

# VOLLEYBALL FITNESS IN COLLEGE STUDENTS DURING THE EPIDEMIC

APTIDÃO FÍSICA DO VOLEIBOL EM ESTUDANTES UNIVERSITÁRIOS DURANTE A EPIDEMIA

APTITUD FÍSICA PARA EL VOLEIBOL EN ESTUDIANTES UNIVERSITARIOS DURANTE LA EPIDEMIA



ORIGINAL ARTICLE  
ARTIGO ORIGINAL  
ARTÍCULO ORIGINAL

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## ABSTRACT

**Introduction:** The COVID-19 epidemic has negatively impacted physical education teaching at colleges and universities, including volleyball teaching, lacking face-to-face teacher feedback. **Objective:** Study the impacts of physical education teaching during the pandemic on college students' physical fitness. **Methods:** The experiment was conducted in a controlled fashion where the male and female experimental classes used a combination of face-to-face and remote physical education teaching methods, while the male and female control classes used a fully remote approach. The experiment was conducted according to the curricular arrangement of colleges and universities, with a total duration of 24 class hours. **Results:** The average volleyball score of the experimental class before was 41.78 points, rising to 46.55 points. The volleyball score was 78.64 points in 24 hours of class time. The average volleyball score of the control class before the experiment was 41.25 points, rising to 45.44 points, with a final test score of 63.25 points, significantly lower than the experimental class. **Conclusion:** The research results show the composite physical education teaching method can adjust teaching methods according to the changing epidemic situation and allow students to receive outdoor training. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

**Keywords:** COVID-19; Physical Education and Training; Volleyball.

## RESUMO

**Introdução:** A situação da epidemia da COVID-19 impactou negativamente no ensino de educação física nas faculdades e universidades, incluindo o ensino do voleibol, carente de um retorno presencial dos professores. **Objetivo:** Estudar os impactos do ensino de educação física durante o período de pandemia sobre a aptidão física dos estudantes universitários. **Métodos:** A experiência foi conduzida de forma controlada, na qual a classe experimental masculina e a classe experimental feminina utilizaram uma combinação de métodos de ensino de educação física presencial e remota, enquanto as classes de controle masculino e feminino utilizaram uma abordagem totalmente remota. O experimento foi conduzido de acordo com a disposição curricular das faculdades e universidades, com uma duração total de 24 horas/aula. **Resultados:** A pontuação média de vôlei da classe experimental antes foi de 41,78 pontos, elevando-se para 46,55 pontos. A pontuação no voleibol foi de 78,64 pontos em 24 horas de aula. A pontuação média do voleibol da classe de controle antes do experimento foi de 41,25 pontos, subindo para 45,44 pontos, com pontuação final do teste em 63,25 pontos, significativamente menor do que a da classe experimental. **Conclusão:** Os resultados da pesquisa mostram que a aplicação do método de ensino de educação física composta pode não só ajustar os métodos de ensino de acordo com as mudanças da situação epidêmica, como também pode permitir que os estudantes recebam um treinamento ao ar livre. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

**Descritores:** COVID-19; Educação Física e Treinamento; Voleibol.

## RESUMEN

**Introducción:** La situación de la epidemia del COVID-19 repercutió negativamente en la enseñanza de la educación física en colegios y universidades, incluida la enseñanza del voleibol, al carecer de información presencial por parte de los profesores. **Objetivo:** Estudiar las repercusiones de la enseñanza de la educación física durante el periodo de pandemia en la forma física de los estudiantes universitarios. **Métodos:** El experimento se llevó a cabo de forma controlada, en el que la clase experimental masculina y femenina utilizó una combinación de métodos de enseñanza de la educación física presenciales y a distancia, mientras que las clases de control masculina y femenina utilizaron un enfoque totalmente a distancia. El experimento se llevó a cabo de acuerdo con la organización curricular de los institutos y universidades, con una duración total de 24 horas/clase. **Resultados:** La puntuación media en voleibol de la clase experimental antes era de 41,78 puntos, y aumentó a 46,55 puntos. La puntuación del voleibol fue de 78,64 puntos en 24 horas de clase. La puntuación media en voleibol de la clase de control antes del experimento era de 41,25 puntos, que aumentó a 45,44 puntos, con una puntuación final en el examen de 63,25 puntos, significativamente inferior a la de la clase experimental. **Conclusión:** Los resultados de la investigación muestran que la aplicación del método compuesto de enseñanza de la educación física no sólo puede ajustar



**Descriptores:** COVID-19; Educación y Entrenamiento Físico; Voleibol.

INTRODUCTION

At this stage, the global epidemic has brought some difficulties to the physical education teaching in colleges and universities.<sup>1</sup> Physical education curriculum is affected. How to solve the current problems of physical education teaching under the influence of the epidemic situation is an urgent task for physical education teaching in colleges and universities.<sup>2</sup> Moreover, with the popularization of sports science knowledge, student groups are no longer satisfied with sports experience at the current stage, but pursue higher sports experience.<sup>3</sup> The concept of high-quality participation in sports has been recognized by student groups. Volleyball is a popular sport in colleges and universities. Students are also looking for ways to exercise that suit them. Therefore, physical education in colleges and universities is a crucial link.<sup>4</sup> In the teaching process, ensure that the student group has sufficient reserves of sports related knowledge, skilled sports skills, mature sports awareness and health awareness. These are the main goals of physical education in colleges and universities.<sup>5</sup> It is helpful for students' personal physical and mental development. Under the conventional volleyball sports mode, the requirements for facilities such as venues and equipment are not high. And the participation of volleyball in college sports is very high. However, the proportion of high-quality sports experience is very low.<sup>6</sup> Because there is no uniform standard for the technical guidance and ability improvement of volleyball courses in colleges and universities. As a result, the technical level and sports consciousness of student groups are uneven.<sup>7</sup> Some students, because of their high love for volleyball, will actively learn relevant sports knowledge and have mature technical ability. However, most of the students are unable to carry out high-quality sports, which brings some difficulties to the volleyball teaching in colleges and universities.<sup>8</sup> The main reason is that if students are not students of sports colleges, it is difficult to receive special volleyball training. Therefore, colleges and universities should improve the course teaching in view of the main problems existing at this stage.<sup>9</sup> By means of compound teaching, students' sports ability, sports theoretical knowledge and sports awareness can be improved. The main content of teaching at this stage is to provide targeted guidance to students' volleyball events.

METHOD

Selection of research objects

In order to more systematically study the effect of compound sports teaching on college students' volleyball service skills, and reduce the deviation of research results caused by gender interference factors. The study and all the participants were reviewed and approved by Ethics Committee of Jiangsu University (NO.18JSUN-00745). In this paper, both male and female college students are selected as research objects. According to the form of students' course selection, the article sets up two kinds of selection situations: experimental class and control class, which require students to be healthy, and gives a detailed description in the course description, describing the situation of course setting, the goal of course research, and the teaching and learning activities that students need to carry out after course selection. After fully understanding the relevant contents, students can choose courses independently, which are divided into male experimental class, female experimental class,

male control class and female control class. Each class is set with 30 students, 120 subjects in total. The specific results are shown in Table 1. It can be seen from the list in Table 1 that there is little difference between the experimental class and the control class in height, weight and age. The calculation result  $P>0.05$  indicates that there is no significant attribute difference. This shows that the selection of experimental objects will not interfere with the experimental results.

Implementation of 24 class hours of volleyball teaching

This experiment adopts the method of controlled experiment, in which the male experimental class and the female experimental class adopt the combination of online and offline sports teaching methods. Students not only carry out relevant theoretical teaching online, but also have professional teachers to train and guide online and offline when the epidemic is not serious. The male control class and the female control class are all online. The overall course is all online. The students' learning is the teacher's live teaching and recorded video playback. The homework and exam are handed in through live broadcast and recorded video.

Each of the two teaching methods has its own advantages and disadvantages. Even online teaching, students also have volleyball as a training prop, and online teaching video resources can be watched repeatedly. Students can watch, learn, and adjust the overall action and a specific action repeatedly according to their own actual conditions, and the teaching video recorded by teachers is very standard. No matter how many times it is repeated, there will be no mistakes. Therefore, the online advantages in the teaching of movement skills are more obvious. However, online teaching lacks wide field practice, so students cannot really train on the volleyball court, and can only practice in open environments such as indoor or balcony courtyard. The advantage of offline teaching in compound volleyball teaching is that students can train on the professional volleyball court and PE teachers can correct students' teaching actions. However, the disadvantages of offline teaching are also very obvious. There are 30 students in a class. Although PE teachers will always observe each student's situation in a class, they pay limited attention to each student. After a class, each student may only have several opportunities to correct. Therefore, students' attention in offline teaching is not enough, and there are certain deviations in details.

The experiment lasted for 24 class hours. During the experiment, all the students showed full attendance by punching cards. There was no truancy or absence due to injury or illness. After 24 class hours of teaching and training, the criteria for judging the relevant indicators of volleyball, service accuracy and the total score of classroom volleyball tests are to study the differences between compound teaching and online teaching on volleyball teaching service skills.

Table 1. Basic characteristics of the two groups of subjects.

| Gender | Test index  | Experimental class | Control class | t       | P      |
|--------|-------------|--------------------|---------------|---------|--------|
| Male   | Age (age)   | 18.77 ±1.404       | 18.60 ±1.342  | -0.4805 | 0.6333 |
|        | Height (cm) | 172.39 ±2.451      | 171.77 ±3.442 | 1.5339  | 0.1358 |
|        | Weight (kg) | 57.25 ±4.466       | 61.51 ±5.375  | -1.8359 | 0.0820 |
| Female | Age (age)   | 18.84 ±1.350       | 18.66 ±0.411  | 0.4715  | 0.6321 |
|        | Height (cm) | 163.57 ±4.119      | 163.41 ±4.289 | 0.0000  | 0.9127 |
|        | Weight (kg) | 50.10 ±3.939       | 50.66 ±4.708  | -0.1668 | 0.8668 |

## RESULTS

### Changes in physical test scores related to volleyball

In this section, some physical indicators related to volleyball are selected as the criteria for preliminary judgment. In the actual sports volleyball practice, students need to complete fast running, short-term transition running, jumping serve or receiving in the volleyball court according to the actual situation of volleyball, so the relevant physical indicators have a greater impact on volleyball performance. In the context of the COVID-19 epidemic, college students' lack of outdoor exercise will easily lead to a decline in physical fitness. Physical education has become one of the few sports training opportunities for them. Therefore, this section selects three indicators, namely, 30 meter run, five meter three direction and standing long jump, to measure, and discusses the impact of compound physical education teaching and online physical education teaching on students' physique and volleyball performance. The changes of relevant test scores of the men's group are shown in Table 2.

The changes in the relevant test scores of the women's group are shown in Table 3. It can be seen from the comprehensive comparison between Table 2 and Table 3 that, in terms of the changes in the physical test results, the optimization effect of the physical test in the experimental class and the control class is not obvious in the same sex, but only slightly plays a role in optimization, and the effect of the experimental class, that is, the compound physical education teaching class, is slightly higher than that of the control class. After analyzing this reason, the author believes that under the influence of the COVID-19 epidemic situation, the flow of people during the closure of the school is to be controlled, Therefore, many students do not have too many opportunities for outdoor sports. Whether boys or girls, their sports form has changed from outdoor to balcony, indoor and so on. At present, indoor sports, such as yoga and aerobics, which cover a small area, are popular. Therefore, although the design of physical education courses has not caused a great decline in students' physique due to the impact of the epidemic, it cannot offset the negative impact of the epidemic, so the optimization effect is not good enough.

### Changes in service success rate and volleyball performance

This paper studies the influence of compound physical education teaching on volleyball service skills. The two teaching methods have their own advantages. The compound physical education teaching can get more intuitive teaching from physical education teachers, and facilitate students to find skills problems that they have not found as soon as possible. Online physical education can repeatedly learn details by watching videos for many times. The changes of service accuracy and service performance of both are shown in this section.

When analyzing the change of service accuracy, in order to more objectively analyze the students' service situation and reduce the impact of service errors, it is necessary to increase the number of service, so as to facilitate the calculation. In order to save time, the data should not be too large, so this paper selects 30 service attempts as the total number of service attempts, and each student performs 30 service movements to calculate the number of successful service. The relevant tests are conducted in groups of two people, counting each other and every two class hours. The obtained data are summarized and their average values are calculated. The results are summarized as shown in Figure 1. The experimental class includes male experimental class and female experimental class, and the control class includes male control class and female control class. Before the beginning of volleyball teaching, there was little difference between the experimental class and the control class in the number of successful serves, which was about 4 times. With the course, the experimental class and the control class showed an increase in the number of successful serves, which proved that online teaching and compound physical education teaching had played a good role in teaching volleyball service skills.

The most intuitive presentation of the judgment of teaching effect is the teaching results of physical education courses. Therefore, this paper conducts online and offline volleyball tests on students at the 0, 8, 16 and 24 hours of volleyball teaching, and analyzes their scores. It can be seen from Figure 2 that the average volleyball score of the experimental class before the start of the course was 41.78 points. After eight weeks of teaching, its volleyball score rose to 46.55 points, 67.45 points at 16 class hours and 78.64 points at 24 class hours, indicating that its volleyball score has been rising. The volleyball score of the control class before the experiment was 41.25 points, which was little different from that of the

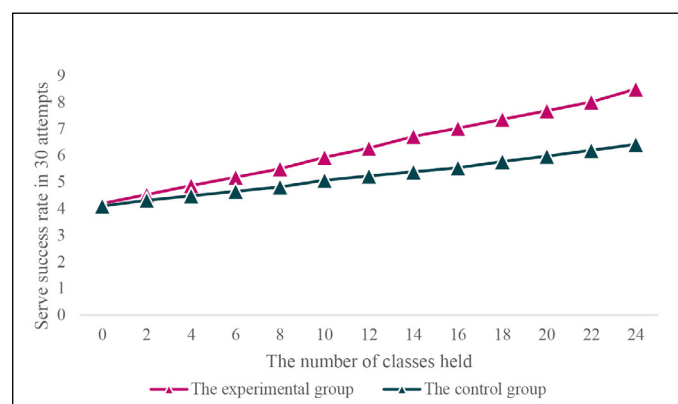


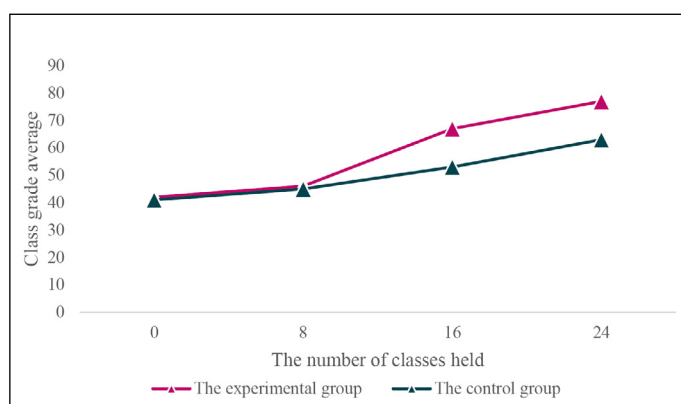
Figure 1. Change of service accuracy between experimental class and control class.

Table 2. Changes in relevant test scores of men's group.

| Gender             | 0 class hour |                                     |                        | 24 class hours |                                     |                        |
|--------------------|--------------|-------------------------------------|------------------------|----------------|-------------------------------------|------------------------|
| Test index         | 30m (s)      | Five meters in three directions (s) | Standing long jump (m) | 30m (s)        | Five meters in three directions (s) | Standing long jump (m) |
| Experimental class | 5.46 ±1.321  | 11.68 ±0.500                        | 2.28 ±1.161            | 5.32 ±0.326    | 11.76 ±0.542                        | 2.32 ±0.162            |
| Control class      | 5.72 ±1.422  | 11.69 ±1.713                        | 2.34 ±1.190            | 5.14 ±0.194    | 11.24 ±0.300                        | 2.44 ±0.153            |
| t                  | -1.3337      | 0.2736                              | -0.5180                | 2.1531         | 3.1594                              | -2.3456                |
| P                  | 0.2005       | 0.7849                              | 0.6085                 | 0.0419         | 0.0051                              | 0.0250                 |

Table 3. Changes in relevant test scores of women's group.

| Gender             | 0 class hour |                                     |                        | 24 class hours |                                     |                        |
|--------------------|--------------|-------------------------------------|------------------------|----------------|-------------------------------------|------------------------|
| Test index         | 30m (s)      | Five meters in three directions (s) | Standing long jump (m) | 30m (s)        | Five meters in three directions (s) | Standing long jump (m) |
| Experimental class | 6.47 ±1.814  | 12.98 ±0.726                        | 1.72 ±1.139            | 6.02 ±0.605    | 12.73 ±1.642                        | 1.82 ±0.151            |
| Control class      | 6.07 ±0.741  | 12.84 ±1.061                        | 1.81 ±0.188            | 5.92 ±1.294    | 11.99 ±0.799                        | 1.90 ±0.139            |
| t                  | 1.6820       | 0.6711                              | -0.9783                | 3.9477         | 2.7841                              | -2.4012                |
| P                  | 0.1094       | 0.5063                              | 0.3395                 | 0.0010         | 0.0101                              | 0.0220                 |



**Figure 2.** Changes of volleyball scores in experimental class and control class.

experimental class. After eight weeks of teaching, it was 45.44 points. Although it was slightly lower than that of the experimental class, the two classes still showed a level state. By the 16th class hour, the volleyball score of the control class was 53.57 points. At this time, there was a significant gap between the control class and the experimental class. From the 16th class hour to the 24th class hour, the improvement rate of the two classes was again the same. The final test score of the control class was 63.25, significantly lower than that of the experimental class.

## DISCUSSION

Under the influence of epidemic situation, colleges and universities should adopt the method of compound physical education teaching. The first is the combination of teaching modes. Relevant teaching shall be carried out by combining online and offline teaching. On the basis of outdoor course teaching, online teaching is adopted when the epidemic is serious. The combination of online and offline teaching mode can maintain the sports interest of college students, which is beneficial to the physical and mental development of student groups. Secondly,

the combination of teaching content is equally important. Due to the differences among individual students, teachers should design different teaching contents and training plans according to the conditions of different individuals. Make students' individual weak links targeted. The compound teaching content can effectively improve the sports experience of student groups. Then it is to guide students' technical ability and teach sports related theories. The method of compound teaching course can enable students to get all-round improvement in the project. On the premise of paying attention to technical ability, it is equally important for students to reserve mature theoretical knowledge. When reaching a certain reserve of sports theoretical knowledge, students can obtain high-quality sports experience.

## CONCLUSION

The COVID-19 epidemic situation has brought a lot of adverse effects to college physical education teaching, especially the volleyball teaching that requires teachers to correct their actions. In the interview and investigation of students, compound physical education teaching and online physical education teaching have their own advantages, and this research is to discuss them more rigorously. The research results show that the application of compound physical education teaching method can not only adjust teaching methods in time according to the changes of the epidemic situation, but also enable students to get outdoor teaching training as much as possible. We can also use the experience of physical education teachers to correct students' actions in time to ensure the accuracy and solidity of their skills. Therefore, colleges and universities should adopt compound physical education teaching according to the epidemic situation to give students better learning experience and learning effect.

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

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**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. Ge Yuhui and Song Qingyao: writing and execution. Zheng Hua and Yin Juan: data analysis and article reviews.

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