang Rui. Study on the intervention effect of 12 methods of Guiding Shengsheng Gong on physical and mental health of special female college students. Northeast Normal University, 2022.
[29] Lan Y, You Q, Jiang Q, et al. Effect of Qigong exercise on non-motor function and life quality in stroke patients: A systematic review and meta-analysis. Brain Behav, 2023, 13(11): e3246.
[30] Yeung A, Chan JSM, Cheung JC, et al. Qigong and Tai-Chi for Mood Regulation. Focus, 2018, 16(1): 40-47.