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The Health Effects of Yoga on White-collar Women in Nanchang City

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***Abstract*—In recent years, with the rapid development of society, more and more urban women are working harder and harder. In addition to work, in order to relieve stress and maintain health, many urban white-collar women choose yoga to exercise. In this paper, 20 white-collar women in Jinhang Fitness Club were measured for body shape and physical fitness, and then a 24-week yoga training program was conducted on them. After the 24-week yoga training program, the body shape and physical fitness of these subjects were measured again. The results show after the training program: (1) the body shape, the physical quality and the physiological functions of the subjects are significantly better than before; (2) their weight, waist circumference, hip circumference, thigh circumference and other indicators are greatly decreased, which indicates that yoga exercise can improve physical fitness; (3) their 1-minute sit-ups and sitting body flexion scores are enhanced significantly, which proves that yoga practice can really boost waist strength, flexibility; (4) their lung capacity is also improved.**

Keywords—Yoga; White-collar Workers; Health Effects

I. INTRODUCTION

With the rapid development of the economy and the call for equal slogans, the social status of women has risen steadily, more and more women are entering the workplace, and due to women's work is serious and responsible, more and more units tend to recruit female workers [1]. As a result, the team of white-collar women have gradually expanded and become an indispensable part of all walks of life. However, due to the different physiological structures between men and women, in the work and life, female white-collar workers have to bear more pressure than men, which has caused many urban white-collar women to be in a "sub-health" state [2]. Although the current sub-health problems of white-collar women are widespread, they have attracted widespread attention from all sectors of society. However, the current situation is that nearly 50% of urban white-collar women have not taken any measures on sub-health issues [3]. After investigation, they generally believe that there is no need to go to hospital for treatment without major illness, and there is no need to pay special attention to sub-health. This is the general view of people. Yoga originated from ancient India and is one of the six major philosophical factions in ancient India. Ancient yoga pays attention to "Vatican and I are one", transcends self, and uses ancient and easy-to-master skills, including body posture method, breath-regulating breathing method, and meditation thoughts to achieve the unity of mind and body [4]. Modern yoga is adapted to the fast-paced lifestyle of human beings, with the aim of debugging the mind and body and eliminating troubles. During the yoga practice, by adjusting the breathing, the muscles are strengthened with gentle and slow movements to achieve the balance of the whole body; the muscles and joints of the whole body are trained with a complete and balanced contraction and stretching movement, and the spirit and consciousness are controlled by meditation. In the process of improving physical fitness, the psychology is fully adjusted, and the spirit of calmnes, and ease is achieved [5]. Many white-collar workers cannot choose drastic exercise because of their physical limitations. Therefore, they chose the sport of yoga. Many studies have shown that yoga can not only lose weight, but also play a role in strengthening the body [6-8]. However, many studies only discuss it from a theoretical level and lack of data to support it. Therefore, this article takes white-collar women as the research object and takes yoga as the entry point. It is planned to conduct a 24-week experiment on white-collar female members who have handled the annual card at Jinhang Fitness Club, and compare the data measured before the experiment with the data measured after the experiment. This proves whether yoga exercise can improve the body shape, physical quality and physiological function of urban white-collar women. If there is improvement, what is the effect? By studying the influence of yoga on the physical form, physical quality and physiological function of white-collar women, it can effectively improve the awareness of white-collar women to participate in sports, and promote the development of national fitness. At the same time, it can promote the development of yoga. Provide a more scientific exercise for white-collar women.

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II. Research Objects and Methods

A. Research objects

In this study, 20 white-collar women who first handled the annual card of Jinhang Fitness Club were selected as research objects. These 20 white-collar women have stable work and income, and most of them are unmarried. In order to ensure the accuracy and non-interference of the experimental results, the 20 white-collar women selected were the first time to do the card, and they had not been exposed to yoga before apply for membership cards, and the 20 white-collar women were normal life during the experiment and just can't engage in any other physical exercise program

B. Research methods

1) Literature method

After confirming the topic, enter the China Knowledge Network to access relevant literature, through the organization and analysis of these materials, enrich the theoretical knowledge, broaden the research horizon, and clear the research ideas.

2) Experimental method

In order to ensure the accuracy of the experimental results, 20 white-collar women who had applied the annual card of Jinhang Fitness Club were selected for a 24-week yoga training. This training is conducted in two phases. The first week to the 12th week is the first phase. This phase is the yoga primary course, which mainly teaches some basic yoga postures and breathing methods. The 13th week to the 24th week is the second phase. The content is more complex than the primary course. The content taught is strictly implemented from the principle of easy to difficult, to ensure that members can learn step by step.

3) Test method

(1) Test indicators: body shape, physical fitness, physiological function, etc. are selected as test indicators. Body shape tests include height (cm), weight (kg), waist circumference (cm), hip circumference (cm), and thigh circumference (cm). Physical fitness tests include 1 minute sit-ups (s), sitting body flexion (cm), and long jump (cm). Physiological tests include lung capacity.

(2)Test equipment: height meter, weight scale, tape measure, stopwatch, sitting body flexion instrument, spirometer.

(3)Test method: 20 white-collar women who had handled the annual card of Jinhang Fitness Club were tested before the experiment, 12 weeks after the experiment, and 24 weeks after the experiment, Record the test results. In order to ensure the accuracy of the experiment, the standards and personnel of the three tests must be consistent.

4) Mathematical statistics

After the measurement, the body shape, physical fitness and physiological function data obtained by the experimenter were tested into the Excel table, Organize and analyze with excel software and SPSS software, and perform statistics and charting on the data before, during and after the experiment. Compare the three test results and find out the yoga practice for the white-collar female body. There was no difference in the effect of the condition. $P>0.05$ was considered as no significant difference. $P<0.05$ was considered to be significant, and $P < 0.01$ was considered to be very significant.

III. Results and Analysis

A. Analysis of the effect of yoga practice on the body shape of white-collar women

As can be seen from Table 1, before the experiment, the mean heights of the 20 white-collar women were 162.13±3.45cm. After 12 weeks of yoga training, their height was 162.21±3.32cm, and after 12 weeks, their heights were 162.17±3.21cm. From the data point of view, their height does not have a tendency to grow ($P>0.05$), which means that there is no significant difference. Because they have passed the critical period of growth and development, the bones have been closed, and it is not realistic to rely on exercise to increase [9]. Different from the height index, after 20 weeks of yoga practice, the weight, waist circumference, hip circumference, thigh circumference and other indicators of the 20 white-collar women have changed to varying degrees. After 20 weeks of yoga practice, the weight, waist circumference, hip circumference, and thigh circumference were significantly decline. The weight decreased from 58.26±3.56kg to 52.67±3.25kg, the waist circumference decreased from 80.25±2.45cm to 77.14±2.67cm, the hip circumference decreased from 95.07±3.12cm to 88.24±2.65cm, and the thigh circumference decreased from 55.09±2.75cm to 51.78±2 59cm. Regardless of whether the first week is compared with the 12th week, the 12th week is compared with the 24th week, or the first week is compared with the 24th week, the weight, waist circumference, hip circumference, and thigh circumference of the practitioner are great changes, and this change has a significant difference ($P <0.01$). At the same time, we also noticed that the decline in body shape indicators was most pronounced in weeks 1-24, the second most significant was weeks 13-24, followed by weeks 1-12 weeks, The most obvious reason for the decline in the 1st-24th week is because the practitioners spend a lot of time on training, so the effect is also the most obvious. However, the practice time for weeks 1-12 and Weeks 13-24 is identical. Why is the training effect for the 13th-24th week better than the 1st-12th week? The reason is that in the course arrangement. In the exercises in the 1st-12th week, the yoga elementary course is arranged, and in the 13th to 24th week, the advanced course of yoga is arranged. In the exercises in the 1st to 12th week, because the selected practitioners are white-collar women who have never been exposed to yoga, the practice content of the exercises is relatively basic and simple, and the training intensity is not large. Each position requires a short time. These factors make the practitioners' progress in the improvement of body shape less obvious; however, in the 13th-24th week, because they have been trained for 12 weeks, members have already had a certain yoga foundation, Therefore, the yoga training position at this time is more difficult, the action persistence time is extended, and the strength are improved compared with before. The increase in difficulty, the extension of practice time, and the increase in strength and strength make the improvement of the body shape of the practitioners in the 13th to 24th week significantly larger than the first 12 weeks, which indicates that

the long-term practice of yoga is better than the short-term practice in reducing fat and shaping.

TABLE I BODY SHAPE RELATED INDICATORS OF SUBJECTS BEFORE, DURING AND AFTER THE EXPERIMENT (N=20)

	Before	12th Week	24th Week
Height(cm)	162.13±3.45	162.21±3.32	162.17±3.21
Weight(kg)	58.26±3.56	56.34±3.12	52.67±3.25
Waist circumference(cm)	80.25±2.45	79.37±2.98	77.14±2.67
Hip circumference(cm)	95.07±3.12	93.82±2.55	88.24±2.65
Thigh circumference(cm)	55.09±2.75	54.12±2.17	51.78±2.59

B. Analysis of the effect of yoga practice on the physical fitness of white-collar women

The sitting body flexion reflects the flexibility of the joints and muscles, while the flexibility refers to the joints of the body. The range of activity and the ability to stretch and stretch the ligaments, muscle bonds, muscles, skin and other tissues across the joints is an important physical component [10]. It can be seen from Table 2 that the number of sit-ups for the practitioners before the experiment was 18.74±6.23, and the number of sit-ups for the 20 white-collar women was 24.56±5.67 after 12 weeks of practice, increased by about 5, and after 12 weeks of practice, the number of sit-ups by practitioners reached 30.87±5.67, compared with Week 12, it has increased by 6 and has increased by 12 compared with the first week. It can be seen that yoga training significant effect on enhancing waist and abdomen strength. In addition, after 12 weeks of training, the practitioner's sitting body flexion increased from 10.23±3.13cm in the first week to 12.34±2.89cm, and after 12 weeks of training. From 12.34±2.89cm to 15.67±2.69cm, the 24th week is 5cm longer than the first week, and 3cm longer than the 12th week. The growth is more obvious. It can be seen that yoga exercise has a good effect on improving flexibility. In summary, the improvement of the indicators such as sit-ups and sitting body flexion indicates is significant ($P < 0.01$). It shows that as long as the scientific and regular physical exercise is adhered to, the physical strength of the waist and abdomen muscles and the body flexibility can be improved, and the physiological decline of the white-collar women's physical fitness is slowed down. In addition, before the training, the practitioner set a long jump score was 178.22±1.23cm. After 12 weeks of training, the practitioner set a long jump score was 179.1±0.98cm, and then carried out 12 weeks of training, the practitioner's score was 179.12±1.34cm, although from the data, the practitioner's standing long jump score increased by 1-2cm. However, when the T test was performed, it was found that this increase was not significantly different ($P>0.05$). That is to say, the yoga exercise did not increase the strength of the lower limbs.

TABLE II PHYSICAL FITNESS RELATED INDICATORS OF SUBJECTS BEFORE, DURING AND AFTER THE EXPERIMENT (N=20)

	Before	12th Week	24th Week
Sit-ups	18.74±6.23	24.56±5.67	30.87±5.67
Sitting position flexion(cm)	10.23±3.13	12.34±2.89	15.67±2.69
Standinglong jump(cm)	178.2±1.23	179.1±0.98	179.12±1.34

C. Analysis of the effect of yoga practice on the physiological function of white-collar women

It can be observed from Table 3 that the lung capacity of the 20 white-collar women before the experiment was 2367±8.23ml. After 12 weeks of training, the vital capacity index increased to 2478±7.64ml, which increased by about 111ml; After 12 weeks of training, the lung capacity increased from 24,78±7.64 ml to 26,72±6.38 ml, an increase of 194 ml. Compared with the 12th week and the 1st week, or the 24th week and the 12th week, The lung activity index of the experimenters increased significantly, especially in the last 12 weeks, the lung vitality index increased more than the first 12 weeks, $P<0.01$, with significant difference. The breathing form of yoga is different from the normal breathing form. During the yoga exercise, the practitioner uses chest breathing, abdominal breathing and chest-abdominal breathing, all of which are beneficial to the improvement of vital capacity.

TABLE III PHYSIOLOGY AND FUNCTION RELATED INDICATORS OF SUBJECTS BEFORE, DURING AND AFTER THE EXPERIMENT (N=20)

	Before	12th Week	24th Week
Lung capacity (ml)	2367±8.23	2478±7.64	2672±6.38

Note: $P>0.05$, the results are not significant; $P<0.01$, the results are significant

IV. CONCLUSION

(1) After the training program, the body shape, the physical quality and the physiological functions of the subjects were significantly better than the original

(2) After the training program, their weight, waist circumference, hip circumference, thigh circumference and other indicators were significantly decreased, which indicating that yoga exercise will indeed play a good role to physical fitness

(3) After the training program, their 1-minute sit-ups and sitting body flexion scores were improved significantly, which proves that yoga practice can really improve waist strength, flexibility;

(4) After the training program, their lung capacity was also improved.

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