International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China

Ling Xiao Han[1], Phichayavee Panurushhthanon[2]
Srinakharinwirot University, Thailand
E-mail: 690432810@qq.com, ORCID ID: https://orcid.org/0009-0001-2072-8694
E-mail: nantanak@g.swu.ac.th, ORCID ID: https://orcid.org/0009-0005-4557-749X

Received 26/06/2024 Revised 10/07/2024 Accepted 10/08/2024

Abstract

Background and Aim: The emergence of the novel coronavirus epidemic at the end of 2019 has prompted relatively strict closed management measures across the country, especially in places with high population density such as universities. This closed management mode hurts the physical and mental health of teenagers in colleges and universities. Physical activity plays an important role in improving adolescents' physical and psychological health, enhancing their physical health, and alleviating anxiety. The objectives of this study included: the exercise situation of adolescents during the epidemic; Factors affecting the physical exercise of adolescents during the epidemic; The relationship between adolescent sports behavior during the epidemic; and The sports behavior of Zhoukou adolescents after the epidemic.

Materials and Methods: The Taro Yamane formula was used to select 380 college students aged 18-24 from the research population for questionnaire adjustment. Random simple sampling was used. The statistical data used include mean value, standard deviation, T-test statistics, etc.

Results: The weekly exercise frequency and exercise time levels of most respondents were low during the epidemic period, and improved after the epidemic ended. In terms of the purpose of exercise, most people exercise for health; The average level of female respondents in three aspects of exercise knowledge, attitude, and perception is higher than that of male respondents.

Conclusion: During the COVID-19 epidemic, the exercise behavior of adolescents was affected to some extent, and the exercise frequency decreased compared with the past, but after the epidemic, the exercise frequency increased again. Most of the adolescents did an exercise for health, and the average level of female samples in knowledge, attitude, and perception was higher than that of male samples. The analysis of the survey results will help government departments at all levels and university management departments to formulate physical exercise and mental health guidance according to the epidemic situation. The analysis of the survey results will help government departments at all levels and university management departments to formulate physical exercise and mental health guidance according to the epidemic situation.

Keywords: The COVID-19 Pandemic; Adolescence; Exercise behavior; Knowledge; Attitude; Perception

Introduction

On December 1, 2019, the first suspected case of COVID-19 was admitted to Jinyintan Hospital in Wuhan, Hubei Province, China. Since then, major hospitals in Wuhan have continued to receive patients with pneumonia of unknown cause. On December 29, the Wuhan Municipal Health Commission began an epidemiological investigation. On January 8, 2020, the expert group of the National Health Commission confirmed that the source of the outbreak was a new coronavirus. (Fan 2020) At the end of January 2020, the World Health Organization designated COVID-19 a global public health emergency. Emergency prevention and control of public health incidents have been launched across the country. Businesses were closed, shops closed, schools closed and people were kept at home. According to the relevant notice of the Ministry of Education and the actual need for epidemic prevention and control, major universities in China have taken measures such as postponing the opening of the semester and online teaching. After the epidemic was effectively controlled, all walks of life resumed work and production in an orderly manner, and colleges and universities around the country began to reopen at the wrong peak.

As the prevention and control of the novel coronavirus epidemic have entered a stage of normalization, many universities around the country have adopted closed management to ensure the life, health, and safety of returning students. Due to the phenomenon of the epidemic rebound that still appears from time to time across the country and strict closed management measures, adolescents have different degrees of negative emotions, among which anxiety and depression are more prominent. Physical activity

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

plays an important role in improving the mental health of adolescents and is of great significance in improving the quality of life of adolescents. (Zhao, 2022)

The importance of this research

After the outbreak of COVID-19, the government, schools, and families have done little to improve the mental and physical health of college students. This study uses a questionnaire survey to learn more about the physical activity of young people during the COVID-19 epidemic, and their sports behavior may have a certain relationship with their knowledge, attitude, and perception. The analysis of the survey results will help government departments at all levels and university management departments to formulate physical exercise and mental health guidance according to the epidemic situation. At the same time, the method of movement is economical and easy to learn.

Objectives

1. Exercise of adolescents during the epidemic.
2. Factors affecting adolescents' physical exercise during the epidemic.
3. The relationship between adolescent sports behavior during the epidemic.
4. Exercise behavior of Zhoukou adolescents after the epidemic.

Literature review

Definition of exercise behavior

Physical exercise is an important embodiment of physical behavior and an important way to improve physical quality. Exercise is a unique and fundamental way of sports. It is the central link for people to engage in sports. It is also an important symbol of the difference between sports and other behaviors. To realize the fundamental purpose of sports and meet the needs of the developing society and individuals, it is mainly through various physical exercises to achieve, and all other physical activities are to serve the exercise behavior in the final analysis. Lotan et al. (2005) defined physical exercise as physical activity directly related to physical health and well-being in their study on physical exercise and physical health. In the study on the impact of physical exercise on cardiorespiratory endurance.

Benefits of Exercise

Wang (2012) believes that as a health behavior, physical exercise can improve people's health levels and reduce the impact of health inequality brought by social and economic status.

Li et al. (2023) believe that physical exercise can inhibit the number of medical visits of residents and is more effective in improving health inequality.

Bowen et al (2013) believe that physical exercise, as an auxiliary psychotherapy, can have a very good effect on improving mental health. Physical exercise can help maintain emotional stability and effectively relieve anxiety and depression.

In terms of sports psychology, a large number of clinical and animal studies have shown that physical exercise has a good effect on cognitive function, especially aerobic exercise can affect the development of children's cognitive ability, thus affecting children's self-control. Schondube's (2017) research shows that regular exercise can improve their self-control ability and reduce their impulsivity. In terms of sports human science, DeSire et al. (2021) adopted a controlled experiment method to explore the effectiveness of physical exercise in treating patients with knee osteoarthritis. Lai et al (1995) took 110 subjects aged 50-78 years old from a community in Europe as the control group and the experimental group, and conducted a Taijiquan intervention study on the experimental group. The results showed that the cardiopulmonary function of the elderly who regularly participated in Taijiquan exercise was significantly better than that of those who did not regularly exercise.

Definition of adolescents

Adolescence is a transitional stage of physical and mental development that usually occurs between adolescence and legal adulthood. Adolescents are generally defined as those between the ages of 10 and

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

24, but due to physical, psychological, or cultural performance may begin earlier and end later, with cognitive development (especially in the prefrontal cortex, which is responsible for impulse control) and physical size development (especially in males) continuing well into their 20s.

A comprehensive understanding of adolescents requires a variety of perspectives, including psychology, biology, neurocognitive science, history, sociology, education, and anthropology. From all perspectives, adolescents are generally considered to be the transition period between children and adulthood, and the cultural purpose is for children to prepare for the role of adults. This is a period of multiple transitions in the areas of education, training, employment/unemployment, and the transition from one living environment to another.

Exercise status of adolescents

Wu (2020) found that under the influence of subjective and objective factors such as traditional educational values and sports facilities, the physical exercise education of young people is not paid attention to, their awareness of physical exercise is weak, and their willingness to exercise cannot be satisfied, which affects the healthy physical development of young people. For young people at school age, the basic way to improve their physique and build a strong body is to participate in sports. At the same time, sports must follow the law of physical development, which requires gradual and individualized teaching, scientific planning and appropriate intensity, teaching scientific sports knowledge, and shaping good exercise habits and sports values. Physical exercise needs to consume a certain amount of physical strength, and sometimes it will produce a variety of discomforts such as fatigue, muscle soreness, and so on. A large number of surveys have proved that today's adolescents generally lack the spirit of hard work, especially the only child. The special breeding environment caused them to be afraid of suffering, afraid of fatigue, afraid of dirty, delicate, lazy, seeking comfort in life, and other bad psychological qualities, in the absence of strict rules, they will not consciously take the initiative to participate in physical exercise.

Tang et al (2020) found that most adolescents in Heilongjiang Province can regularly participate in out-of-school physical exercise, and the exercise time and intensity are significantly better than in-school physical education and extracurricular physical exercise. Traditional sports such as long-distance running, table tennis, badminton, skipping rope, shuttlecock, basketball, swimming, and football are the main sports to participate in off-campus physical training, and few rely on professional coaches to guide sports skills. Participation in physical exercise is mainly concentrated in the small intensity of physical fitness and games and entertainment.

Factors influencing adolescents' exercise

Nowadays, there are still some deviations in the educational concept of parents. Most parents only care about the learning of adolescents but do not pay attention to their physical health, which is one of the important factors causing the decline of the physical health of adolescents in our country. Liu and Zhao (2022) believe that the earliest education for adolescents comes from the family, and the importance parents attach to sports determines whether adolescents can have a healthy physique to some extent.

The novel coronavirus

Novel coronavirus pneumonia (COVID-19) is a newly emerging respiratory infectious disease caused by SARS-CoV-2. Its main clinical manifestations are fever, dry cough, and fatigue. A small number of patients may have no obvious clinical symptoms after infection with the novel coronavirus. Different clinical types have different manifestations [1]. The global outbreak of COVID-19, which began in late 2019, poses a significant threat to public health. With the emergence of vaccines against the novel coronavirus and active and effective human prevention measures, the human immune barrier has been extensively formed, making the novel coronavirus pneumonia in different countries and regions have been effectively controlled. However, the characteristics of strong infectivity, rapid spread, and diverse transmission routes limit people's gathering and travel, and to a certain extent, affect the public's physical exercise behavior. On 30 January 2020, COVID-19 was identified as a global public health emergency.

To prevent the spread of the virus to the greatest extent possible, China has adopted a series of prevention and control measures, such as close contact with patients for isolation treatment, medical

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

supervision, and home isolation, in the isolation state, due to the interruption of travel plans, various social media lack of excessive information overload, such as panic buying of necessities, and so on.

Threads must be regulated and managed. Of the symptoms associated with an individual's mental health, anxiety is the most common. The suddenness and unpredictability of the situation may trigger mass psychological stress reactions, resulting in public panic or anxiety. The novel coronavirus epidemic is sudden and long-term, and its various unknowable and uncontrollable factors will cause excessive fear, worry, and anxiety among the public, which will not only cause physical discomfort but also cause mental damage to people.

Many empirical studies have shown that physical activity, as an adjunct treatment for mild to moderate mental disorders, plays an important role in the alleviation and improvement of depression and anxiety. Physical exercise can not only boost immunity but also promote mental health. It can improve the efficiency of health services through the integration of resources and mutual coordination between sports and health systems. Dong's (2004) research during the SARS epidemic also showed that exercise can significantly reduce the tension and anxiety caused by sudden public crises. During the COVID-19 epidemic, regular and quantitative physical exercise is also recommended as an important means to regulate individual mental health.

Tian (2021) found that physical exercise during the epidemic situation was more conducive to higher friendship quality. The exercise enthusiasm of exercisers has been improved, the cognition of physical exercise has been greatly changed, and the purpose of exercise has been strengthened. Taking part in physical exercise can make exercisers have more social communication and improve their communication ability continuously so that physical exercise can bring good communication and interaction and better promote the improvement of the quality of sports friendship. The mental state of the epidemic is prone to emotions, anxiety, and other bad emotions. Through the good atmosphere, culture, and happy experience brought by physical exercise, the bad emotions begin to slowly dilute, and the quality of sports friendship is constantly strengthened and improved.

A study by Zhu and Feng (2022) found a significant increase in the proportion of overweight and obese adolescents in cities. The school courses are taught online, and the students face large electronic screens such as TV, computer, mobile phone, and tablets for a long time, coupled with heavy homework after school, the detection rate of poor vision continues to rise, and the problems of scoliosis and obesity become more and more serious. Overall physical fitness level index decreased. During the epidemic, static activities of adolescents increased, outdoor activities and physical activities decreased significantly, speed, endurance, and explosive power decreased significantly, physical coordination decreased, and physical function, especially cardiorespiratory endurance level decreased. Related medical research shows that breathing, obesity, and the decline of cardiovascular function during adolescence are the causes of fatal diseases such as diabetes and coronary heart disease after middle age. Affected by the epidemic, the economic recession, the narrowed social range, the depressed family atmosphere, and the epidemic rumors have caused a certain negative impact on the psychology of young people. They do not eat, sleep, study, exercise, communicate, and often conflict with their families, and some young people have psychological problems such as fear, anxiety, insomnia, depression, and somatization.

Conceptual Framework

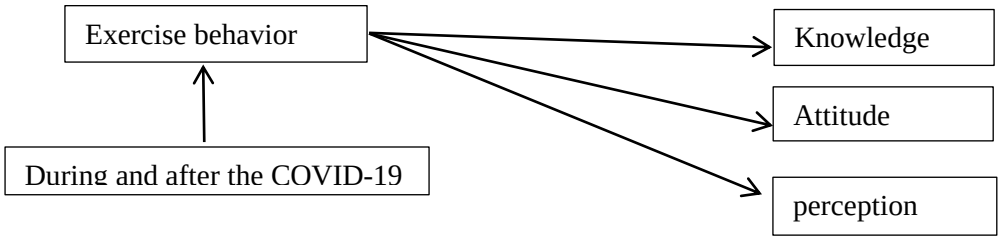

Figure 1 Conceptual Framework

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Methodology

Study scope and sample: 380 students aged 18-24 were selected from a total of 250,41 undergraduate students in Zhoukou, Henan Province, China. We used an online questionnaire to investigate adolescents' exercise behavior during the COVID-19 pandemic. The questionnaire consists of four parts: the first part is the general information questionnaire. The second part is the questionnaire on youth sports knowledge during the COVID-19 epidemic. The third part is the survey form of youth sports attitudes during the COVID-19 epidemic. The fourth part is the survey form on youth sports awareness during the COVID-19 epidemic. The obtained data were sorted out, statistical analysis was carried out using computer programs, and the frequency and percentage of variables (gender, age, exercise days, exercise duration) were listed; The mean value, standard deviation, data percentage, and F-test of the questionnaire on sports knowledge behavior, behavior attitude and cognitive awareness of adolescents during the COVID-19 epidemic were analyzed. Find out the relationship between knowledge, attitude, and perception. Through the analysis, the exercise situation of adolescents during the COVID-19 pandemic was obtained to answer the research hypothesis.

Results

After sorting out and analyzing the data collected by the questionnaire, the following tables and conclusions are obtained.

Table 1 Frequency and percentage of basic information

Basic information	variable	frequency	%
sex	male	238	62.467
	female	143	37.533
age	Less than 18 years old	5	1.31
	18-24 years old	372	97.64
	Over 24 years old	4	1.05
Days of exercise during the epidemic	Less than 3 days	284	74.541
	3-5 days	72	18.898
	More than 5 days	25	6.562
Time for each exercise	Less than 30 minutes	277	72.703
	More than 30 minutes	104	27.297
Days of exercise per week after the pandemic	Less than 3 days	201	52.756
	3-5 days	136	35.696
	More than 5 days	44	11.549

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

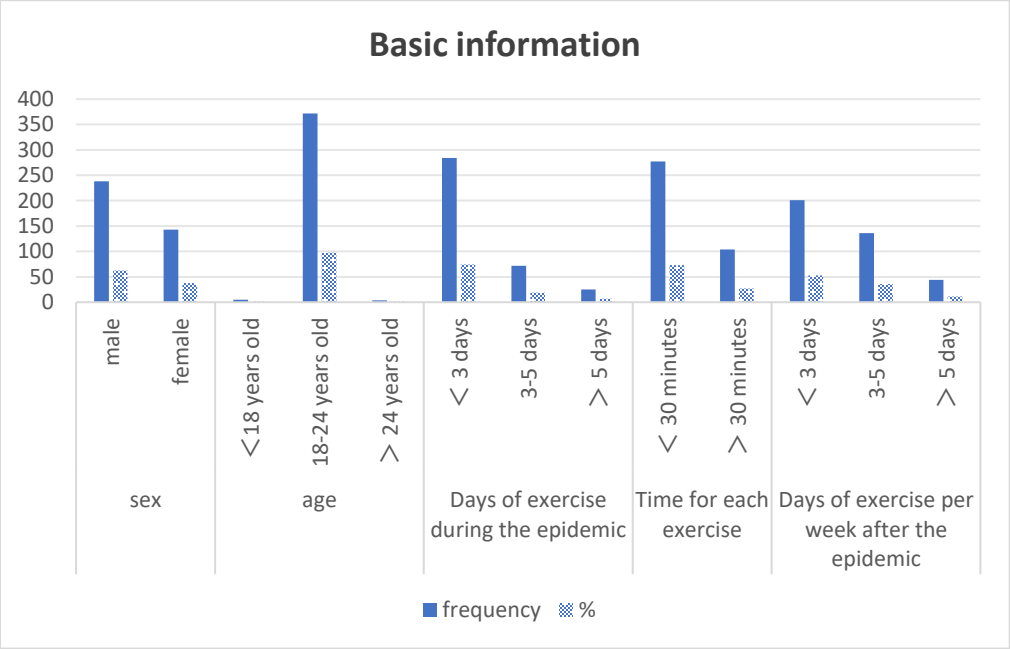

Figure 2 Frequency and percentage of basic information

Table 1 and Figure 1 show the basic information. The number of male samples is 238, accounting for 62.47%, and the number of female samples is 143, accounting for 37.53%. There were 5 people under the age of 18, accounting for 1.31%; 372 people between the ages of 18 and 24, accounting for 97.64%; 4 people over the age of 24, accounting for 1.05%; During the COVID-19 epidemic, 284 people exercised less than 3 days per week, accounting for 74.54%; 72 people exercised 3-5 days, accounting for 18.90%; 25 people exercised more than 5 days, accounting for 6.56%; Among the samples, 277 people exercised for less than 30 minutes each time, accounting for 72.70%, and 104 people exercised for more than 30 minutes each time, accounting for 27.30%. After the COVID-19 epidemic, 201 people exercised less than 3 days per week, accounting for 52.76%; 136 people exercised 3-5 days per week, accounting for 35.70; 44 people exercised more than 5 days per week, accounting for 11.54%.

Table 2 Frequency values and percentages of motion purposes

Purpose of exercise	**frequency**	**%**
For health	238	62.467
For fun	32	8.399
Keep fit	57	14.961
For competition	4	1.05
Other (or no exercise)	50	13.123

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

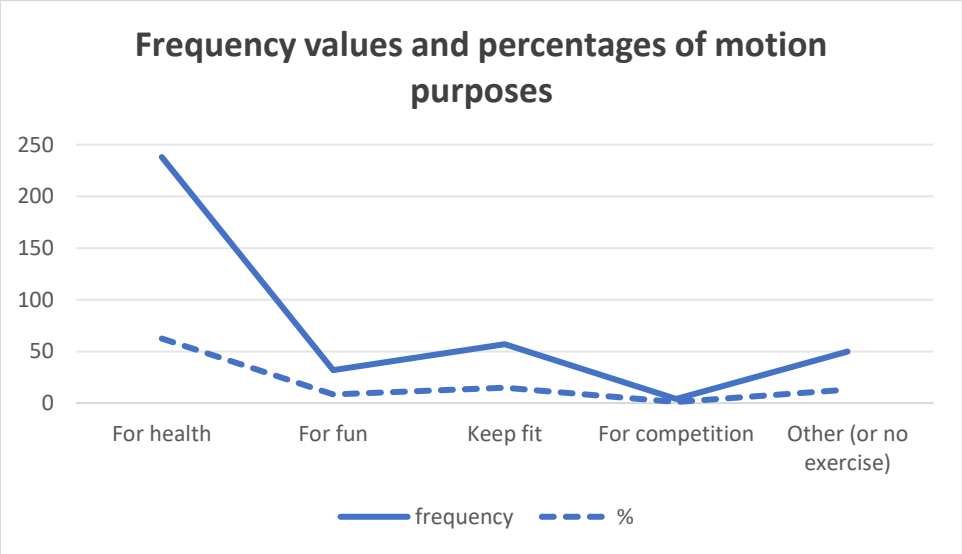

Figure 3 Frequency values and percentages of moving objects

Table 2 and Figure 2 show that the number of healthy people in the sample is 238, accounting for 62.47%, of exercise. For fun, 32 people, accounting for 8.40%; The number of people who kept their body shape was 57, accounting for 14.96%; The number of competitors was 4, accounting for 1.05%; The number of others (or no exercise) was 50, accounting for 13.12%.

Table 3 Comparison of exercise behaviors between genders

Variables	**sex**	**Mean**	**S.D.**	**t**	**p**
knowledge	male	1.431	0.205	-2.687	0.008**
	female	1.481	0.156		
Attitude	male	2.712	0.593	-2.017	0.044*
	female	2.813	0.382		
perception	male	2.787	0.661	-2.826	0.005**
	female	2.957	0.503		

*p＜0.05

The data in Table 3 shows that the t-test (independent sample t-test) is used to study the differences of gender in knowledge, attitude, and perception. As can be seen from the above table, samples of different genders show significant significance in knowledge, attitude, and perception ($p<0.05$), which means that samples of different genders have differences in knowledge, attitude, and perception. Specific analysis shows that:

Gender showed a level of significance for the knowledge level of exercise ($t=-2.687$, $p=0.008$), and the comparison difference showed that the average value of males (1.43) was significantly lower than that of females (1.48).

Gender's attitude towards exercise showed a 0.05 level significance ($t=-2.017$, $p=0.044$), and the comparison difference showed that the average value of males (2.71) was significantly lower than that of females (2.81).

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Gender's perceived level of exercise showed a level significance of 0.01 (t=-2.826, p=0.005). Compared with the difference, the average value of males (2.79) was significantly lower than that of females (2.96).

Table 4 Comparison of attitude behavior and behavior awareness exercise behavior

Variables		SS	df	MS	F	p
knowledge	Between groups	0.124	4	0.031	0.864	0.486
	Within the group	13.508	376	0.036		
	total	13.632	380			
Attitude	Between groups	2.969	4	0.742	2.737	0.029
	Within the group	101.983	376	0.271		
	total	104.952	380			
perception	Between groups	7.081	4	1.77	4.931	0.001
	Within the group	134.991	376	0.359		
	total	142.072	380			

Analysis of Variance (ANOVA) was used to study the differences in knowledge, attitude, and perception of sports purposes. From Table 4: Samples for different sports purposes do not show significant knowledge ($p>0.05$), which means that samples for different sports purposes all show consistency in knowledge, and there is no difference, so post-test analysis is not necessary. The samples for exercise purposes showed significant effects on attitude and perception ($p<0.05$), indicating that samples for different exercise purposes had differences in attitude and perception, so post-test analysis could be carried out specifically.

Table 5 Comparison of exercise behaviors in attitude and perception

Variables	Purpose （I）	Purpose （J）	M.D (I-J)	p
Attitude	For health	For fun	-0.121	0.219
		Keep fit	0.052	0.501
		For competition	0.761	0.004**
		No exercise	0.041	0.617
	For fun	Keep fit	0.172	0.135
		For competition	0.881	0.002**
		No exercise	0.161	0.172
	Keep fit	For competition	0.709	0.009**
		No exercise	-0.011	0.911
	For competition	No exercise	-0.72	0.008**
perception	For health	For fun	0.022	0.844
		Keep fit	0.084	0.34
		For competition	0.916	0.003**

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Variables	Purpose（I）	Purpose（J）	M.D (I-J)	p
		No exercise	0.314	0.001**
	For fun	Keep fit	0.062	0.639
		For competition	0.894	0.005**
		No exercise	0.292	0.032*
	Keep fit	For competition	0.832	0.008**
		No exercise	0.23	0.049*
	For competition	No exercise	-0.602	0.054

* $p<0.05$

According to the variance analysis in Table 5, samples for different exercise purposes show differences in attitude and perception.

In terms of attitude, there was a significant level of 0.05 for exercise purposes ($F=2.737$, $p=0.029$), and the average scores of the groups with obvious differences were: for health > competition; For Fun > Competition; Stay in shape > Compete; Other (or no sports) > Competition.

In terms of perception, the exercise purpose showed a 0.01 level of significance ($F=4.931$, $p=0.001$), and the average scores of the groups with obvious differences were: for health > competition; For health > other (or no exercise); For Fun > Competition; For fun > Other (or no exercise); Stay in shape > Compete; Staying in shape > Other (or not exercising at all).

Discussion

COVID-19 began to break out in the world at the end of 2019, posing a great threat to public health. The characteristics of the virus, such as strong infectiousness, rapid spread, and diverse transmission routes, limit people's gathering and travel, and to a certain extent affect the physical exercise behavior of the public, especially the young people aged 18-24 who are frequently physically active. Through our research, we found that nearly 80% of adolescents have been infected with COVID-19 during the epidemic, and half of those infected have mild infections. Due to the damage of virus infection to physical health, as well as social management and containment, more than 70% of adolescents exercise less than three days a week, and more than 70% of adolescents exercise less than half an hour each time. However, before the epidemic, Sun (2022) showed that the proportion of adolescent's exercise less than three times a week is about 6. The proportion of young people who do not exercise for more than half an hour each time is only close to five, which shows that the epidemic has caused certain troubles for young people to carry out physical exercise. Li (2022) found that during the COVID-19 epidemic, whether an individual can insist on exercising more is not only affected by external environment or weather factors but also affected by internal psychological conditions, such as anxiety and fear of contracting COVID-19.

In our study, we found that during the COVID-19 epidemic, women's attitude, knowledge, and perception of exercise behavior were all higher than men's, which may be because the epidemic caused more trouble to men's physical exercise than women's. Yan and Su (2019) study found that when there was no epidemic, less than 30% of female students participated in physical exercise three or more times a week, while nearly 50% of male students participated in physical exercise three or more times a week. Nearly 80% of male students participate in two or more physical exercises per week.

By comparing the exercise frequency of adolescents during and after the epidemic, we found that after the epidemic, the proportion of adolescents who exercised 3-5 days per week nearly doubled, and the proportion of adolescents who exercised more than 5 days per week also increased, while the number of adolescents who exercised less than 3 days per week decreased significantly. According to Yao et al (2023) and other studies, at present, most patients have recovered from the novel coronavirus infection, but after the end of the acute infection period, long-term hospitalization or home recuperation after the novel coronavirus infection will lead to a significant decline in muscle strength and endurance, and physical exercise can help restore strength and endurance. The second edition of the Rehabilitation Guidance Manual issued by the World Health Organization has included "regular physical exercise" in the rehabilitation

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

recommendations for people infected with the novel coronavirus. At present, most of the infected people in China have met the criteria for returning to exercise recommended by relevant literature. The study of Li and Li (2023) found that after the epidemic, college students' awareness of physical exercise has improved compared with that before the outbreak of the novel coronavirus epidemic, and the degree of emphasis and recognition of physical exercise has increased. The frequency and intensity of physical exercise have increased, and the outbreak of the novel coronavirus epidemic has enhanced the enthusiasm and initiative of college students in physical exercise. This may be because, after the outbreak of the epidemic, students experienced the benefits of physical exercise and changed their views on physical exercise, no longer thinking that physical exercise is only an optional form of entertainment. Against this background, schools, families, and society should carry out physical activity from multiple angles, create an atmosphere for physical exercise, and guide students to take the initiative to participate in it. Develop a lifelong exercise of physical health awareness and behavior.

The attitude of exercise behavior, for health, fun, for the body are different from competition, competition and no exercise are different; In terms of perception, there are obvious differences between health, fun, and keeping fit and competition, and there are obvious differences between health, fun and keeping fit and no exercise. Jiang et al. (2023) found that sports can bring many positive effects to people. In terms of relieving the pressure on teenagers, by participating in sports, teenagers can temporarily forget the pressure and troubles in life and transfer their attention to sports. Exercise allows the body to release natural happy substances such as endorphins, thereby regulating mood and improving mood. Physical exercise can help teenagers build self-confidence and self-esteem, through sports, you can find their good at the project, to cultivate a positive attitude and optimistic mood. The research of Li (2007) shows that adolescent students are in a critical period of growth and development, with large body shapes and plasticity. Regular physical exercise can promote blood circulation of bone tissue, thicken bone density, make bones stronger and stronger, improve flexural resistance, muscle contraction more powerful, and joints more flexible and firmer. These changes are conducive to the normal development of the student's body shape. In addition, when engaging in physical exercise outdoors, sunlight exposure can make the chemical 7-dehydrocholesterol in the human body become life-sustaining D. Vitamin D allows bones to better absorb and use calcium in the blood, which accelerates bone growth. Surveys show that students who regularly engage in physical exercise are 4-8 cm taller than average students of the same age.

Conclusion

1. During the period of COVID-19, the exercise habits of adolescents were as follows: most of them exercised less than 3 days a week, 284 of them, accounting for 74.54%; Secondly, 72 people exercised 3-5 days a week, accounting for 18.90%; 25 people exercised for more than 5 days, accounting for 6.56%.

2. During the period of COVID-19, the exercise duration of adolescents was as follows: most of them exercised for less than 30 minutes each time, 277 of them, accounting for 72.70%; 104 people exercised for more than 30 minutes each time, accounting for 27.30%.

3. During the COVID-19 epidemic, the majority of adolescents exercised for health purposes, with a total of 238 (62.47%); To keep fit, 57 people, accounting for 14.96%; Other (or did not exercise) 50 people, accounting for 13.12%; For fun, 32 people, accounting for 8.40%; To compete, 4 people, accounting for 1.05%.

4. After the COVID-19 epidemic, 201 adolescents exercised less than 3 days a week, accounting for 52.76%; 136 people exercised 3-5 days a week, accounting for 35.70; 44 people exercised more than 5 days a week, accounting for 11.54%. Compared with the period of the novel coronavirus epidemic, the proportion of people who exercised 3-5 days a week and more than 5 days a week increased significantly, while the proportion of people who exercised less than 3 days a week decreased significantly.

5. Comparing male and female exercise behaviors, it is found that samples of different genders have significant effects on knowledge behaviors, attitude behaviors, and behavioral awareness ($p<0.05$), which means that samples of different genders have differences in knowledge behaviors, attitude behaviors, and

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

behavioral awareness. Among them, gender showed 0.01 level significance for knowledge behavior (t=-2.687, p=0.008), and the specific comparison difference showed that the average value of males (1.43) was significantly lower than that of females (1.48). Gender showed a 0.05 level significance for attitude behavior (t=-2.017, p=0.044), and the specific comparative difference showed that the mean value of males (2.71) was significantly lower than that of females (2.81). Gender showed 0.01 level significance for behavior awareness (t=-2.826, p=0.005), and the specific comparison difference showed that the average value of males (2.79) was significantly lower than that of females (2.96).

6. The comparison of the three items of knowledge behavior, attitude-behavior, and behavioral awareness by exercise purpose shows that samples with different exercise purposes do not show a significant effect on knowledge behavior ($p>0.05$), which means that samples with different exercise purpose all show consistency in knowledge behavior without a difference. The samples for exercise purposes showed a significant effect on attitude behavior and behavior awareness ($p<0.05$), which means that samples for different exercise purposes have differences in attitude behavior and behavior awareness, and post-test analysis can be conducted specifically.

7. Exercise purpose showed a 0.05 level of significance for attitude behavior (F=2.737, p=0.029), and the average scores of the groups with significant differences were as follows: for health > competition; For Fun > Competition; Stay in shape > Compete; Other (or no sports) > Competition ".

8. The purpose of exercise showed a 0.01 level of significance for behavioral awareness (F=4.931, p=0.001), and the average scores of the groups with obvious differences were as follows: for health > competition; For health > other (or no exercise); For Fun > Competition; For fun > Other (or no exercise); Stay in shape > Compete; Staying in shape > Other (or not exercising at all).

Recommendation

1. According to the experimental results, exercise recommendations for adolescents during and after the epidemic were provided to local schools.

2. Expand the scope of the study, such as distributing questionnaires to different regions and different age groups.

3. Enrich the questionnaire's content, add more variables, and make the research questions more detailed and in-depth, such as the specific type of exercise and exercise items.

References

Bowen, R., Balbuena, L., Baetz, M., & Schwartz, L. (2013). Maintaining sleep and physical activity alleviates mood instability. *Preventive medicine*, *57*(5), 461-465.

De Sire, A., Lippi, L., Curci, C., Calafiore, D., Cisari, C., Ammendolia, A., & Invernizzi, M. (2021). Effectiveness of combined treatment using physical exercise and ultrasound-guided radiofrequency ablation of genicular nerves in patients with knee osteoarthritis. *Applied Sciences*, *11*(10), 4338.

Dong Y.F. (2004). The influence of sports on college students' emotional state during the SARS epidemic. Chinese Health Education, 10,101-103.

Fan, F. (2020). *A novel coronavirus epidemic modeling and analysis*. Master's degree thesis, Central China Normal University

Jiang, Y., Wang, Y., & Li, H. (2024). A review of the impact of physical exercise on adolescent mental health. (eds.) *Proceedings of the 11th Chinese Physical Training Scientific Conference (II) (pp.178-180).* College of Physical Education, Minzu University of China; Doi: 10.26914 / Arthur c. nkihy. 2024.002121.

Lai, J. S., Lan, C., Wong, M. K., & Teng, S. H. (1995). Two-year trends in cardiorespiratory function among older Tai Chi Chuan practitioners and sedentary subjects. *Journal of the American Geriatrics Society*, *43*(11), 1222-1227.

Li, J.R. (2007). On the scientific exercise of adolescence. *Journal of Bijie College*, 3,122-124.

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161

Li, L. (2022). *Research on residents' awareness of physical exercise, Exercise Behavior, and its Influencing Factors during the COVID-19 epidemic in Jiangxia District of Wuhan.* Master's Degree thesis, East China Normal University.

Li, M., & Li, F. (2023). A study on the status quo of Physical exercise consciousness and Physical exercise behavior of college students in Henan Province in the post-epidemic era. *13th National Sports Science Conference -- Wall Newspaper Exchange (Physical Fitness and Health Branch) (II) (pp.166)*. Henan Normal University; Doi: 10.26914/Arthurc.nkihy.2023.099798.

Li, X., Ma, X., & He, L. (2023). The effect of physical exercise behavior on the number of medical visits of urban residents: Convergence or divergence? *Journal of Shanghai Sports Institute*, 6, 42-56. Doi: 10.16099/j.sus.2022.05.09.0004.

Liu, X., & Zhao, S. (2022). *Study on the influence of family environment on the physical health of children and adolescents.* 12th National Sports Science Conference -- Wall Newspaper Exchange (School Sports Branch) (pp.1070-1071). Xi'an Physical Education Institute; Chaohu University; Chengdu Physical Education University; Doi: 10.26914/Arthurc.nkihy.2022.010750.

Lotan, M., Merrick, J., & Carmeli, E. (2005). A review of physical activity and well-being. *International Journal of Adolescent Medicine and Health*, *17*(1), 23-32.

Schöndube, A., Bertrams, A., Sudeck, G., & Fuchs, R. (2017). Self-control strength and physical exercise: An ecological momentary assessment study. *Psychology of sport and exercise,* 29, 19-26.

Sun, H.Y. (2022). Investigation and Countermeasures of Youth Sports. *Journal of Youth Science.* 2, 68-78.

Tang, M., Luo, C., He, D. (2020). Study on the status of adolescent physical activity and health promotion activities in Heilongjiang province. *Journal of Harbin Polytechnic.* 2, 134-136. The doi: 10.16145/j.carol carroll nki cn23-1531/z.2020.02.042.

Tian, W.W. (2021). Study on the relationship between physical exercise and sports friendship quality of adolescents under epidemic prevention and control. *23rd National Conference on Psychology (ii) (pp.599)*.

Vieira, M. D. C. S., Boing, L., Leitao, A. E., Vieira, G., & de Azevedo Guimaraes, A. C. (2018). Effect of physical exercise on the cardiorespiratory fitness of men—A systematic review and meta-analysis. *Maturitas*, *115*, 23-30.

Wang, F.Q. (2012). Socioeconomic status, lifestyle, and health inequality. *Society*. 2, 125-143. The doi: 10.15992/j.carolcarrollnki.31-1123/c. 2012.02.001.

Wu, F. (2020). Research on the status quo and countermeasures of youth physical exercise. *Education.* 39, 25-26.

Yan, Z.L., & Su, Y. (2019). A comparative study on physical exercise and sports injury accidents of male and female college students. *Sporting Goods and Technology*. 13,13-14.

Yao, W., Dou, X., Song, S., Zong, Z., Deng, Z., Yang, Q., & Wang, X.Q. (2023). Analysis of the status quo of physical and mental perception and physical activity of Shanghai College students after the "Class B and B Tube" of COVID-19. *13th National Sports Science Congress -- Special Report (Physical Fitness and Health Branch) (pp.796-798). Department of Physical Education, Shanghai Jiao Tong University; Faculty of Physical Education and Health Sciences, University of Vaskyla; Center for Sports Translational Medicine, Shanghai Jiao Tong University/National Center for Translational Medicine (Shanghai); Key Laboratory of Systems Biomedicine, Shanghai Jiao Tong University (Ministry of Education)/ Shanghai Center for Systems Biomedicine*. Doi:10.26914/Arthurc.nkihy.2023.065586.

Zhao Y. (2022). A study on the impact of physical activity on adolescents' mental health during the COVID-19 epidemic. *Youth Sports* (07),40-42.

Zhu, W., & Feng, X. (2022). Study on adolescent Physical health and its promotion under the influence of COVID-19. *12th National Sports Science Conference -- Wall Newspaper Exchange (Sports Psychology Branch) (pp.252-254)*

Citation
Xiao Han, L., & Panurushhthanon, P. (2025). Exercise Behavior During the COVID-19 Pandemic of Adolescents in Zhou Kou, China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 63-74;
DOI: https://doi.org/10.60027/ijsasr.2025.5161