Original Article

Effects of Yoga Exercise on Body Shape and Cardiovascular Function of Female College Students

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Abstract

Objectives: The objective is to explore effects of yoga exercise on body shape and cardiovascular function of female college students. **Methods:** One hundred and twenty female college students were selected as the study participants, and they were randomly divided into observation group and control group, with 60 participants in each group. The control group of female college students has routine life and learning, while the observation group of college students has an 18-week yoga practice. The exercise frequency is three times a week, 90 min/times, between $50VO2_{max}$ and $60VO2_{max}$, mainly including preparation activities, pose exercises, and relaxation exercises after the end. Moreover, the physical form index of two groups of female students was compared. **Results:** The body mass index, LIVI, WHR, VEK, HR, SV, SI, CI, VPELs, MSP, MDP, AC, ETK, and STR of the observation group female college students were significantly better than those in the control group. The difference between the two groups was significant, and the difference was statistically significant ($P < 0.05$). **Conclusions:** By means of yoga practice, the physical form of female college students can be obviously improved, and the function of losing weight can be achieved. It can also improve the cardiovascular function of female college students, and the effect of exercise is very remarkable.

Keywords: Cardiovascular, routine life, yoga exercise

Introduction

Yoga is a cultural movement that originated in ancient India. It came from Sanskrit or Hindus, meaning unity or harmony, by raising people's consciousness.[1] Yoga itself is ancient and easy to master, and plays an important role in improving people's physiology, psychology, emotion, and spirit, and helps to realize the harmonious unity of body, mind, and spirit. Yoga has been developed to date not only as a form of exercise, but also as a worldwide fitness method, widely spread from India to Europe and the United States, Asia Pacific, Africa, and other places. In modern times, there are also a number of influential yoga characters. In modern society, people's material living standard has been improved significantly, but life satisfaction has not been greatly improved. One of the important reasons is that the living pressure of contemporary people is also rising with the improvement of material level. The mental load is increasing, and food safety has become one of the concerns of people.[2] In this case, people are enthusiastic about yoga as a fashionable and practical sport. More and more people in yoga practice have gained a variety of physical and mental benefits from the process of yoga practice, especially female college students with good educational background. Their enthusiasm for yoga is becoming more and more obvious with the acceleration of the process of yoga in China.[3] Yoga has become familiar to female college students with remarkable characteristics of the times. It has even become a synonym for fashion and sports. At the same time, it has evolved a new yoga method with outstanding characteristics from the original yoga. Such as yoga, ball yoga, hot yoga, Hatha yoga, high-temperature yoga, fitness yoga, and some yoga management science.

Overview

It is helpful to broaden the scope and depth of yoga research. In the process of combing the relevant studies in the field of yoga in China, it is found that most of the studies focus on the general body and mind promotion of yoga, the history of

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yoga, the present situation and countermeasures of the yoga curriculum, and the yoga culture. The comparisons of yoga with other sports, and so on, but there are few biological methods to study the effects of yoga on people's physiological characteristics. However, it is blank to further explore the effects of different types of yoga on human body shape and cardiovascular function. Therefore, this paper tries to use empirical persuasion. It is proved that the influence of ball yoga and flow yoga on the body shape and cardiovascular state in the process of female college students' practice has effectively promoted the scope and depth of the research in the field of yoga and enriched the theoretical research field of modern yoga.

Methods

From the Yoga Club of Central China Normal University, the names of female college students who have no smoking, alcohol and other unhealthy habits, and physical health without cardiovascular and cerebrovascular diseases are randomly selected.[4] They were randomly divided into two groups. The first group was the control group for routine study and life, the second group was the experimental group for weekly yoga, the third group for the experimental group for a week of ball yoga practice, each group. To control independent variables, reduce errors, flow yoga, and ball yoga are taught by me. This experiment is a single blind experiment. The participants agreed to participate in the experiment without knowing it. Yoga is practiced for a week from day to day. The basic information of the participants is shown in Table 1. There is no significant difference in height, weight, age, systolic blood pressure, and diastolic pressure between the participants before the experiment ($P < 0.05$).

Conditional control

In the whole teaching experiment, two groups of experimental conditions are strictly controlled.[5] The control group did not participate in any form of physical activity, the experimental group used the form of club teaching exercise intensity was moderate intensity, the heart rate was controlled in the subscore (using heart rate telemeter to monitor the exercise time was minutes), exercise frequency is weekly. The effects of different types of yoga on the body shape and cardiovascular function of female college students were tested [Figure 1].

Through the library of Wuhan Institute of Physical Education, the library of the Institute of Physical Education of Central China Normal University and other books and electronic resources, it lays a theoretical foundation for the later experimental research. The expert interview method conducted random interviews with coaches, teachers, scholars, and experts engaged in different types of yoga projects in Hubei Province, evaluated the validity of the questionnaire design, and conducted expert consultation on some questions related to research. Understand their ideas and suggestions. Female students were randomly selected from the registration list of Yoga Club of Central China Normal University.[6] The control group was given routine study and life, and no yoga exercise was conducted in the experimental group. The experimental group (for a week of ball yoga) practiced twice a week for each minute, including preparation, asana, and relaxation.

Table 1: The difference between men and women

Group	Female (age)	Male (age)
Yoga	63.8	64.7
Control	62.3	62.5

Test time

The experiment was carried out years before the experiment

Main outcome measures of body shape

Body mass index (the formula for calculating body height [height chest circumference index] is the waist–hip ratio of chest circumference) (measured by nylon tape; Warwick Index, the formula is weight, chest circumference, height, skinfold thickness; measurement method). The participants stood naturally and fully exposed their abdomen. The testers used the left thumb, index finger, and middle finger to lift the abdominal subcutaneous tissue and measured the thickness of the skin fold under the lifting point. The median value or the same value twice was taken.

Main outcome measures of cardiac function

Main outcome measures of cardiac function are Pulse rate, cardiac output, cardiac index, and left ventricular effective pump force index.

Main parameters of vascular function

Mean systolic blood pressure, mean diastolic blood pressure, vascularity, elastic expansion coefficient of blood vessel, and standard circumference obstruction. The above indexes are tested by the type automatic cardiovascular function diagnostic instrument.

Blood of master's degree thesis main measures of liquid and microcirculation function

Effective blood volume, blood viscosity, reduced whole blood viscosity, semi-renewal rate of microcirculation,

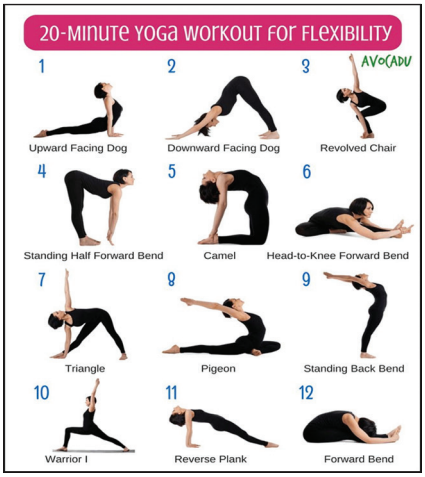

Figure 1: Twenty minutes simple yoga

semi-renewal time of microcirculation, and mean retention time of microcirculation.

Main testing instrument

Nylon tape ruler, skinfold thickness meter (developed by Beijing Chinese and Western Great Science and Technology Co., Ltd., Model:, Type: type automatic Cardiovascular function Diagnostics instrument, made by Anhui Institute of Electronic Science, product standard:, OMRON Intelligent Electronic Sphygmomanometer [produced by OMRON Co., Ltd., made in Japan] and height and weight Meter [produced in China by Anhui Institute of Electronic Science]). The experimental data obtained by mathematical statistics were analyzed and processed by statistical software, and the mean value ± standard deviation of each index was calculated, the difference between ± groups was tested by independent samples, and the difference between groups was tested by pairing test before and after the experiment. The difference is significant [Figure 2].

Results

Often not participating in sports activities may be one of the reasons for the uneven development of female college students' body morphology, and this bad habit is also one of the main culprits that cause the increasing obesity rate of college students at present. After the cycle of ball, flow yoga practice, the participants' value decreased significantly, abdominal skinfold thickness decreased very significantly, which shows that both kinds of yoga exercises have good effect of weight loss and weight loss. Willowick index is one of the composite indexes of anthropometry. It is the sum of body weight index and chest height index. This index can reflect the development level of human body. The experimental results showed that both kinds of yoga exercises could significantly increase the Warwick index and then improve the physical development level of female college students. Compared with the data of the two groups, ball yoga and flow yoga have an obvious effect on female college students' weight loss, and ball yoga is more effective than flow yoga in improving some indexes of female college students' body shape. The reason may be attributed to the unique color and various movements of ball yoga, female college students are happier to accept ball yoga psychologically, so it is more effective to improve some indexes of female college students' body shape.

Figure 2: The benefits of simple yoga

After two different types of yoga exercises during the week, the pulse rate decreased significantly and the cardiac output increased significantly. The above data changes are basically consistent with the existing research results. Studies have shown that yoga exercises slow the heart rate while quiet and reduce the energy consumption of the heart in a quiet state. Yoga exercises can increase muscle fiber, thicken the ventricular wall, increase the contractility of the heart, and increase the cardiac output per beat. Yoga can also reduce the level of catecholamine in circulating blood, reduce myocardial oxygen consumption, and reduce the burden of heart. The increase of cardiac output, cardiac index, and cardiac index showed that both kinds of yoga exercises could improve cardiac output, cardiac index, and cardiac index, and then improve human heart function. The left ventricular effective pump force index is the volume of systolic force that reflects the left ventricular effective systolic blood flow. The results of the two groups showed that both yoga exercises could significantly improve the left ventricular effective pump index [Table 1].

Conclusions

Ball yoga and flow yoga can effectively promote the body shape of college students, improve the heart and vascular function of college students, prevent and cure obesity, and cardiovascular diseases. In terms of the effect on body form, the two yoga exercises can, on the one hand, reduce the weight loss by reducing the number of chest circumference fingers and the thickness of the skin fold of the abdomen; on the other hand, they can reduce weight by increasing the value of the Verve index significantly. And then, improve the development level of female college students' body shape. According to the effect on heart function, two kinds of yoga exercises can increase cardiac pump output by reducing pulse rate and myocardial oxygen consumption index on the one hand, and increase cardiac pumping capacity on the other hand, and increase cardiac output by reducing pulse rate and myocardial oxygen consumption index. According to the effect on vascular function, both kinds of yoga exercises can lower blood pressure and blood lipid and then protect the blood vessels of heart, brain, kidney, and other important target organs. According to the effect on the function of microcirculation, the two kinds of yoga exercises obviously improved the microcirculation function of college students, increased the semi-renewal rate of microcirculation, shortened the half-renewal time of microcirculation, and the average retention time. Furthermore, the oxygen supply ability and material exchange ability of the body are improved.

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Conflicts of interest

There are no conflicts of interest.

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