

The Influence of Yoga Combined with Aerobics on Body Fat in Women

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Abstract—This paper analyses the effects of three kinds of exercises (yoga, aerobic gymnastics, aerobics and yoga) on the fitness effect and physiological load of young women. A total of 63 female college students were randomly selected and divided into 3 teams, with an average of 21 persons per team. Each member was tested for height, weight, chest circumference, waist circumference, waist-hip ratio, vital capacity, body composition, BMI, single foot strength, step index, forward bend, standing long jump and vertical jump. Then each team only exercises yoga, aerobics and aerobics exercises combined with yoga. After a two-and-a-half-month regular training, the above-mentioned tests were performed on each participant, and the data of the two groups were compared. The test results show that the exercise of yoga and aerobics only improves individual items. The combination of aerobics and yoga training mode can significantly improve the indicators of most test items. It can be seen that aerobics and yoga can improve the indicators of most test items.

Keywords—*aerobics, yoga, fitness, physiological load*

I. RESEARCH METHODS

A. Object of study

Sixty-three young female college students aged between 23 and 26 were randomly selected. They were required to have no organ diseases and not be required by doctors to participate in sports. The 21 girls were divided into A, B and C groups. Each group only exercises yoga, aerobics and aerobics combined with yoga. The 21 members of each group are numbered. For example, group A is divided into a1-a21, which facilitates the matching analysis of the test results by later statistics.

B. Specific content

(1) The basic index test of the physical condition of the subjects.

Routine measurements were made for each member of each team. The test data of height, weight, chest circumference, waist circumference, waist-hip ratio, vital capacity, body composition, BMI, single foot strength, step index, body forward bending, standing long jump and vertical jump were unified. After analysis and statistics, it was concluded that the above test results of the three groups were not clear. The obvious difference is shown in Figure 1.

(2) Exercise form, specific content and physiological load level of each group

The training time of these members is two and a half months, with an average of three days per week, and each time requires one hour. Each group of exercise time should have three steps: warm-up, formal and closing. The warm-up part and the closing part should take 10 minutes respectively, and the formal exercise should take 40 minutes. Each group has different ways of exercising, content and body load. Aerobic gymnastics group in the preheating stage is mainly to prevent muscle strain stretching movements, but also to preheat the cardiopulmonary energy system, so that the body in the best state into the formal exercise. During the warm-up period, the body's load is about 100-120bpm. Aerobics in formal exercise is a low-impact near-ground mode, which is easier to consume fat than high-impact mode, and can avoid ligament injury as much as possible. The double peak method of body load means that each member is required to reach the target heart rate twice on average during training. In this experiment, the target heart rate calculation standard is 120-160 bpm. The duration of the two data is controlled to 18-21 minutes. The ending part is mainly to regulate breathing, training for lumbar and abdominal muscles and relaxing muscle movements. The pure yoga training group mainly performs respiratory adjustment and mental relaxation in the warm-up part. Teachers guide the team members to stretch each part of the body in order from head to foot, gradually concentrating their consciousness to lay the foundation for the formal yoga exercise behind them. The body load of this group is 90-110bpm. The main part of formal sports is yoga in Europe and America. The basic point is the combined movement of hands, feet, shoulders, waist and crotch. The key point is to gradually increase the range of movement, and the frequency of breathing should be matched with the movement. The heart rate fluctuation at this stage is between the 120-140bpm range. After these studies, we found that among those who have a large body weight base and a lower center of gravity, those who have a relatively long duration of static balancing exercise are more likely to reach the target heart rate. The finishing part is mainly about adjusting breathing, emptying thoughts and relaxing the body. The Yoga combined group is consistent with aerobic exercises in the preheating part. Half of the formal part is aerobic exercise and half time yoga exercise. This part of the sports mode and body load is the same as the other two groups. The ending part is roughly the same as the yoga group.

(3) Experimental requirements

The training of each group should be carried out in the same time node, and the training venue should also be under the same conditions. This ensures the accuracy of the experiment. There are no more requirements for the members' diet, it is good according to their usual habits. But these members should not take other training exercises during the period of experiment.

C. Statistical research methods

All the data of the experiment were analyzed by computer statistical software. The data of these groups were tested and compared with the data of the same individual.

II. EXPERIMENTAL RESULTS

A. Comparison and Analysis of Data before and after Training in Each Group

The changes of body posture, function and motor literacy in 2 and a half months before and after training are shown in Figure 1.

B. A Comparative Analysis of the Average Difference between Groups before and after Training.

The changes of body posture, function and motor literacy in 2 and a half months before and after training are shown in Figure 2.

	有氧操组		瑜伽组		结合组	
	练习前	练习后	练习前	练习后	练习前	练习后
体重(kg)	63.33±5.43	61.49±5.41 ^②	63.93±6.00	62.66±6.01 ^②	63.58±7.42	61.22±7.26 ^②
体脂量(kg)	19.42±2.82	18.14±2.78 ^②	19.58±3.84	18.35±3.80 ^②	19.77±3.90	17.96±3.81 ^②
瘦体重(kg)	43.91±3.30	44.81±2.30 ^②	43.37±3.90	44.46±3.86 ^②	44.86±4.60	44.98±3.31 ^②
体脂率(%)	30.55±2.51	29.03±2.49 ^②	30.47±3.84	29.00±3.05 ^②	30.53±3.38	29.31±3.40 ^②
腰围(cm)	82.10±4.07	81.02±3.72 ^②	83.56±0.03	82.05±0.09 ^②	82.94±5.85	80.39±5.24 ^②
腰臀比	0.80±0.02	0.79±0.02 ^②	0.81±0.03	0.69±0.03 ^②	0.81±0.03	0.77±0.03 ^②
BMI	24.50±1.32	23.40±1.31 ^②	24.20±1.75	23.08±1.77 ^②	24.18±1.81	22.31±1.76 ^②
安静心率(bpm)	78.67±7.05	77.31±7.00 ^②	80.48±5.46	78.64±4.87 ^②	77.74±5.55	76.80±5.31 ^②
肺活量(ml)	3050.00±374.75	3239.62±362.94 ^③	3059.29±388.33	3092.86±348.35 ^③	3052.39±375.63	3175.00±363.05 ^③
台阶指数	47.55±3.05	48.81±2.98 ^②	48.85±5.46	49.29±5.43 ^②	47.86±3.06	50.22±3.98 ^②
体前屈(cm)	13.81±3.34	14.68±3.55 ^②	13.37±6.12	15.55±6.24 ^③	13.79±3.69	17.94±3.18 ^③
单足立(s)	0.70±0.70	1.62±0.70 ^③	0.71±0.66	2.53±0.75 ^③	0.68±0.59	3.70±1.05 ^③
纵跳(cm)	25.86±5.85	27.97±6.00 ^③	25.43±5.68	26.41±5.61 ^③	25.49±4.59	27.85±5.04 ^③
立定跳远(cm)	153.71±5.43	156.14±4.93 ^③	153.43±9.93	154.63±9.24 ^③	153.74±8.41	156.57±5.98 ^③

与练习前比较: ①P>0.05; ②P<0.05; ③P<0.01

Figure 1 Comparison Of Body Posture, Function And Motor Literacy Before And After Training (N=21)

III. ANALYSIS

A. The Function of Aerobics on Body Posture, Function and Sports Accomplishment

The improvement of step index and vital capacity of aerobic exercise group is very obvious before and after the experiment. It can be concluded that aerobic exercise is mainly stimulated by high intensity exercise to achieve body load, which can enhance human cardiopulmonary function. This group of training is not very helpful for sitting forward bending and standing with closed eyes, but it has a great improvement for vertical jump and standing long jump, which shows that this exercise is helpful for the strength of lower limbs.

Figure 1 shows that after 2 and a half months of Aerobics training, these members' weight, body fat rate and so on have been significantly improved, but the waist, hip circumference and weight of the lighter members have not changed significantly. It can be seen that the main effect of pure aerobics training is to reduce fat and reduce weight, but the effect of local fat reduction is not obvious. In these data, we can see that the waist and hip circumference data of these members have not changed much.

	有氧操组(n=21)	瑜伽组(n=21)	结合组(n=21)
体重(kg)	1.84±0.16	1.27±0.31 ^{④⑤}	2.36±0.38 ^④
体脂量(kg)	1.28±0.13	1.23±0.12 ^{④⑤}	1.81±0.33 ^④
瘦体重(kg)	0.10±0.06	0.09±0.13 ^{④⑤}	0.12±0.04 ^④
体脂率(%)	0.72±0.17	0.87±0.21 ^{④⑤}	1.22±0.42 ^④
腰围(cm)	1.08±0.59	1.51±0.79 ^{④⑤}	2.55±0.97 ^④
腰臀比	0.01±0.01	0.02±0.01 ^{④⑤}	0.04±0.01 ^④
BMI	1.10±0.07	0.93±0.12 ^{④⑤}	1.87±0.14 ^④
安静心率(bpm)	1.36±1.39	1.34±1.30 ^{④⑤}	1.64±1.69 ^④
肺活量(ml)	189.62±91.97	33.57±6.76 ^{④⑤}	122.61±39.60 ^④
台阶指数	1.26±0.9	0.44±0.09 ^{④⑤}	2.36±0.55 ^④
体前屈(cm)	1.07±0.4	2.18±0.87 ^{④⑤}	4.15±1.40 ^④
单足立(s)	0.92±0.	1.93±0.66 ^{④⑤}	3.02±0.55 ^④
纵跳(cm)	2.11±1.41	0.98±0.81 ^{④⑤}	2.36±1.31 ^④
立定跳远(cm)	2.42±2.09	1.20±2.05 ^{④⑤}	2.83±2.03 ^④

与有氧操组比较: ①P>0.05, ②P<0.05, ③P<0.01; 与结合组比较: ④P>0.05, ⑤P<0.05, ⑥P<0.01

Figure 2 Comparison of changes in body shape, function and sports literacy before and after exercise in each group (average difference between before and after training)

B. The Influence of Yoga Exercise on Body Posture, Function and Sports Literacy

Figure 1 shows that after two and a half months of yoga training, the weight, body fat rate, BIM, waist and hip circumference of the team have changed significantly. Less weight members changed little. These data can be concluded that yoga training can make trainers lose weight, and achieve the effect of partial weight loss, especially for the waist, which is very important for women in pursuit of a perfect figure. There was no significant change in step index and vital capacity, because yoga itself was a relatively gentle and slow way of exercise. The load strength of the body is not high enough to improve the vital capacity. However, there are obvious improvements in sitting forward bending and standing with closed eyes and one foot. There is little change in standing long jump and vertical jump. All these show that yoga is helpful to the flexibility of the body and the ability of coordination and balance of the limbs, but the training intensity of the legs is not high, so the help of jumping ability is quite obvious.

C. The role of aerobic gymnastics combined with yoga training in body shape, sports literacy

Figure 1 shows that after two and a half months of Aerobics combined with yoga exercise, the weight, body fat rate, BIM, fat content, hip circumference and waist circumference of the restructured members are significantly improved, but there is no significant change for the lighter members. The step index and lung capacity of the restructured members are also significantly improved. Obviously, it also plays an active role in standing with closed eyes and sitting forward, and the test results of standing long jump and vertical jump are also ideal changes.

IV. CONCLUSION

Two and a half months of Aerobics combined with yoga exercise can improve the weight, chest circumference, waist circumference, waist-hip ratio, vital capacity, body composition, and BIM, single-foot strength, step index, forward bending, standing long jump and jump test results. The combination of aerobics and yoga can give full play to the advantages of the two sports and play a more positive role and significance in women's fitness.

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