

EXERCISE PRACTICE BY OBESE UNIVERSITY STUDENTS IN THE CONTEXT OF COVID-19



ORIGINAL ARTICLE
ARTIGO ORIGINAL
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PRÁTICA DE EXERCÍCIOS POR UNIVERSITÁRIOS OBESOS NO CONTEXTO DA COVID-19

PRÁCTICA DE EJERCICIOS POR UNIVERSITARIOS OBESOS EN EL CONTEXTO DEL COVID-19

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ABSTRACT

Introduction: The epidemic of COVID-19 has harmed the study and life of obese college students. While new research has pointed out that sports can improve body posture and alleviate psychological problems related to obesity. **Objective:** Explore obese college students' motivation to play sports and the effects of physical training during COVID-19. **Methods:** 100 obese college students were selected for the aerobic exercise intervention. Functional and biological indicators were analyzed before and after the experiment. **Results:** Body shape index, body fat content index, and sports quality index showed expressive changes. The average waist circumference decreased from 99.389 cm to 91.233 cm, an average loss of 8 cm; the average body fat was reduced from 34.644 kg to 30.492 kg after training, with an average decrease of 4 kg; vital capacity increased from 4,416.465 ml before training to 4968.085 ml after the intervention, with an average increase of 500 ml. **Conclusion:** It can be observed that aerobic exercise helps obese college students to improve their sports motivation, with positive impacts on mental health. The encouragement of sports and engagement in physical exercise tend to strengthen healthy habits, ensuring a better quality of life for college students. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: COVID-19; Management, Obesity; Exercise Therapy; Students.

RESUMO

Introdução: A epidemia da COVID-19 teve um impacto negativo no estudo e na vida dos estudantes universitários obesos. Novas pesquisas apontaram que o esporte pode melhorar a postura corporal e aliviar problemas psicológicos, incluindo aqueles relacionados à obesidade. **Objetivo:** Explorar a motivação dos estudantes universitários obesos na prática de esportes e os efeitos do treinamento físico durante a COVID-19. **Métodos:** 100 estudantes universitários obesos foram selecionados para a intervenção com exercícios aeróbicos. Indicadores funcionais e biológicos foram analisados antes e depois do experimento. **Resultados:** O índice de forma corporal, índice de conteúdo de gordura corporal e índice de qualidade esportiva apresentaram alterações expressivas. A circunferência média da cintura diminuiu de 99,389 cm para 91,233 cm, com perda média de 8 cm; a gordura corporal média foi reduzida de 34,644 kg para 30,492 kg após o treinamento, com uma diminuição média de 4 kg; a capacidade vital elevou-se de 4.416,465 ml antes do treinamento para 4968,085 ml após a intervenção, com um aumento médio de 500 ml. **Conclusão:** Pode-se observar que o exercício aeróbico auxilia os estudantes universitários obesos a melhorarem a sua motivação esportiva, com impactos positivos na saúde mental. O estímulo ao esporte e o engajamento pelo exercício físico tendem a fortalecer os hábitos saudáveis garantindo uma melhor qualidade de vida aos universitários. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: COVID-19; Controle da Obesidade; Terapia por Exercício; Estudantes.

RESUMEN

Introducción: La epidemia de COVID-19 ha tenido un impacto negativo en el estudio y la vida de los universitarios obesos. Nuevas investigaciones han señalado que el deporte puede mejorar la postura corporal y aliviar problemas psicológicos, incluidos los relacionados con la obesidad. **Objetivo:** Explorar la motivación de los estudiantes universitarios obesos para practicar deporte y los efectos del entrenamiento físico durante el COVID-19. **Métodos:** Se seleccionaron 100 estudiantes universitarios obesos para una intervención de ejercicio aeróbico. Se analizaron indicadores funcionales y biológicos antes y después del experimento. **Resultados:** El índice de forma corporal, el índice de contenido de grasa corporal y el índice de calidad deportiva mostraron cambios expresivos. El perímetro medio de la cintura disminuyó de 99,389 cm a 91,233 cm, con una pérdida media de 8 cm; la grasa corporal media se redujo de 34,644 kg a 30,492 kg tras el entrenamiento, con una disminución media de 4 kg; la capacidad vital aumentó de 4.416,465 ml antes del entrenamiento a 4.968,085 ml después de la intervención, con un aumento medio de 500 ml. **Conclusión:** Se puede observar que el ejercicio aeróbico ayuda a los estudiantes universitarios obesos a mejorar su motivación deportiva, con repercusiones positivas en la salud mental. La estimulación del deporte y el compromiso con el ejercicio físico tienden a reforzar los hábitos saludables garantizando una mejor calidad de vida a los estudiantes universitarios. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptorios: COVID-19; Gestión de la Obesidad; Terapia por Ejercicio; Estudiantes.



INTRODUCTION

The outbreak of COVID-19 has affected the global development speed and pace of life. Although the COVID-19 in China has tended to be preventable and controllable, the impact of COVID-19 on people has not faded away, especially on the physical and mental health of college students.¹ During the period of normalized epidemic prevention, college students experienced isolation at home and online teaching. After offline teaching was resumed, most schools were still under closed management. The outdoor sports and collective sports of college students are restricted by closed management and epidemic prevention and control, resulting in the obstruction of most college students' exercise behavior.² At present, the number of obese college students is increasing. The original pace of life has been destroyed due to the COVID-19. Many obese college students have experienced psychological anxiety, disordered work and rest, and worse body shape. More and more researchers have explored the issue of exercise for obese college students.³ The sports motivation of obese college students can be analyzed from multiple perspectives. Generally speaking, the influencing factors can be divided into the following two aspects: internal needs and external factors.⁴ There are also many kinds of exercise motivations needed by individuals, for example, obese college students may want to achieve the goal of slimming down and becoming beautiful through sports; It may also be because of the great psychological pressure and learning pressure, and want to relieve the psychological pressure and relax the body and mind through sports; Or they want to increase social contact and get the opportunity to communicate with others through sports. The influence of external factors may be due to academic requirements.⁵ Obese college students hope to get better test results in physical education classes; It may be to gain attention and respect among students and be influenced by the external environment. College students are in the best period of growing their minds, and are about to enter the society and become the mainstay of construction and development.⁶ Understanding the sports motivation of obese college students in the post COVID-19 era, and discussing the effect of sports exercise can help obese college students to more clearly understand their own sports direction and goals, adjust their exercise methods and means, and develop scientific exercise habits.⁷ Therefore, under the background of COVID-19, this paper studies the sports motivation of obese college students and the effect of exercise through experiments, which provides a theoretical reference and practical basis for the sports of obese college students.

METHOD

In this paper, 100 obese college students from a university were selected to participate in physical exercise intervention for all college students participating in the experiment. The study and all the participants were reviewed and approved by Ethics Committee of Huzhou University(NO.21UZUST075). The changes of the following five evaluation indicators were observed before and after the experiment. Among them, body shape indicators included four dimensions: weight (kg), waist circumference (cm), hip circumference (cm), waist hip ratio. Body fat content indicators included four dimensions: BMI (kg/m²), fat free weight (kg), body fat (kg), and body fat rate (%). The sports quality index includes four dimensions: vital capacity (ml), 50 meters (s), standing long jump (cm), and 1000 meters (s). The sports motivation includes five dimensions: hobbies, physical fitness, emotional experience, self-worth, and social interaction. The health score includes five dimensions: depression, anxiety, learning pressure, emotional imbalance, and psychological imbalance.

This experiment requires the subjects to exercise strictly according to the experimental design, control the diet of obese college students, and stipulate that all subjects should not overeat when eating at school,

so as to reduce the influence of other factors as much as possible. All subjects had clear self-awareness, actively participated in this experiment, and had no other diseases. All data of this experiment were analyzed using SPSS19.0 software.

RESULTS

Changes in exercise effect of obese college students

After the experimental intervention, the effect of sports training for obese college students is relatively obvious, and the body shape and body fat content have changed significantly. It can be seen from the data in Table 1 that the test results of four dimensions of obese college students have decreased significantly.

It can be seen from the data in Table 2 that the test results of the following four dimensions of obese college students have decreased to some extent. Among them, the BMI index was 33.003 ± 7.2307 kg/m² before training and 31.124 ± 6.3674 kg/m² after training, with an average decrease of about 2 kg/m²; The body weight without fat was 56.291 ± 8.9382 kg before training and 55.590 ± 7.9311 kg after training, with an average decrease of about 1kg; Body fat was 34.644 ± 13.6648 kg before training and 30.492 ± 12.0450 kg after training, with an average decrease of about 4kg; Body fat rate was $37.447 \pm 6.4850\%$ before training and $34.092 \pm 6.6563\%$ after training, with an average decrease of about 4%. Combined with the data analysis results, it can be seen that the experimental intervention effect is relatively obvious.

It can be seen from the data in Table 3 that the following four sports test scores of obese college students have improved. The vital capacity before training was 4416.465 ± 746.2101 ml, and after training was 4968.085 ± 651.8312 ml, with an average increase of about 500 ml; The 50 meters before training were 7.534 ± 0.6258 s, and the 50 meters after training were 6.957 ± 0.6442 s. The speed increased by about 0.6s; The standing long jump before training was 221.279 ± 21.5885 cm, and it was 223.505 ± 14.6166 cm after training, with the length increased by about 2cm; The first kilometer of training is 285.497 ± 53.8011 s, and the second kilometer of training is 227.871 ± 21.4059 s. The speed is increased by about 8s. It can be seen from the above four sports test results that physical exercise can improve the sports quality of obese college students.

Table 1. Changes of body shape of obese college students before and after exercise training.

Body shape index	Before training	After training
Weight (kg)	90.179 \pm 22.1558	86.968 \pm 19.7896
Waist circumference (cm)	99.389 \pm 14.6579	91.233 \pm 11.1272
Hip circumference (cm)	110.404 \pm 16.6688	109.431 \pm 14.0068
Waist hip ratio	0.877 \pm 0.0508	0.809 \pm 0.0299

Table 2. Changes of body fat content of obese college students before and after exercise training.

Body shape index	Before training	After training
BMI(kg/m ²)	33.003 \pm 7.2307	31.124 \pm 6.3674
Fat free weight (kg)	56.291 \pm 8.9382	55.590 \pm 7.9311
Body fat (kg)	34.644 \pm 13.6648	30.492 \pm 12.0450
Body fat percentage (%)	37.447 \pm 6.4850	34.092 \pm 6.6563

Table 3. Changes of Sports Quality of Obese College Students before and after Sports Training.

Body shape index	Before training	After training
Vital capacity (ml)	4416.465 \pm 746.2101	4968.085 \pm 651.8312
Fifty meters (s)	7.534 \pm 0.6258	6.957 \pm 0.6442
Standing long jump (cm)	221.279 \pm 21.5885	223.505 \pm 14.6166
One thousand meters (s)	285.497 \pm 53.8011	227.871 \pm 21.4059

Changes in exercise motivation and health score of obese college students

Through the questionnaire survey, it can be seen that in the context of the prevention and control of the COVID-19, the specific sports motivation of obese college students is shown in Figure 1. Before the experimental intervention of sports training, the highest score of obese college students' sports motivation was social interaction, the second was physical fitness, and the levels of emotional experience, hobbies and self-worth motivation were in the third, fourth and fifth places respectively. After the intervention of the sports training experiment, the obese college students' sports motivation level is in the first place for physical fitness, the emotional experience motivation level is in the second place, and their self-worth, hobbies and social interaction are in the third, fourth and fifth places respectively.

This paper has scored the factors affecting the health of obese college students, and the specific changes in the scores are shown in Figure 2. It can be seen from the figure that before the experimental training, anxiety was the highest indicator affecting college students' health scores, followed by psychological imbalance and depression, and learning pressure and emotional imbalance ranked fourth and fifth. After the experimental exercise intervention, the indexes of the influencing factors on the health of obese college students have decreased to a certain extent. Among them, the lowest score for the impact on the health of obese college students is emotional imbalance, down from 1.495 before the experiment to 0.417, and the highest score is still the anxiety index, down from 2.318 before the training to 0.827.

DISCUSSION

Analysis of changes in exercise effect of obese college students

After the intervention of aerobic exercise training proposed in this paper, obese college students have achieved a relatively obvious training effect, and their body shape and body fat content have changed significantly. After 13 weeks of experiment, the weight, waist circumference and hip circumference of obese college students have significantly decreased, with weight loss of about 4kg, waist circumference of about 8cm and hip circumference of about 1cm. In this experiment, the subjects were assigned to exercise badminton, rope skipping and aerobics. After training, the performance of obese college students in four items, namely, vital capacity, 50m, standing long jump and 1000m, were improved. The vital capacity increased by about 500ml, the running time in 50m decreased by about 0.6s, the length of standing long jump increased by about 2cm, and the running time in 1000m shortened by about 8s. Through the test of the above experimental indicators, it can be seen that the aerobic exercise in this study can help obese college students improve the training effect, and it is very effective for obese college students to improve their posture and body fat. Aerobic exercise is a kind of training method with relatively low intensity, long training time, and easy to master. This kind of exercise has a positive impact on the posture of obese college students. The relevant research shows that after the obese college students take aerobic exercise training, the body quality can be significantly improved, especially the cardiopulmonary endurance of obese college students, which has a significant improvement in lung function.

In order to provide more sports platforms, colleges and universities can set up sports clubs or sports training venues for obese college students, and provide sports events that are suitable for the physical and mental characteristics of obese college students, such as the aerobic exercise proposed in this paper, to play the positive role of the college sports education platform and create a positive exercise range. At the same time, colleges and universities should also reasonably arrange

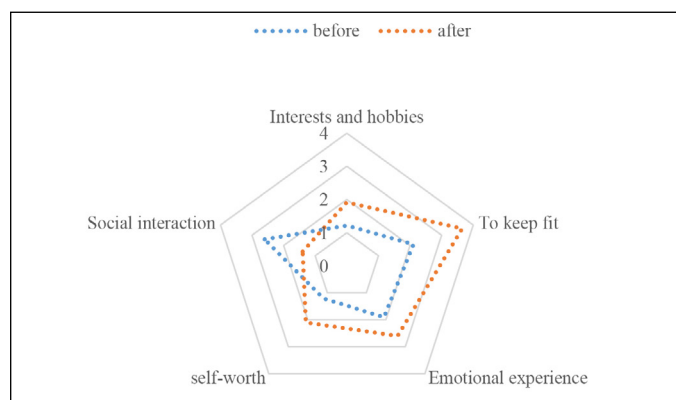


Figure 1. Changes of sports motivation scores of obese college students in the context of COVID-19.

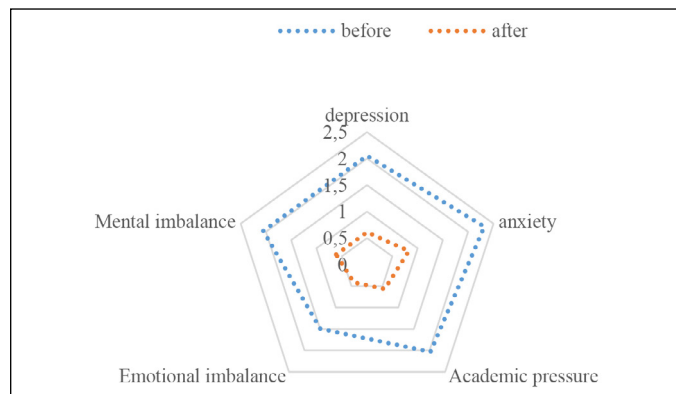


Figure 2. Changes in the establishment of health scores for obese college students in the context of COVID-19.

teaching staff to provide free sports guidance for obese college students, help obese college students who lack sports knowledge to continuously improve their theoretical knowledge and skill level of physical exercise, further improve obese college students' comprehensive understanding of sports, and stimulate their enthusiasm and passion for exercise. In addition, an important way to reduce weight is to control the intake of calories and increase the consumption of energy. Therefore, qualified colleges and universities can provide scientific and reasonable nutritious meals for obese college students through canteens to help them develop scientific eating habits and improve their health.

Analysis on the change of exercise motivation and health score of obese college students

Through the analysis of this experiment, it can be seen that the social interaction motivation and physical fitness motivation of obese college students are the highest, while the emotional experience motivation, hobby motivation and self-worth motivation are relatively low. Under the continuous influence of the COVID-19, the life of obese college students, like that of most college students, has lost the fun of off campus sports, so the life on campus has become more boring. Therefore, many college students, including obese college students, hope to gain more opportunities for social interaction through sports, and gain happiness and sense of happiness from social interaction. As the COVID-19 has hit people, more and more obese college students have realized the importance of physical health, so obese college students have the desire to strengthen their bodies. They hope to improve their physical fitness and resistance through sports and help themselves to get a healthier life. There are many ways to participate in sports exercises. Obese college students can participate in the activities of friends and classmates during sports, and improve their self-confidence and self acceptance by walking together.

This paper established a comparative experiment on the health scores of obese college students. After aerobic exercise training, the five health scores of obese college students decreased. The key factors affecting the health of obese college students are anxiety, followed by psychological imbalance, and some obese college students have depression, learning pressure, emotional imbalance and other problems. These factors will directly affect the health of obese college students. Obese college students have psychological problems of anxiety due to their large weight and not beautiful body shape. After the intervention of sports training, their weight has decreased and their body shape has improved, so sports exercise can help obese college students improve their sense of self-worth. This change is not only physical, but also can strengthen the self-confidence of obese college students and improve their sense of self acceptance. Therefore, the aerobic exercise proposed in this paper has a positive role in promoting obese college students. For obese college students, their mental health problems are more than ordinary college students, so they need more exercise to solve their mental problems. Through aerobic exercise training, obese college students have more friends and classmates to accompany, support, encourage, for their psychological problems have been significantly improved.

CONCLUSION

This paper conducts an experimental study on the exercise motivation and exercise effect of obese college students. The exercise motivation of

obese college students mainly consists of social communication, physical fitness, etc. The key factor affecting the mental health of obese college students is anxiety. After the aerobic exercise experimental training proposed in this paper, the main exercise motivation of obese college students becomes physical fitness, emotional experience, not social communication, and psychological problems have also been improved. The body shape of obese college students has improved significantly, their weight has decreased significantly, and other physical quality indicators have also improved. The body fat content indicators have changed significantly. It can be seen from this experimental study that aerobic exercise can help obese college students improve their sports motivation, ease their psychological problems, improve their mental health, help them stimulate their enthusiasm for sports, improve the effect of physical exercise, and thus develop healthy learning habits and living habits.

ACKNOWLEDGEMENTS

This paper was supported by China National Social Science Fund Project: Typical Cases, Model Refinement and Promotion Path Research of the Integrated Development of Sports and Medicine in my country (21BTY090).

All authors declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: The author has completed the writing of the article or the critical review of its knowledge content. This paper can be used as the final draft of the manuscript. Every author has made an important contribution to this manuscript. Lili Zhang and Hao Duan: writing and execution. Hongyi Du and Xiangzhi Wu: data analysis and article reviews.

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