

Research Article

Effects of Practicing Baduanjin on Cognitive Function and the Traditional Chinese Medicine Constitution for Mild Cognitive Impairment

Ziqiu He¹, Xiaoyu Wu^{1*}, Ichiro Akiguchi², Teruaki Kawasaki² and Masanori Hosokawa¹

¹Kyoto Koka Women's University, Japan

²Kyoto Clinical and Translational Research Center for Neurocognitive Disorders, Japan

Abstract

This study investigated changes in cognitive function and Traditional Chinese Medicine Constitution (TCMC) over 3 months among 30 individuals with Mild Cognitive Impairment (MCI). The participants were divided into an intervention group practicing Baduanjin and a control group. Before the intervention, biased constitution was more prevalent than balanced constitution, with a notable prevalence of yang-deficiency constitution (40.7%), blood stasis constitution (33.3%), and yin-deficiency constitution (29.6%). Following the Baduanjin intervention, participants' overall cognitive function improved, as shown by the increased proportion of balanced constitution and the decrease in both "constipation symptoms" in yin-deficiency constitution. Additionally, the scores for blood stasis constitution decreased. Therefore, Baduanjin intervention may contribute to the improvement of the TCMC and cognitive function. The transition to and the improvement of a balanced constitution are potentially associated with cognitive function enhancement.

Keywords: Baduanjin; Mild Cognition Impaired (MCI); Traditional Chinese Medicine Constitution (TCMC)

Background

With the increasing geriatric population, the number of dementia cases has surged, becoming a major cause of caregiving. By 2030, it

*Corresponding author: Xiaoyu Wu, Kyoto Koka Women's University, Japan, E-mail: s-u@mail.koka.ac.jp

Citation: He Z, Wu X, Akiguchi I, Kawasaki T, Hosokawa M (2024) Effects of Practicing Baduanjin on Cognitive Function and the Traditional Chinese Medicine Constitution for Mild Cognitive Impairment. *J Altern Complement Integr Med* 10: 477.

Received: March 14, 2024; **Accepted:** March 26, 2024; **Published:** April 02, 2024

Copyright: © 2024 He Z, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

is predicted to be a significant issue [1]. Alzheimer's disease, which results from a complex interplay of genetics and environment, is irreversible in progression. Mild Cognitive Impairment (MCI) indicates an early stage of dementia, necessitating early intervention [2]. However, treatment options are limited, with concerns regarding economic costs, safety, and effectiveness persist.

Approaches to cognitive decline differ between traditional Chinese medicine (TCM) and Western medicine. TCM emphasizes the correlation between constitution and cognitive decline. The Chinese Medicine Association classifies constitution into nine types; thus, improving the constitution may contribute to preventing cognitive decline [3]. The practice of Baduanjin, a form of traditional Chinese exercise, may alter the TCM Constitution (TCMC) [4].

Baduanjin, which is a low-intensity aerobic exercise, is considered suitable for older adults [5]. While Baduanjin has a positive effect on cognitive function [6], research concerning its influence on TCMC remains scarce, highlighting the need for further investigation. Therefore, this study aimed to elucidate the changes in TCMC and cognitive function before and after Baduanjin practice and to explore their interrelationship in individuals with MCI.

Methods

Data sources

This study enrolled 30 residents from eight assisted living facilities operated by the same company. Participants were selected according to specific criteria, with the approval of their primary physicians and consent from the residents and their families. Inclusion criteria were as follows: 1) Mini-Mental State Examination (MMSE) scores of 24–27; 2) age 65 years or older; 3) no hearing or visual impairments, proficient in Japanese for effective communication; 4) no history and family history of psychiatric disorders; and 5) understanding of the research cooperation details and willingness to participate. Conversely, the exclusion criteria were the following: 1) severe conditions such as heart, liver, and kidney diseases, where the primary physician deemed Baduanjin implementation inappropriate; and 2) poorly controlled blood pressure, constantly having systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg. Fifteen participants from four of the eight facilities constituted the intervention group practicing Baduanjin, whereas the remaining 15 from the four other facilities formed the control group. In the intervention group, two participants dropped out because of hospitalization caused by worsening underlying conditions and Baduanjin implementation cessation following COVID-19 infection. In the control group, one participant dropped out because of hospitalization related to COVID-19. The study concluded with 27 cooperating participants. The MMSE scores, 21-item Dementia Assessment Sheet for Community-based Integrated Care System (DASC-21) scores, and TCMC assessments were evaluated at baseline and after 3 months. Data were analyzed using IBM SPSS Statistics 28. Baseline data for sex, age, exercise habits, education level, MMSE scores, DASC-21 scores, and TCMC were statistically comparable between the intervention and control groups ($p > 0.05$).

Study design

This study used a quasirandomized comparative trial study design. The control group received conventional treatment, whereas the intervention group, led by a nurse trained in Baduanjin, underwent Baduanjin training. The nurse provided guidance to patients by using the “Health Qigong Baduanjin” digital video disc (DVD; Japan Health Development Corporation), distributing DVDs and other related educational materials to facilitate learning. Baduanjin consists of eight movements: 1) supporting the heavens with both hands to regulate the three visceral cavities housing the internal organs, 2) drawing a bow to each side, resembling shooting an eagle, 3) holding up a single hand to regulate the spleen and the stomach, 4) looking backward, relieving exhaustion, 5) shaking the head and wagging the hip to remove excess heat from the heart, 6) touching the feet with both hands to be rid of the heart illness, 7) clenching fists and glaring to increase physical strength, and 8) shaking the body to ward off all illnesses.

Before the study began, nurses provided Baduanjin training to the participants for over 2 weeks. Evaluation on the final day determined the participants’ eligibility, and those who passed were officially included in the study. During the intervention period, participants engaged in Baduanjin for 30 minutes per session, 5 times a week, guided by the nurse using instructional videos. The exercise period spanned 12 weeks, during which other sports activities were suspended.

Criteria for assessment

Cognitive function assessment: Cognitive function was evaluated using the MMSE and DASC-21. The researchers completed the foundational course on dementia assessment with the DASC-21 and received certification upon completion. The MMSE has 11 items with a maximum score of 30 points; the higher the score, the higher the cognitive function. The DASC-21 consists of 21 items with a maximum score of 84 points; the higher the score, the lower the cognitive function [7,8].

TCMC assessment: The TCMC was categorized into balanced constitution and eight types of suboptimal constitutions according to the “TCMC Classification and Judgment Table” [9]. Higher scores indicate a clearer constitution. Balanced constitution is scored 60 points or higher, whereas other constitutions are scored less than 30 points. A tendency toward a balanced constitution is designated when the balanced constitution score is 60 points or higher and the scores for other constitutions are 30–40 points. A score of 60 points or higher in balanced constitution, along with any of the eight other balanced constitutions scoring 40 points or more, indicates a balanced constitution. If the balanced constitution score is less than 60 points and the scores for other biased constitutions are 30–40 points, a tendency toward a biased constitution is suggested. In this study, a tendency toward a balanced constitution was considered equivalent to a balanced constitution; likewise, a tendency toward a biased constitution was treated as a biased constitution. Additionally, we observed cases where biased constitutions coexisted under specified conditions.

Results

Among older adults with MCI, 29.6% had a balanced constitution, whereas 70.4% had a biased constitution (Tables 1 & 2). Thus, biased constitution was significantly more prevalent than balanced constitution ($p < 0.05$). Regarding the distribution of biased constitutions among older adults with MCI, including cases where biased constitution coexisted, the order of prevalence was as follows: yang-deficiency constitution (40.7%), blood stasis constitution (33.3%), and yin-deficiency constitution (29.6%).

TCMC Types	Number of participants (n)	Percentage (%)	χ^2	P
balanced constitution	8	29.6%	4.48	0.03
Biased Constitution	19	70.4%		

Table 1: Distribution of balanced constitution and Biased Constitution in the Entire Study Population (n=27).

TCMC type	All (n = 27)	
balanced constitution	8	29.6%
yang-deficiency constitution	11	40.7%
qi-deficiency constitution	5	18.5%
yin-deficiency constitution	8	29.6%
phlegm-dampness constitution	5	18.5%
dampness-heat constitution	3	11.1%
blood stasis constitution	9	33.3%
qi stagnation constitution	3	11.1%
inherited special constitution	2	7.4%
The analysis included cases with coexisting biased constitutions.		

Table 2: Number of individuals corresponding to each TCMC type (n=27).

As shown in table 3, higher scores in the phlegm–dampness constitution were associated with lower DASC-21 scores. Additionally, higher scores in the dampness–heat constitution and blood stasis constitution correlated with higher DASC-21 scores ($p < 0.05$).

TCMC type	Unstandardized coefficients		P	B's 95.0% confidence interval	
	B	Standard Error		Lower Limit	Upper Limit
balanced constitution	−0.14	0.08	0.12	−0.20	0.02
yang-deficiency constitution	0.02	0.07	0.75	−0.03	0.13
qi-deficiency constitution	−0.14	0.07	0.07	−0.17	0.08
yin-deficiency constitution	−0.10	0.09	0.27	−0.09	0.14
phlegm-dampness constitution	−0.31	0.08	0.00	−0.28	−0.02
dampness-heat constitution	0.38	0.12	0.01	0.06	0.41
blood stasis constitution	0.18	0.07	0.02	0.01	0.19
qi stagnation constitution	−0.09	0.08	0.29	−0.18	0.04
inherited special constitution	−0.03	0.08	0.73	−0.14	0.10
Dependent variable: DASC-21 scores before intervention.					

Table 3: Regression analysis of each constitution type and DASC-21 scores before intervention (n = 27).

After Baduanjin implementation, the intervention group exhibited improvements in the total MMSE score and the scores for “time orientation” and “delayed recall” compared with the control group ($p < 0.05$). Conversely, the DASC-21 total score decreased, as well as the scores for recent memory, orientation, problem-solving, instrumental activities of daily living (IADL) outside the home, and IADL inside the home ($p < 0.05$) (Tables 4 & 5).

Evaluation Items	Intervention Group(n=13)		Control Group(n=14)		M-Whitney	
	Average Rank	Sum of Ranks	Average Rank	Sum of Ranks	z	p
Orientation to Time	17.46	227.00	10.79	151.00	-2.36	0.02
Orientation to Place	16.31	212.00	11.86	166.00	-1.64	0.10
Immediate Recall	13.46	175.00	14.50	203.00	-1.04	0.30
Calculation	13.85	180.00	14.14	198.00	-0.10	0.92
Delayed Recall	18.00	234.00	10.29	144.00	-2.71	0.01
Naming of Objects	14.00	182.00	14.00	196.00	0.00	1.00
Repetition of Sentences	14.00	182.00	14.00	196.00	0.00	1.00
Verbal Instructions	14.00	182.00	14.00	196.00	0.00	1.00
Written Instructions	13.46	175.00	14.50	203.00	-1.04	0.30
Spontaneous Writing	14.88	193.50	13.18	184.50	-0.71	0.48
Copying of Figures	13.92	181.00	14.07	197.00	-0.08	0.94
Total MMSE Score	18.50	240.50	9.82	137.50	-2.88	0.00

Table 4: Comparison of MMSE Scores between Intervention Group and Control Group after the Intervention.

Evaluation Items	Intervention Group(n=13)		Control Group(n=14)		M-Whitney	
	Average Rank	Sum of Ranks	Average Rank	Sum of Ranks	z	p
1)Do you sometimes forget where you placed things such as your wallet or keys?	14.00	182.00	14.00	196.00	0.00	1.00
2)Do you have difficulty recalling a conversation or information from the past five minutes?	11.00	143.00	16.79	235.00	-2.62	0.01
3)Do you ever forget your own date of birth?	14.00	182.00	14.00	196.00	0.00	1.00
4)Are there times when you don't know the current month or date?	10.96	142.50	16.82	235.50	-2.04	0.04
5)Have you experienced not knowing where you are?	10.50	136.50	17.25	241.50	-2.68	0.01
6)Have you ever gotten lost and couldn't find your way home?	10.58	137.50	17.18	240.50	-2.30	0.02
7)Can you effectively handle situations when the electricity, gas, or water is cut off?	9.92	129.00	17.79	249.00	-2.87	0.00
8)Are you able to plan your day on your own?	13.50	175.50	14.46	202.50	-0.38	0.70
9)Can you choose clothing appropriate for the season or situation?	13.50	175.50	14.46	202.50	-0.96	0.34
10)Are you capable of shopping on your own?	9.92	129.00	17.79	249.00	-2.80	0.01
11)Can you travel alone using buses, trains, or your own vehicle?	10.19	132.50	17.54	245.50	-2.67	0.01
12)Are you able to manage financial transactions like withdrawing money, paying rent, or utility bills on your own?	11.50	149.50	16.32	228.50	-1.92	0.06
13)Can you make phone calls?	14.04	182.50	13.96	195.50	-0.05	0.96
14)Can you prepare meals for yourself?	10.46	136.00	17.29	242.00	-2.61	0.01
15)Can you take medication at prescribed times and in the correct doses on your own?	11.65	151.50	16.18	226.50	-1.93	0.05
16)Can you bathe independently?	14.00	182.00	14.00	196.00	0.00	1.00
17)Can you change clothes on your own?	14.00	182.00	14.00	196.00	0.00	1.00
18)Can you use the toilet independently?	14.00	182.00	14.00	196.00	0.00	1.00
19)Can you groom yourself independently?	14.00	182.00	14.00	196.00	0.00	1.00
20)Can you have a meal on your own?	14.00	182.00	14.00	196.00	0.00	1.00
21)Can you move around inside your home independently?	14.00	182.00	14.00	196.00	0.00	1.00
DASC-21 Total Score	9.04	117.50	18.61	260.50	-3.14	0.00

Table 5: Comparison of DASC-21 Scores between Intervention and Control Groups after Intervention.

Furthermore, the proportion of balanced constitution increased after Baduanjin implementation, while the “constipation symptoms” item for yin-deficiency constitution and the scores for blood stasis constitution decreased ($p < 0.05$) (Tables 6 & 7).

TCMC type	Before Intervention(n=13)		After Intervention(n=13)		χ^2	P
	Count	Percentage	Count	Percentage		
balanced constitution	3	23.10%	9	69.20%	5.57	0.02
yang-deficiency constitution	7	53.80%	3	23.10%	2.60	0.11
qi-deficiency constitution	3	23.10%	2	15.40%	0.25	0.62
yin-deficiency constitution	4	30.80%	2	15.40%	0.87	0.35
phlegm-dampness constitution	4	30.80%	3	23.10%	0.20	0.66
dampness-heat constitution	2	15.40%	0	0%	2.17	0.14
blood stasis constitution	4	30.80%	1	7.70%	2.23	0.14
qi stagnation constitution	2	15.40%	1	7.70%	3.38	0.55
inherited special constitution	1	7.70%	1	7.70%	0.00	1

Table 6: Cross-tabulation table of the number of individuals fitting each TCMC type before and after intervention in the intervention group (Chi-square test).

The questionnaire contains some duplicate items. However, items 3, 4, 5, 6, 7, and 8 are reversed items within the balanced constitution category. Therefore, for reversed items, the scores were reversed for analysis.

Discussion

TCMC distribution

The analysis of TCMC among older adults with MCI revealed that biased constitution (70.0%) had a significantly higher prevalence than balanced constitution (29.6%), with yang-deficiency constitution (40.7%) being the most prevalent within the biased constitution category. This finding aligns with extensive research on TCMC conducted in China and indicates that individuals with MCI are inclined toward a biased constitution compared with those with normal cognitive function [10].

Yan et al., reported that among the biased constitution categories, qi-deficiency constitution had the highest distribution in the MCI group, followed by yang-deficiency constitution, and phlegm-dampness constitution. Their research further indicates that individuals aged 80 years or below with MCI predominantly exhibit qi-deficiency constitution, whereas those aged 80 years or above primarily manifest yang-deficiency constitution [11]. Given that the mean age of our participants was 80 years or above, the higher prevalence of yang-deficiency constitution can be attributed to aging-related deficiencies in the postnatal heart, spleen, and kidney energies, leading to insufficient positive energy in the five zang organs and ultimately, resulting in yang-deficiency constitution. Moreover, the change in TCMC is dynamic. This characteristic is influenced by both congenital genetic and acquired factors, including lifestyle and dietary habits, thereby related to changes in internal and external environments.

Wei et al., investigated the correlation between sleep, dietary habits, and TCMC and found that individuals who frequently consume cold foods are more likely to develop a yang-deficiency constitution; additionally, those with a diet rich in meat, high salt content, and

intense flavors tend to exhibit a higher prevalence of phlegm-dampness constitution [12]. Hui [13] discussed the differences in dietary habits between Chinese and Japanese cultures and observed that Chinese cuisine often involves prolonged cooking techniques such as boiling, frying, pickling, frying, and baking, resulting in richer flavors. Conversely, Japanese culinary practices emphasize extracting the inherent flavors of ingredients, often favoring raw foods. Hui noted that compared with Chinese cuisine, Japanese cuisine tends to be milder in taste. Therefore, Japanese individuals are more prone to yang-deficiency constitution and less likely to have phlegm-dampness constitution compared with their Chinese counterparts.

In TCM, normal bowel movements are closely linked to the functions of the spleen, stomach, lungs, and large intestine. Stimulating the spleen, stomach, lung, and large intestine meridians can help relieve constipation symptoms. In the context of the Baduanjin intervention in the present study, the item “Prone to constipation” related to yin-deficiency constitution significantly improved, indicating that Baduanjin implementation significantly contributed to alleviating constipation symptoms. The second movement of Baduanjin, that is, “Drawing a bow to each side, resembling shooting an eagle,” involves expanding the chest and extending the arms, primarily stimulating the heart meridian and lung meridian. Meanwhile, the muscles of the thumb and index finger run along the large intestine meridian and lung meridian, which can be stimulated by contracting and extending the fingertip muscles. The third movement “Holding up a single hand to regulate the spleen and stomach” enhances spleen function and regulates the digestive functions. Furthermore, in the fifth movement, that is, “Shaking the head and wagging the hip to remove excess heat from the heart,” pelvic rotation contracts the abdominal area, pushing the diaphragm downward. This mechanism stimulates the digestive system, including the liver, gallbladder, spleen, stomach, large intestine, and small intestine, promoting metabolism and excretion [14].

Concerning the blood stasis constitution, Qi is classified into four types according to its generation and physiological functions: Zongqi, Yingqi, Weiqi, and Yuanqi. The driving force of Qi, which promotes the circulation of organ functions, blood, and body fluids, is referred to as Qi’s propelling action. Zongqi possesses this propelling action, which originates from the clear Qi in the atmosphere and the refined Qi of water and grains. It is closely related to the lungs and spleen among the five organs. Moreover, regarding the fitness effects of the first movement of Baduanjin, we found that “Supporting the heavens with both hands to regulate the three visceral cavities housing the internal organs” stimulates the three yin and three yang meridians of the hands, promoting the flow of Qi. This movement also opens the spleen and stomach meridians, thereby adjusting the Qi of the liver, gallbladder, heart, and lungs. It regulates the heart, lung, and liver functions and assists in the overall circulation of Qi and blood. The second movement, that is, “Drawing a bow to each side, resembling shooting an eagle,” stimulates the heart and lung meridians, enhancing the heart and lung functions. As for the third movement, “Holding up a single hand to regulate the spleen and stomach” strengthens the heart, lung, and spleen functions. It increases cardiac output and lung inhalation, allowing the spleen to transport more water and grains. These effects contribute to the improvement of the blood stasis constitution.

Upon examination of the TCMC distribution after Baduanjin intervention, the number of individuals classified under the balanced constitution significantly increased, while other balanced

TCMC Assessment Items	Before Intervention		After Intervention		Wilcoxon	
	Average Rank	Sum of Ranks	Average Rank	Sum of Ranks	z	p
balanced constitution	6.88	27.50	7.06	63.50	-1.26	0.21
1.Were you energetic?	5.13	20.50	5.75	34.50	-0.73	0.46
2.Can you adapt to changes in the external natural and social environment?	4.50	22.50	6.50	32.50	-0.54	0.59
3.Do you suffer from insomnia?	4.50	9.00	3.00	12.00	-0.32	0.75
4.Are you more vulnerable to cold (winter cold, air conditioning, fans, etc.) than others?	5.00	15.00	5.00	30.00	-0.92	0.36
5.Do you get tired easily?	5.25	10.50	4.93	34.50	-1.46	0.14
6.Is your voice quiet?	4.50	18.00	5.40	27.00	-0.58	0.56
7.Do you easily forget things?	2.50	2.50	3.13	12.50	-1.41	0.16
8. Do you feel gloomy and depressed?	5.00	20.00	4.00	16.00	-0.29	0.77
yang-deficiency constitution	7.33	44.00	5.67	34.00	-0.40	0.69
9.Do your hands or feet feel cold?	5.25	31.50	5.88	23.50	-0.43	0.67
10.Is your abdomen, back, and lower back and knees feeling cold?	3.70	18.50	2.50	2.50	-1.73	0.08
11.Are you sensitive to cold and tend to wear more clothes than others?	5.00	10.00	3.60	18.00	-0.70	0.48
12.Are you more vulnerable to cold (winter cold, air conditioning, fans, etc.) than others?	5.00	30.00	5.00	15.00	-0.92	0.36
13.Do you feel uncomfortable or avoid eating (drinking) cold things?	4.00	12.00	5.50	33.00	-1.31	0.19
14.Do you easily get diarrhea when exposed to cold or consume cold food/drink?	3.88	15.50	4.17	12.50	-0.26	0.79
15.Do you catch colds more easily than others?	6.25	25.00	4.00	20.00	-0.31	0.76
qi-deficiency constitution	8.00	48.00	5.00	30.00	-0.71	0.48
16.Do you get tired easily?	4.93	34.50	5.25	10.50	-1.46	0.14
17.Do you experience shortness of breath easily?	6.38	51.00	5.00	15.00	-1.71	0.09
18.Is your heart prone to palpitations?	4.17	12.50	3.88	15.50	-0.26	0.79
19.Do you easily get dizzy or feel lightheaded when standing up?	4.67	14.00	3.50	14.00	0.00	1.00
20.Do you catch colds more easily than others?	6.25	25.00	4.00	20.00	-0.31	0.76
21.Do you prefer quietness and dislike talking?	5.00	20.00	5.00	25.00	-0.31	0.76
22.Is your voice quiet?	5.40	27.00	4.50	18.00	-0.58	0.56
23.Do you sweat easily with a slight increase in physical activity?	3.67	11.00	3.33	10.00	-0.11	0.91
yin-deficiency constitution	8.56	68.50	4.50	22.50	-1.62	0.11
24.Are the palms of your hands and the soles of your feet warm?	6.00	12.00	4.00	24.00	-0.91	0.37
25 Does your body or face feel hot?	6.00	6.00	3.00	15.00	-1.00	0.32
26.Do your skin or lips feel dry?	2.50	2.50	2.50	7.50	-1.00	0.32
27.Are your lips redder than usual?	2.00	6.00	0.00	0.00	-1.63	0.10
28.Do you often experience constipation or dry stools?	5.61	50.50	4.50	4.50	-2.49	0.01
29.Does your face easily become flushed?	4.80	24.00	4.00	12.00	-0.91	0.37
30.Do your eyes feel dry?	4.25	25.50	2.50	2.50	-1.98	0.05
31.Do you often feel parched and have a constant desire to drink water?	5.25	21.00	5.67	34.00	-0.69	0.49
phlegm-dampness constitution	6.80	34.00	4.20	21.00	-0.67	0.51
32.Do you experience discomfort, such as a feeling of tightness in the chest or bloating in the abdomen	5.50	22.00	3.50	14.00	-0.59	0.56
33.Does your body feel heavy or lethargic?	5.13	20.50	2.50	7.50	-1.12	0.26
34.Is your stomach/belly flabby?	1.50	1.50	1.50	1.50	0.00	1.00
35. Do your face or nose feel greasy or shine?	4.25	17.00	3.67	11.00	-0.52	0.60
36.Do your upper eyelids swell compared to others?	4.40	22.00	5.75	23.00	-0.06	0.95
37.Does your mouth feel sticky?	3.63	14.50	3.25	6.50	-0.85	0.40
38. Do you usually have a lot of phlegm, especially feeling phlegm stuck in your throat?	4.90	24.50	5.13	20.50	-0.25	0.80

39. Do you have a thick coating on your tongue or a feeling of thickness on your tongue?	5.67	17.00	6.13	49.00	-1.47	0.14
dampness-heat constitution	7.30	36.50	4.92	29.50	-0.31	0.75
40. Is your entire face, especially your nose, oily?	4.00	12.00	4.00	16.00	-0.38	0.71
41. Do you easily get acne or sores?	3.00	3.00	3.00	12.00	-1.34	0.18
42. Do you have a bitter taste or a strange taste in your mouth?	4.00	16.00	2.50	5.00	-1.19	0.23
43. Is your bowel movement not clear and do you often have sticky stools?	3.17	9.50	3.83	11.50	-0.21	0.83
44. Did you feel a burning sensation in your urethral canal when you urinated, or did your urine have a dark color?	4.38	17.50	3.50	10.50	-0.63	0.53
45. Is your scrotum always wet?	2.25	4.50	1.50	1.50	-0.82	0.41
blood stasis constitution	5.78	52.00	3.00	3.00	-2.53	0.01
46. Is it easy for you to develop bruises on your skin?	3.10	15.50	5.50	5.50	-1.08	0.28
47. Can you see capillaries through your facial skin?	2.00	2.00	2.00	4.00	-0.58	0.56
48. Do you feel pain anywhere in your body?	6.17	37.00	4.50	18.00	-0.99	0.32
49. Do you have a dark complexion or easily get brown spots?	5.00	5.00	2.50	10.00	-0.69	0.49
50. Do you easily get dark circles under your eyes?	3.50	17.50	3.50	3.50	-1.63	0.10
51. Do you easily forget things?	3.13	12.50	2.50	2.50	-1.41	0.16
52. Do you have dark-colored lips?	2.50	10.00	0.00	0.00	-1.84	0.07
qi stagnation constitution	5.75	34.50	6.30	31.50	-0.13	0.89
53. Do you feel gloomy and depressed?	4.00	16.00	5.00	20.00	-0.29	0.77
54. Are you prone to nervousness and irritability?	6.50	39.00	4.00	16.00	-1.22	0.22
55. Are you sentimental and prone to tears?	5.25	21.00	4.80	24.00	-0.18	0.86
56. Are you easily scared or frightened?	5.33	16.00	3.00	12.00	-0.35	0.73
57. Do you experience distention in the underarm or breast?	4.00	12.00	3.00	9.00	-0.33	0.74
58. Do you sigh for no reason?	3.00	9.00	4.00	12.00	-0.33	0.74
59. Do you have a sensation of a foreign object in your throat?	4.00	12.00	3.00	9.00	-0.32	0.75
inherited special constitution	5.43	38.00	7.00	28.00	-0.45	0.65
60. Do you sneeze even when you don't have a cold?	3.50	7.00	3.50	14.00	-0.82	0.41
61. Do you have a runny or stuffy nose even when you don't have a cold?	4.50	22.50	4.50	13.50	-0.71	0.48
62. Do you cough due to seasonal changes, temperature variations, or unpleasant odors?	4.00	16.00	4.00	12.00	-0.38	0.71
63. Do you experience allergic reactions, such as to medications, foods, odors, pollen, or seasonal changes	1.00	1.00	0.00	0.00	-1.00	0.32
64. Do you easily develop hives or urticaria?	1.00	1.00	2.50	5.00	-1.09	0.28
65. Have you experienced purpura (purple spots, ecchymosis) on your skin due to allergies?	3.00	6.00	2.00	4.00	-0.38	0.71
66. Does your skin turn red and show scratches easily?	2.33	7.00	3.00	3.00	-0.74	0.46

Table 7: Comparison of TCMC before and after intervention in the intervention group (n=13).

constitutions showed a decreasing trend. Thus, the practice of Baduanjin may facilitate a transition from a biased constitution to a balanced constitution by enhancing organ functions, nourishing Yin, and promoting the flow of Qi and blood. However, research on TCMC improvement by Baduanjin practice is limited. Hence, further evidence is necessary to substantiate these findings.

Changes in cognitive function resulting from baduanjin

In cognitive function evaluation using the MMSE, both “delayed recall” scores and overall MMSE scores significantly improved after Baduanjin intervention. Similarly, improvements in cognitive function and activities of daily living were observed using DASC-21. Therefore, a potential link may exist between cognitive function and daily living activities [15], in which Baduanjin intervention may

facilitate these enhancements. From the perspective of TCM, the effect of the intervention on cognitive function may be related to the concept that the kidneys store essence and are closely connected to brain function [16]. Specifically, the Baduanjin movement “Touching the feet with both hands to relieve heart illness” is believed to enhance kidney function, improve deficiencies in the brain marrow, and contribute to cognitive function improvement. From a Western medicine standpoint, Baduanjin enhances functional connectivity in the brain and contributes to memory improvement [17]. Collectively, these studies suggest that Baduanjin exerts positive effects on overall brain function.

Relationship between TCMC and cognitive function

With regard to the relationship between TCMC and cognitive function, a tendency was observed wherein lower scores in the

dampness–heat constitution and blood stasis constitution correlated with higher cognitive function. The dampness–heat constitution refers to the internal presence of dampness and heat in an individual, characterized by manifestations including oily skin, bitter taste, and yellow greasy coating on the tongue. It signifies a state in which dampness and heat evils combine. The dampness–heat constitution is related to the function of the spleen, and in older adults, with the decline in the functions of the five organs, spleen function also decreases. The spleen governs transportation and distribution and conveys essential nutrients throughout the body. Dysregulation of the spleen function impedes the metabolic functions of bodily fluids, leading to the accumulation of excessive dampness, which eventually transforms into heat. The impact of damp heat on Qi and blood circulation hinders the normal functioning of the brain.

According to Chen [18], the fundamental issue in older adults is insufficient kidney essence, which can lead to kidney qi-deficiency, causing blood stagnation. This vicious cycle of blood stasis will further affect the flow of Qi and blood, contributing to the deterioration of organ functions. In the present study, Baduanjin intervention significantly improved blood stasis constitution, accompanied with cognitive function enhancement. Therefore, improving blood stasis constitution may lead to enhanced cognitive function. In addition, although not statistically significant in this study, the dampness–heat constitution improved after Baduanjin intervention. Thus, dampness–heat constitution improvement may also have a positive effect on cognitive function. However, further evidence is required to validate these findings. Moreover, the proportion of participants with a balanced constitution significantly increased after Baduanjin intervention. Zhao et al., reported a negative correlation between MCI occurrence risk and balanced constitution [19]. Overall, our study results support the potential contribution of Baduanjin intervention to TCMC improvement and consequently, cognitive function enhancement, presenting a promising avenue for improving and preventing cognitive function decline. Further investigations are needed to confirm these results with more evidence.

Implications for Nursing

In older adults with MCI, the prevalence of a biased constitution was found to be higher than that of a balanced constitution. Thus, maintaining a balanced constitution may have a high potential for preventing and improving cognitive function decline. Offering guidance on maintaining a balanced constitution to older adults is important for preventing cognitive function impairment. Particularly, given the prevalence of yang-deficiency constitution and blood stasis constitution in this population, preventing biases toward these constitutions becomes crucial. From a nursing perspective, Baduanjin implementation contributes to the transition to and improvement in balanced constitution, thereby leading to enhanced cognitive function. Baduanjin, being a gentle and versatile form of exercise, can potentially contribute to the prevention of MCI within communities.

Future Challenges

To ensure alignment with previous Chinese studies on TCMC distribution, more data concerning TCMC are needed. Conducting surveys on TCMC distribution in Japan is crucial. Additional research targeting older Japanese individuals is required, especially concerning the relationship between phlegm–dampness constitution, which yielded results inconsistent with TCM theory, and cognitive function.

Declaration of Interest

The authors declare no conflicts of interest.

Acknowledgment

The authors express their gratitude to the participants of this study and their families, as well as to the staff members of the assisted living facilities, for their collaboration in this research endeavor.

Funding

This research is supported in part by a budget of Kyoto Koka Women's University for scientific researches.

References

1. Cabinet Office (2021) Health and welfare | White Paper on Aging Society 2020. Cabinet Office, Japan.
2. Petersen RC (2000) Mild cognitive impairment: Transition between aging and Alzheimer's disease. *Neurologia* 15: 93-101.
3. Wang L, Cong L, Liu K (2022) A study on the relationship between traditional Chinese medicine Constitution types and mild cognitive impairment. *Alzheimer's Disease and Related Disorders Journal* 5: 109-118.
4. He Y, Shi H, Zhao M, Zhao L, Fan P, et al. (2015) Study on the influence of Baduanjin exercise on 36 elderly people with phlegm-dampness constitution. *Chinese Journal of Traditional Medical External Treatment* 24: 9-11.
5. Nagahama M, Tanaka M, Hasegawa R, Hagiwara H (2007) Consideration of exercise intensity during Tai Chi Baduanjin. *Journal of the Japan Society of Respiration and Rehabilitation* 17: 246-250.
6. Xie Q, Wu C, Liang Z, Li X (2020) Literature review on the impact of Baduanjin exercise on cognitive function. *Massage and Rehabilitation Medicine* 11: 28-31.
7. Folstein MF, Folstein SE, McHugh PR (1975) 'Mini-mental state'. A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research* 12: 189-198.
8. Sueta K, Sugiyama M, Ito K (2015) Internal reliability and validity of DASC-21 (dementia assessment Sheet in the community for the elderly 21 items) in a comprehensive care system for community-dwelling elderly individuals. *Japanese Journal of Geriatric Psychiatry* 26: 675-686.
9. Yanbo Z, Hideki O, Kazuo U, Fenghao X, Qi W (2008) Clinical development and validation of the Japanese version of the constitution in Chinese medicine questionnaire (CCMQ). *Journal of Japanese Society of Oriental Medicine* 59: 783-792.
10. Ziqiu H, Xiaoyu W, Masanori H (2023) The relationship between mild cognitive impairment and traditional Chinese medicine constitution in China, and intervention methods in traditional Chinese medicine – A literature review. *Journal of Research, Kyoto Koka Women's University* 60: 131-143.
11. Hua Y, Ge Y, Chunxin S, Runshun Z, Hao L (2021) Distribution and influencing factors of traditional Chinese medicine Constitution in elderly patients with mild cognitive impairment of different ages. *Modern Biomedical Progress* 21: 2853-2857.
12. Linyun W, Candon L, Wenjin H, Minglong Y, Shouqing H, et al. (2016) Correlation study on sleep and dietary habits and physical fitness constitution in Chinese medicine examination population. *Journal of Liaoning University of Traditional Chinese Medicine* 18: 121-123.
13. Zhiguang H (2016) Analysis of the differences in Chinese and Japanese dietary cultures. *Journal of Anshan Normal University* 18: 86-88.
14. Jingchun S (2022) Research on the "shaking the head and wagging the tail to remove excess heat from the heart" movement of Baduanjin. The 12th National Sports Science Congress. Abstracts – Special Reports (Wushu and Ethnic Traditional Sports Branch) 457-458.

15. Hashimoto M, Akiratsuda, Yata Y (2017) Relationship between cognitive function and ADL, QOL in elderly people living in a nursing home. *Journal of Psychology*. Kurume University 16: 31-37.
16. Xiaoyu W (2020) Natural life theory in traditional Chinese medicine nursing. Japan Nursing Association Publishing Company, Japan.
17. Moyi L (2017) Functional Imaging Study of Baduanjin Exercise Intervention for Mild Cognitive Impairment Based on Default Network. Doctoral dissertation, Fujian University of Traditional Chinese Medicine, Japan.
18. Liming C (2011) Research ideas on treating mild cognitive impairment from the perspective of kidney deficiency and blood stasis. *Yunnan Journal of Traditional Chinese Medicine and Materia Medica* 32: 12-103.
19. Lihua Z, Xiucheng N, Wei M (2017) Study on the correlation between traditional Chinese medicine constitution types and homocysteine levels in patients with mild cognitive impairment. *Guangxi Journal of Traditional Chinese Medicine* 40: 1-6.



- Advances In Industrial Biotechnology | ISSN: 2639-5665
- Advances In Microbiology Research | ISSN: 2689-694X
- Archives Of Surgery And Surgical Education | ISSN: 2689-3126
- Archives Of Urology
- Archives Of Zoological Studies | ISSN: 2640-7779
- Current Trends Medical And Biological Engineering
- International Journal Of Case Reports And Therapeutic Studies | ISSN: 2689-310X
- Journal Of Addiction & Addictive Disorders | ISSN: 2578-7276
- Journal Of Agronomy & Agricultural Science | ISSN: 2689-8292
- Journal Of AIDS Clinical Research & STDs | ISSN: 2572-7370
- Journal Of Alcoholism Drug Abuse & Substance Dependence | ISSN: 2572-9594
- Journal Of Allergy Disorders & Therapy | ISSN: 2470-749X
- Journal Of Alternative Complementary & Integrative Medicine | ISSN: 2470-7562
- Journal Of Alzheimers & Neurodegenerative Diseases | ISSN: 2572-9608
- Journal Of Anesthesia & Clinical Care | ISSN: 2378-8879
- Journal Of Angiology & Vascular Surgery | ISSN: 2572-7397
- Journal Of Animal Research & Veterinary Science | ISSN: 2639-3751
- Journal Of Aquaculture & Fisheries | ISSN: 2576-5523
- Journal Of Atmospheric & Earth Sciences | ISSN: 2689-8780
- Journal Of Biotech Research & Biochemistry
- Journal Of Brain & Neuroscience Research
- Journal Of Cancer Biology & Treatment | ISSN: 2470-7546
- Journal Of Cardiology Study & Research | ISSN: 2640-768X
- Journal Of Cell Biology & Cell Metabolism | ISSN: 2381-1943
- Journal Of Clinical Dermatology & Therapy | ISSN: 2378-8771
- Journal Of Clinical Immunology & Immunotherapy | ISSN: 2378-8844
- Journal Of Clinical Studies & Medical Case Reports | ISSN: 2378-8801
- Journal Of Community Medicine & Public Health Care | ISSN: 2381-1978
- Journal Of Cytology & Tissue Biology | ISSN: 2378-9107
- Journal Of Dairy Research & Technology | ISSN: 2688-9315
- Journal Of Dentistry Oral Health & Cosmesis | ISSN: 2473-6783
- Journal Of Diabetes & Metabolic Disorders | ISSN: 2381-201X
- Journal Of Emergency Medicine Trauma & Surgical Care | ISSN: 2378-8798
- Journal Of Environmental Science Current Research | ISSN: 2643-5020
- Journal Of Food Science & Nutrition | ISSN: 2470-1076
- Journal Of Forensic Legal & Investigative Sciences | ISSN: 2473-733X
- Journal Of Gastroenterology & Hepatology Research | ISSN: 2574-2566
- Journal Of Genetics & Genomic Sciences | ISSN: 2574-2485
- Journal Of Gerontology & Geriatric Medicine | ISSN: 2381-8662
- Journal Of Hematology Blood Transfusion & Disorders | ISSN: 2572-2999
- Journal Of Hospice & Palliative Medical Care
- Journal Of Human Endocrinology | ISSN: 2572-9640
- Journal Of Infectious & Non Infectious Diseases | ISSN: 2381-8654
- Journal Of Internal Medicine & Primary Healthcare | ISSN: 2574-2493
- Journal Of Light & Laser Current Trends
- Journal Of Medicine Study & Research | ISSN: 2639-5657
- Journal Of Modern Chemical Sciences
- Journal Of Nanotechnology Nanomedicine & Nanobiotechnology | ISSN: 2381-2044
- Journal Of Neonatology & Clinical Pediatrics | ISSN: 2378-878X
- Journal Of Nephrology & Renal Therapy | ISSN: 2473-7313
- Journal Of Non Invasive Vascular Investigation | ISSN: 2572-7400
- Journal Of Nuclear Medicine Radiology & Radiation Therapy | ISSN: 2572-7419
- Journal Of Obesity & Weight Loss | ISSN: 2473-7372
- Journal Of Ophthalmology & Clinical Research | ISSN: 2378-8887
- Journal Of Orthopedic Research & Physiotherapy | ISSN: 2381-2052
- Journal Of Otolaryngology Head & Neck Surgery | ISSN: 2573-010X
- Journal Of Pathology Clinical & Medical Research
- Journal Of Pharmacology Pharmaceutics & Pharmacovigilance | ISSN: 2639-5649
- Journal Of Physical Medicine Rehabilitation & Disabilities | ISSN: 2381-8670
- Journal Of Plant Science Current Research | ISSN: 2639-3743
- Journal Of Practical & Professional Nursing | ISSN: 2639-5681
- Journal Of Protein Research & Bioinformatics
- Journal Of Psychiatry Depression & Anxiety | ISSN: 2573-0150
- Journal Of Pulmonary Medicine & Respiratory Research | ISSN: 2573-0177
- Journal Of Reproductive Medicine Gynaecology & Obstetrics | ISSN: 2574-2574
- Journal Of Stem Cells Research Development & Therapy | ISSN: 2381-2060
- Journal Of Surgery Current Trends & Innovations | ISSN: 2578-7284
- Journal Of Toxicology Current Research | ISSN: 2639-3735
- Journal Of Translational Science And Research
- Journal Of Vaccines Research & Vaccination | ISSN: 2573-0193
- Journal Of Virology & Antivirals
- Sports Medicine And Injury Care Journal | ISSN: 2689-8829
- Trends In Anatomy & Physiology | ISSN: 2640-7752

Submit Your Manuscript: <https://www.heraldopenaccess.us/submit-manuscript>