

The Influence of Fitness Qigong (Baduanjin) on Physical Health of Female College Students with Simple Obesity

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ABSTRACT

Thirty-two female college students with simple obesity were selected via tests, questionnaires and interviews and randomly divided into the experimental group (4 times a week, 90 minutes each time) and control group (daily walking, sitting and lying without extra exercise). Meanwhile, the sleep and diet of the two groups were monitored, which was kept at the same level as before the experiment. Through the 16-week Baduanjin fitness exercise, 16 indexes, such as body shape, body function and body quality, were compared and analyzed between the two groups before and after the experiment. It was found that the 16-week Baduanjin fitness exercise can promote the physical health of obese female college students, and indicators with significant effects in body shape include BMI, upper chest circumference and waist circumference and physical function such as vital capacity, and physical quality like 50m running, 800m running and sit-ups.

Keywords: *Baduanjin, obesit, physical health*

1. INTRODUCTION

The adverse effects of obesity on people's physical and mental health have aroused widespread concern in the academic circle, with related researches being a hot spot in contemporary medical field. Obesity not only causes cardiovascular diseases and changes in appearance, but also burdens people psychologically, causing the sense of inferiority. Contemporary women, especially female college students who are young and sensitive, particularly worry about obesity. The purpose of this study is to provide theoretical basis and scientific approaches for obese female college students to improve their body shape and lose weight through scientific exercise.

Baduanjin, a traditional Chinese Qigong, features an integration of traditional culture and the theories of Yin-Yang and TCM meridian, benefiting people by cleaning the veins and arteries, eliminating diseases, strengthening health and prolonging life. This study focused on Baduanjin for overall intervention in combination with health education, psychological counseling, dietary supervision and medical supervision.

2. SUBJECTS AND METHODS OF RESEARCH

2.1 Subjects

Female volunteers from Grade 2017 students majoring in Public Physical Education were selected based on the

height and weight specified by "Standards for Students' Physical Health". Students with secondary obesity were excluded through strict medical screening, and 32 obese girls aged 18-21 were selected as subjects of research.

2.2 Methods

2.2.1 Literature review

Literature review offers a channel for people to understand the progress and depth of previous studies, test approaches and corresponding experimental results so as to provide technical support and assistance for the development of this experimental study.

2.2.2 Physical fitness test

Students with BMI greater than or equal to 28 were selected through physical fitness test, after which 32 simple obesity girls were selected by questionnaire survey and body circumference measurement before being randomly assigned to experimental group and control group, with 16 students in each group.

2.2.3 Questionnaire survey

Female college students with BMI ≥ 28 were investigated through questionnaire survey to acquire information about their physical changes, obesity of parents, family dietary habit, sleeping habit, etc. Then, 32 female college students with simple obesity were selected from them.

2.2.4 Experimental Research

The experimental group exercised for 90 minutes four times a week while the control group only participated in data measurement before and after the experiment without extra exercise. At the end of the 16-week experiment, the data of experimental group and control group was compared.

The exercises of experimental group include: warm-up, basic Wushu foot movements such as lunge, horse step and crouch stance stretching, activities of important joints such as head, shoulders, waist, hips, knees, wrists and ankles, Baduanjin Qigong, breathing exercises, etc. Practice method: Continuous training for four times a week, 90 minutes each time.

Other interventions:

(1) Diet monitoring: members of the experimental group recorded their three meals a day, and a supervisor was sent to check their daily diet irregularly. The subjects kept regular intake without changes to the amount.

(2) Health education and psychological counseling: the subjects learnt about the harm of obesity to their own health through health education so that they actively engaged in the experiment and training. They corrected bad eating habits and lifestyles, and built up confidence in weight loss.

(3) Medical supervision: regular health examination and active prevention of diseases so as not to delay the normal training while performing comprehensive medical observation and monitoring of the whole intervention.

2.2.5 Statistics

The data was analyzed by SPSS, with the results being expressed as mean±standard deviation. Statistical analysis used independent sample T-test, where $p < 0.05$ was

significant difference and $p < 0.01$ very significant difference. The study tested and analyzed whether the Baduanjin-based intervention had an impact on the experimental indicators of female college students with simple obesity.

2.3 Test indicators:

Due to the influence of experimental conditions, time and other factors, the study tested only parts of indicators involved in physical fitness for measurement and statistics, covering physical shape, function and fitness to observe changes of physical fitness and shape before and after intervention.

(1) Physical shape: height (cm), weight (cm), upper chest circumference (cm), lower chest circumference (cm), waist circumference (cm), hip circumference (cm), thigh circumference (cm), calf circumference (cm), upper arm circumference (cm), lower arm circumference (cm);

(2) Physical function: vital capacity (ml);

(3) Physical fitness: forward bends (cm), sit-ups (per minute), standing long jump (cm), 800m run (s), 50m run (s).

3. RESULT AND ANALYSIS

3.1 Physical changes before and after intervention

Table 1 Physical Changes Before and After Intervention in Experimental Group N=16

Item	Before Intervention	After Intervention	T value	P value
Upper Chest Circumference (cm)	108.4±6.835	106.5±6.549	3.604	0.003
Lower Chest Circumference (cm)	94.2±7.0922	94.1±5.672	0.140	0.890
Upper Arm Circumference (cm)	34.1±2.967	33.4±2.618	1.080	0.297
Lower Arm Circumference (cm)	25.8±2.173	25.0±2.109	1.815	0.090
Waist Circumference (cm)	97.8±8.968	96.4±7.867	1.446	0.169
Hip Circumference (cm)	108.9±7.768	108.5±7.788	0.760	0.459
Thigh Circumference (cm)	62.5±4.317	64.2±4.793	-2.959	0.010
Calf Circumference (cm)	41.7±3.202	41.6±2.677	0.283	0.781
Height (cm)	160.4±6.341	160.4±6.496	-1.464	0.164
Weight (kg)	84.9±9.563	82.1±8.050	2.432	0.028

The statistical results showed that the Baduanjin-based intervention led to some physical changes of the subjects before and after the experiment. As far as the data is concerned, the height P was greater than 0.05, with no significant difference. As to the average value before and after intervention, the indicator of body weight was smaller than that before intervention. Statistically, the difference is significant when the P value is less than 0.05. As to body

circumference, the P value was 0.003 for the upper chest circumference, and 0.01 for thigh circumference. The above indicators did not show any significant or extremely significant differences in the control group.

3.2 Changes in physical functions before and after intervention

Table 2 Changes in Physical Functions Before and After Intervention N=16

Item	Before Intervention	After Intervention	T value	P value
Vital Capacity	3279.1±584.490	3384.9±563.560	-4.656	0.000

Statistical results showed that the P value of the vital capacity before and after intervention was 0.000, which was less than 0.01, with extremely significant difference. The indicator vital capacity did not show any significant or extremely significant differences in the control group.

3.3 Changes of physical fitness before and after intervention

Table 3 Changes of Physical Fitness Before and After Intervention N=16

Item	Before Intervention	After Intervention	T value	P value
Seated Forward Bend (cm)	14.4±4.457	14.0±4.340	2.636	0.019
Standing Long Jump (cm)	142.9±23.827	143.9±24.169	-0.891	0.387
50M (s)	10.2±0.882	9.9±0.987	3.578	0.003
800M (s)	335.6±31.179	325.0±22.879	3.654	0.002
Sit-up (/min)	27.1±10.392	29.5±8.733	-3.45	0.004

Statistical results showed that the P value of seated forward bend was 0.019, less than 0.05, with significant difference. The P value of 50m run was 0.003, less than 0.01, with extremely significant difference. The P value of 800m run was 0.002, less than 0.01, with extremely significant difference. The P value of sit-ups was 0.004, less than 0.01, with extremely significant difference. The indicators of 50m run, 800m run and sit-up showed significant difference, indicating improvement in the speed and endurance of subjects.

The body weight and upper chest circumference showed a significant downward trend, while thigh circumference showed a significant upward trend. The average and standard deviation revealed a significant decrease in the circumference of upper chest, upper arm and waist.

Analysis showed that Baduanjin has certain effects on improving the physical shape of obese female college students. In practice, the students need to maintain stability of the lower limbs when doing lunge, horse step and single-leg support so that the thigh could be fully stretched, as evidenced by improved indicators. In the experiment, the subjects had sufficient training every week and kept a good diet and sleep as before the experiment, transforming the consumption of energies into changes in body circumference and weight loss.

4. DISCUSSION AND SUGGESTION

The background music used for practicing Baduanjin was gentle and cheerful, enabling practitioner to improve efficiency, eliminate fatigue and adjust the mood.1 As an aerobic exercise, Baduanjin is composed of eight movements, each of which is interrelated with the other to help adjust the spine and breathe.

4.1 Indicators of physical shape

Table 1 shows that there is significant difference in the physical shape of subjects before and after the 16-week intervention, especially for the upper chest and thigh

4.2 Indicators of physical functions

Table 2 shows significant difference in the vital capacity of subjects before and after the 16-week intervention. The intensity of Baduanjin is equivalent to aerobic exercise. In practice, attention should be paid to the coordination of spine maintenance and breathing. The background music provides support to the breathing exercise, which will help improve lung function.

4.3 Indicators of physical fitness

Table 3 shows significant difference in the physical flexibility of subjects before and after the 16-week intervention when practicing forward bends, with a downward trend of performance, which is contrary to the expectation of improvement. Considering the season before and after the experiment was late summer and early winter respectively, the temperature difference could affect the clothes and ligament extension of the subjects, thus causing fluctuation in the value. The test result of this indicator was reduced to a greater extent in the control group. The indicators of 50m run, 800m run and 1min sit-up represent speed, endurance and core strength respectively, all of which showed extremely significant difference, indicating that after the 16-week Baduanjin practice, the physical fitness of the subjects has been significantly improved. However, there was no significance difference in the above indicators in the control group.

4.4 Suggestion

Due to the limitation of time and funds, there was no a large scale of samples in this study, something that could be improved in later study to enhance the credibility of data in comparative experiments. Devices used to measure body composition can be used in the study to indirectly monitor the accuracy of the test indicators. In case of sufficient funds and experimental assistants, factors such as the training time, training place, meal and sleep can be set at a certain level so as to better observe the physical condition of the subjects before and after the experiment.

4.5 Conclusion

The experiment revealed that the 16-week Baduanjin intervention has a positive effect on the physical health of obese female college students, including improvement in physical shape indicators such as BMI, upper chest circumference and waist circumference, physical function indicators like vital capacity, and physical fitness indicators like 50m run, 800m run and sit-ups.

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