Original Article

The Effect of Different Sports Methods on the Body Composition of Female College Students with Recessive Obesity

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Abstract

Objectives: The objective of this study is to explore the effects of different exercise patterns on the body composition of female students with recessive obesity. **Methods:** According to the principle of knowledge and voluntariness, 136 female students who volunteered to participate in the investigation were selected as the research object. The IOI 353 analyzer was used to screen out 48 college students with invisibility obesity, which was averagely divided into the nonexercise group, the aerobic exercise group, the resistance training group, and the aerobic resistance group. The nonexercise group did not take any exercise, and the other groups performed 12 weeks of exercise. Before exercise, 4 weeks, 8 weeks, and 12 weeks after the exercise, each body component was detected. **Results:** Compared with those before the intervention, the body fat percentage (BF%) and waist-to-hip ratio (WHR) of the aerobic exercise group, the resistance training group, and the aerobic resistance group were significantly decreased. In addition, the body mass index (BMI) of the aerobic exercise group was significantly decreased, and the difference was statistically significant ($P < 0.05$). As compared to the control group, the BF% and WHR of the aerobic exercise group, the resistance training group, and the aerobic resistance group were better than that of the control group. Moreover, BMI in the aerobic exercise group was significantly better than that in the control group, and the difference was statistically significant ($P < 0.05$). **Conclusions:** The exercise has obvious improvement effect on the body composition of the invisible obese female college student body, which can reduce the body fat rate and improve the morphology. The different modes of movement also have an influence on their body composition, and the exercise mode can be selected reasonably in combination with their own situation.

Keywords: Aerobic exercise group, body mass index, nonexercise group, waist-to-hip ratio

Introduction

Obesity is a state of excessive accumulation of fat in the body. At present, the body fat rate (%) is used to judge obese people in the world. In general, those who have a body fat percentage (BF%) of 20% or above and women above 30% are considered to be "obese." In December 12, 2013, Guangdong Province Institute of Nutrition and health and the Zhongshan University School of public health in Beijing released the "2013 National Health Report" shows that the obesity detection rate reached 56.12%, which was 67.31% for men and 44.71% for women; among the normal-weight participants, the prevalence of recessive obesity has reached 15.42%, with men and women reaching 18.89% and 11.87%, respectively. Before the recessive obesity is in obesity, even in the range of the standard weight, body fat rate still exceeds the normal range (more than 20% men and 30% women); this state is called recessive obesity. Recessive obesity mainly decreased physical function because lean body mass (LBM) or lean body weight decreased; reduction of muscle mass and fat weight is still in the normal range, so it is not easy to find the potential obesity.[1] Therefore, recessive obesity is more harmful to people's health.

Overview

Recessive obesity appeared in young women in the crowd was higher, which may be related to them where in their daily life focus to lose weight with the improper diet and using a variety of slimming agents, also give excuse tired on physical activity. Studies have confirmed that exercise combined with

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health education can change body composition, increase LBM, and improve physical health. This study intends to observe and record the changes in body weight, body mass index (BMI), BF%, and waist-to-hip ratio (WHR) of the biological components of women in the obese university through 12 weeks of intervention.[2] The above methods can be used to explore the effect of different sports methods on body composition of female college students and to provide guidance for female college students in effectively reducing BF% and increasing LBM.

Methods

The participants were taken off their shoes and socks to wear short clothes and shorts and measured at 7:30–9:00 on the empty stomach.[3] The room temperature was controlled at 25°–28° centigrade. Then, the body composition of the participants was measured by the IOI353 body composition analyzer (Shanghai cinman Science Equipment Co., Ltd, 15F,No.2,Hua Shan Road, Shanghai 200040,P.R.China), and the bioimpedance was used to measure the body composition of the participants. In the subsequent 12 weeks of exercise intervention, body composition was detected in the 4th week, 8th week, and 12th week on Sunday at 7:30–9:00, respectively, record height and weight, BMI, BF%, and WHR changes.[4] The tests were completed by laboratory professionals in strict accordance with the operating procedures. Forty-eight participants were randomly divided into four groups and 10 nonsports groups. Aerobic exercise group of 12 people (1 time a week in addition to the 90 min sports weekly, 2, 4, 6–60 min at 16:30 at 18:30 for aerobic exercise, including preparatory activities of 10 min, the main activities of 40 min, and 10 min consolidation activities. The main activities is jogging, skipping, climbing, aerobics, and other forms of heart rate control for 65%–75% of maximum heart rate, HRmax, HRmax = 220 age (years), guided by the 2 mentors parallel medical supervision. In the resistance training group is12 people (except 1 weekly 90 min sports extracurricular activities, arranged 2 min, four, six 16:30 18:30), arranged 60 min of resistance training. Aerobic exercise combined with resistance training group 12 (except one time a week 90 min sports extracurricular, weekly two, four, six 16:30–18:30 arranged 60 min combined exercise, including the preparation of 10 min, the main activity 40 min, and the finishing activity 10 min, the main activity includes 20 min aerobic exercise and 20 min resistance training.[5] The status of the initial female students in each group is shown in Table 1.

Results

The effect of different sports interventions on the main body composition index of female undergraduates with hidden obesity is shown in Table 2 during the 4–8 weeks.[6]

The specific conditions of each group on the 12th weekend are shown in Table 3.

Conclusions

There was no significant difference in body composition between three types of sports for recessive obese female college students. However, according to the change trend of BMI, BF%, and WHR and previous studies, it is suggested that aerobic exercise can increase the energy supply ratio of fat metabolism. Resistance training can increase body weight, and the two kinds of exercise methods are more obvious.

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Conflicts of interest

There are no conflicts of interest.

Table 1: Status of initial female students in each group

Group	Weight/kg	BMI/(kg/m²)	BF%	WHR
Nonsports group	59.03±2.15	23.16±0.60	32.57±1.48	0.82±0.03
The aerobic exercise group	59.10±1.60	23.30±0.35	32.43±1.82	0.81±0.02
The resistance training group	59.20±3.28	23.03±0.45	32.32±1.46	0.81±0.02
The aerobic resistance group	58.81±3.13	23.28±0.45	32.18±1.53	0.81±0.02

BMI: Body mass index, BF%: Body fat percentage, WHR: Waist-to-hip ratio

Table 2: 4-8 weeks of specific conditions

Group	Intervention period	Weight/kg	BMI/(kg/m²)	BF%	WHR
Nonsports group	Week 4	59.13±2.08	23.20±0.56	32.59±1.37	0.81±0.03
	Week 8	59.49±1.96	23.33±0.61	32.48±1.18	0.82±0.02
The aerobic exercise group	Week 4	59.11±1.54	23.30±0.37	32.26±1.78	0.81±0.02
	Week 8	58.42±1.50	23.03±0.48	31.18±1.51	0.80±0.02
The resistance training group	Week 4	59.24±3.03	23.06±0.44	32.18±1.37	0.81±0.02
	Week 8	59.37±3.06	23.10±0.46	31.16±1.35	0.80±0.02
The aerobic resistance group	Week 4	58.89±2.91	23.31±0.32	31.91±1.46	0.81±0.01
	Week 8	58.43±3.15	23.14±0.37	30.46±1.27	0.80±0.01

BMI: Body mass index, BF%: Body fat percentage, WHR: Waist-to-hip ratio

Table 3: Week 12 group specifics

Group	Intervention period	Weight/kg	BMI/(kg/m²)	BF%	WHR
Nonsports group	Week 12	59.38±1.91	23.30±0.55	32.50±1.19	0.82±0.02
The aerobic exercise group		57.41±1.42	22.63±0.49	29.83±1.18	0.78±0.01
The resistance training group		58.74±2.87	22.88±0.42	30.37±1.44	0.79±0.01
The aerobic resistance group		58.06±3.04	22.98±0.22	29.29±1.08	0.78±0.01

BMI: Body mass index, BF%: Body fat percentage, WHR: Waist-to-hip ratio

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