

# Factors Influencing the Physical Fitness Status among Middle School Students in Jiangxi Province, China

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## ABSTRACT

This study aims to determine the physical health status of middle school students and its influencing factors as a basis for enhancing physical education courses, aiming to improve students' physical fitness. With the proliferation of technological devices, teenagers are spending more time in indoor activities, affecting their physical development. Through the implementation of national sunshine sports and related policies, students' physical fitness has improved, but there is still the problem of focusing on academics and neglecting sports. Research results show that students generally have good cardiopulmonary function, but have higher obesity rates. Personal, environmental, school and social factors have a significant impact on students' physical health status. To solve this problem, comprehensive measures need to be taken to improve physical education courses, encourage students to actively participate in sports activities, and improve overall health.

## KEYWORDS

Middle School Students; Physical Health; Physical Education Courses; Influencing Factors; Sunshine Sports.

## 1. INTRODUCTION

Physical Fitness among adolescents are very vital because it improve their body system in many ways. These days where students spend much time in indoor activities not necessarily sports related definitely has affected their adolescent's growth. With the proliferation of different technology gadgets that made the young individuals more attracted and having no if not less than time to spend for any physical fitness activities. This is one of the targets of the researcher in this study.

Improving students' physical fitness is a major event closely related to the future development of the country and nation. The "Decision of the Central Committee of the Communist Party of China and the State Council on Deepening Education Reform and Comprehensively Promoting Quality Education" pointed out: "Fitnessy physique is the basic prerequisite for young people to serve the motherland and the people, and it is the embodiment of the vigorous vitality of the Chinese nation." Therefore, all levels of party committees and governments must earnestly implement General Secretary Xi Jinping's important exposition spirit on strengthening the physical fitness of young people, establish the concept of fitness first, attach importance to school sports work, and understand the physical fitness of students; organize and guide schools, society and families to create good conditions for young students to strengthen their physical fitness, and to achieve China Dream provides talent protection.

Since the reform and opening up, the country's youth student sports undertakings have been vigorously developed, especially since the launch of the National Sunshine Sports Activity for

hundreds of millions of students, there has been a wave of campus physical exercise, school physical education has made great achievements, and the physical fitness of young students has been improved, which greatly improved the fitness of the whole people. However, while affirming the achievements, it must also clearly see the existing problems.

On the one hand, due to the impact of one-sided pursuit of enrollment rate, families and schools tend to emphasize cultural studies and underestimate physical exercises. Students have heavy academic burdens. There is a serious shortage of exercise time, which is also due to the limitations of sports facilities and venues, it is difficult to guarantee the effect of students participating in physical exercise.

Then, how to better allow students to participate in physical exercise under the existing system is a problem that urgently needs to solve. The country has a very large group of middle school students, who are the reserve force for the country's future construction and development, and a powerful new force for the country to realize socialism.

In recent years, the national physical fitness monitoring of young students had shown that the test results of vital capacity, explosive power, endurance, flexibility and other physical fitness and physical functions of young students in the country have greatly eased the downward trend and have basically been contained. This fully shows that the Sunshine Sports implemented in the country since 2007 is successful and the effect is significant.

It is necessary to continue to strengthen the effective intervention of students' physical exercises and develop colorful sunshine sports. Based on the full implementation of the "National Student Physical Fitness Test Standards", a standard test result recording system should be established, improved and be used as a comprehensive evaluation of students. This is also an important basis that should be combined with physical education teaching,

## **2. STATEMENT OF THE PROBLEM**

This study aims to determine the physical fitness status of middle school students, as well as the influencing factors that affect it, which will be used as basis in the creation of an enhanced physical education curriculum that shall strengthen the endeavors of improving their physical fitness.

Specifically, it will seek answers to the following questions:

(1) What is the profile of the student respondents, in terms of:

- 1) sex; and
- 2) grade level?

(2) What is the physical fitness status of the student respondents, in terms of:

- 1) body shape;
- 2) body functions; and
- 3) physical fitness?

(3) Is there a significant difference in the physical fitness status of the student respondents when they are grouped according to profile?

(4) To what extent are the following factors influencing the physical fitness status of the student respondents?

- 1) personal factors;
- 2) environmental factors;
- 3) school factors; and

4) social factors?

(5) Is there a significant difference in the extent of the factors influencing the physical fitness status of the student respondents when their profile is taken as test factor?

(6) Is there a significant relationship between the physical fitness status and factors that influences it?

(7) What enhancements may be done to the current physical education curriculum that will improve student's physical fitness status?

### **3. HYPOTHESIS**

The following hypotheses will be tested at 5% in this study:

Ho1: There is no significant difference in the physical fitness status of the student respondents when they are grouped according to profile.

Ho2: There is no significant difference in the extent of the factors influencing the physical fitness status of the student respondents when their profile is taken as test factor.

Ho3: There is no significant relationship between the physical fitness status and factors that influences it.

### **4. SCOPE AND DELIMITATION OF THE STUDY**

This research is mainly descriptive and comparative-correlational in nature which shall analyze collected data and information, in order to determine the current situation of the physical fitness of middle school students in Jinxi No. 1 Middle School in Jiangxi, Province. It will also explore several factors that influence physical fitness. The results are then to be used as basis in enhancing the present physical education curriculum, which shall focus on the improvement of the students' physical fitness.

This study will involve selected middle school students using stratified random sampling from Jinxi No. 1 Middle School in Jiangxi, Province. This research will be carried out in the second semester of the school year 2023-2024. The study shall utilize a 25-item researcher-made survey questionnaire based on the 2013 National Students Physical Fitness Standards for student participants.

The physical fitness test will be carried out in strict accordance with the "National Student Physical Fitness Standard" (middle school). The height and weight of middle school students will be measured with a height and weight scale to assess the physical condition of middle school students; a portable spirometer will be used to measure the vital capacity of middle school students,

To evaluate the physical function of middle school students; stopwatch will be used to test the performance of middle school boys in the 1000-meter run and girls' 800-meter run to assess the speed quality of middle school students; use the pull-up tester to test the pull-ups of middle school boys. Data to assess the upper limb strength quality of middle school boys; use the standing long jump tester to measure the long jump performance of middle school boys and girls to assess the lower limb strength quality of middle school students; use the sitting forward bending tester to test the middle school male and female students' forward bending data , To assess the flexibility of middle school students; use the sit-up tester to measure the data of middle school girls' crunches to assess the waist and abdomen strength of middle school girls.

The quantitative data will be statistically processed using SPSS24.0 and Excel software. The Frequency and percentage, Weighted mean and Standard deviation are used for analysis.

## 5. RESEARCH DESIGN

The study will use quantitative methods to conduct a descriptive study on the current status of the physical fitness of middle school students in Jinxi No. 1 Middle School in Jiangxi, Province. In order to elicit problems existing in the implementation of physical fitness promotion actions in middle schools in Jinxi No. 1 Middle School in Jiangxi, Province and give corresponding countermeasures and suggestions for improving the physical fitness of the students, and to discuss these factors how to influence the physical fitness of middle school students and to find ways to enhance PE curriculum in middle schools.

## 6. RESEARCH LOCALE

This study will be done in Jinxi No. 1 Middle School in Jiangxi, Province. Jinxi No.1 Middle School in Jiangxi Province is a bright educational pearl in Ganfu. It was founded in 1939 and was listed as a key middle school in Jiangxi Province in 1980, and was awarded as the modern educational technology Demonstration School in Jiangxi Province in 2000. The university is Tsinghua University, Wuhan University, Tongji University and other key universities.

The school covers an area of more than 140 mu, with more than 790 staff members, more than 8,200 students, and 165 classes. The elegant campus environment, pavilions, verdant trees, is the Fuzhou city green garden school, was rated as the province's health courtyard. The school has a campus observatory, a campus TV station and a German education base, a laboratory, library, voice room, electronic preparation room, studio, gym, music and dance studio, studio, and the campus wireless network has been opened.

Adhere to the concept of "everything for the development of the school, everything for the progress of teachers, everything for the growth of students, everything for the harmony of education", innovation and excellence, run the people satisfied with the school.

Today, the scale of Jinxi No.1 Middle School is second to none in the city, the management mechanism is full of vitality, the faculty is strong, the teaching quality is excellent, the comprehensive school strength is constantly enhanced, and the reputation of the school is expanding. In the new century, the six thousand teachers and students of Jinxi No.1 Middle School will, as always, adhere to the school instruction of "everything is conducive to the development of the school, everything is conducive to the improvement of teachers, everything is conducive to the growth of students", welcome students from all directions, enjoy the talented education, and strive to pave the way for thousands of students to become talented.

## 7. RESULTS

### (1) Profile of the Respondents

Table 1 shows the demographic profile of the student respondents in terms of their age, and sex.

In terms of age, thirty-six (36) or about 22.5% of the respondents are 18 years old, fifteen (15) or about 9.4% of the respondents are 19 years old, eighty (80) or 50% of the respondents are 20 years old, and the remaining twenty-nine (29) or about 18.1% of the student respondents are 21 years old. This means that majority of the respondents are 20 years old. This may be taken to mean that the respondents are in the appropriate grade level given their age.

In terms of sex, seventy-eight (78) or about 48.8% of the respondents are male and the remaining eighty-one (81) or about 51.3% of the respondents are females. This means that the majority of the respondents are females in terms of sex. This may be taken to mean that there are more female students than male students in the institution.

**Table 1.** Frequency Distribution of the Teacher Respondents' Profile

<b>Profile</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
18 years old	36	22.5%
19 years old	15	9.4%
20 years old	80	50%
21 years old	29	18.1%
<b>Total</b>	<b>160</b>	<b>100%</b>
<b>Sex</b>		
Male	78	48.8%
Female	81	51.3%
<b>Total</b>	<b>160</b>	<b>100%</b>

## (2) Physical Fitness Status of the Student Respondents

Table 2 shows the physical fitness status of the student respondents, in terms of body shape, body functions, and physical fitness.

**Table 2.** Physical Fitness Status of the Student Respondents

<b>Body Shape</b>		
<18.5: underweight	37	23.1%
18.5-24.9: normal weight	37	23.1%
≥25.0: overweight	41	25.6%
≥30.0: obesity	45	28.1%
<b>Total</b>	<b>160</b>	<b>100%</b>
<b>Body Functions</b>		
2300 - 25000	58	36.3%
2600 - 2800	9	5.6%
2900 - 3100	14	8.8%
3200 - 3500	1	0.6%
3600 - 3800	12	7.5%
3800 and above	66	41.3%
<b>Total</b>	<b>160</b>	<b>100%</b>
<b>Physical Fitness</b>		
Physically Fit	160	100%
<b>Total</b>	<b>160</b>	<b>100%</b>

In terms of body shape assessment, thirty-seven (37) or about 23.1% of the student respondents are underweight based on their body shape assessment, thirty-seven (37) or about 23.1% of the student respondents are underweight based on their body functions assessment, forty-one (41) or about 25.6% of the student respondents have a normal weight according to their body shape assessment, and forty-five (45) or about 28.1% of the respondents are obese based on their body functions assessment. This means that majority of the respondents assessed their body shape to be obese as indicated by their body mass index. Based on the findings, it's evident that a significant portion of the student respondents, approximately 23.1% according to both body shape and body functions assessments, are classified as underweight. This could suggest potential issues related to inadequate nutrition or health conditions affecting their weight. Additionally, approximately 25.6% of the respondents are within the normal weight range based on their body shape assessment, indicating a relatively healthy weight distribution among this subset of students.

However, concerning is the fact that a notable portion of the respondents, about 28.1%, are classified as obese based on their body functions assessment. This indicates a higher prevalence of obesity among the student population, which can have serious implications for their overall health and well-being. Obesity is associated with various health risks, including cardiovascular diseases, diabetes, and musculoskeletal issues, among others.

The high prevalence of obesity among the respondents suggests potential lifestyle factors contributing to this phenomenon, such as poor dietary habits, sedentary behavior, and lack of physical activity. These factors can significantly impact their physical fitness levels, as obesity is often accompanied by reduced cardiovascular endurance, strength, and flexibility.

Moreover, the findings raise concerns about the overall physical fitness levels of the student population. While all respondents are deemed physically fit based on the provided data, the high prevalence of obesity and the relatively low percentage of students classified as having a normal weight highlight the importance of promoting healthy lifestyle habits and physical activity among students.

To address these concerns and improve the physical fitness of the student population, interventions focusing on nutrition education, promoting regular physical activity, and creating supportive environments for healthy behaviors are essential. Implementing comprehensive school wellness programs and integrating physical education into the curriculum can play a crucial role in fostering healthier habits and improving the overall well-being of students.

In terms of body functions as indicated in their vital capacity, fifty-eight (58) or about 36.3% of the student respondents fall into the range of 2300 - 2500 in their body functions assessment, nine (9) or about 5.6% of the student respondents fall into the range of 2600 - 2800 in their body functions assessment, fourteen (14) or about 8.8% of the student respondents fall into the range of 2900 - 3100 in their body functions assessment, one (1) or about 0.6% of the student respondents fall into the range of 3200 - 3500 in their body functions assessment, twelve (12) or about 7.5% of the student respondents fall into the range of 3600 - 3800 in their body functions assessment, and sixty-six (66) or about 41.3% of the student respondents fall into the range of 3800 and above in their body functions assessment. This means that majority of the respondents assessed their body function, as indicated in their vital capacity, to be at around 3800 and above. Based on the findings of the body functions assessment, it's evident that a significant portion of the student respondents, approximately 41.3%, fall into the range of 3800 and above in their vital capacity. This suggests that a considerable number of students have a relatively high vital capacity, which is indicative of good lung function and respiratory efficiency. On the other hand, smaller proportions of students fall into lower ranges of vital capacity, with only about 5.6% falling into the range of 2600 - 2800, and even fewer in the ranges below that.

The vital capacity, which measures the maximum amount of air a person can expel from the lungs after a maximum inhalation, is an essential indicator of respiratory health and endurance. Having a

higher vital capacity generally implies better cardiovascular fitness and endurance, as it allows individuals to sustain physical activity for longer durations without experiencing fatigue.

Given that a majority of the respondents have a vital capacity of 3800 and above, it suggests that they likely have good cardiovascular health and respiratory efficiency. This is a positive indicator for their overall physical fitness, as individuals with higher vital capacity tend to perform better in aerobic activities and are less prone to fatigue during physical exertion.

However, it's important to note that vital capacity is just one aspect of physical fitness, and other factors such as muscular strength, flexibility, and body composition also play significant roles. Therefore, while a high vital capacity is favorable for overall fitness, it should be complemented with other aspects of fitness to ensure a well-rounded and healthy lifestyle.

In conclusion, the majority of the student respondents demonstrating high vital capacity levels indicate a positive correlation with their physical fitness, particularly in terms of cardiovascular health and endurance. This suggests that they are likely to excel in aerobic activities and have a lower risk of experiencing fatigue during physical exertion compared to those with lower vital capacity levels. However, a comprehensive approach to physical fitness, including strength training, flexibility exercises, and proper nutrition, is essential for optimal health and performance.

In terms of physical fitness, all one hundred and sixty (160) student respondents are deemed physically fit according to the specified criteria. This comprehensive assessment takes into account various aspects of physical fitness, encompassing both cardiovascular endurance and muscular strength, tailored to accommodate differences between genders.

The criteria utilized to evaluate physical fitness cover a range of exercises and assessments, ensuring a holistic understanding of the students' overall health and fitness levels. For instance, the 50m and 1000m runs serve as indicators of cardiovascular endurance, with the time thresholds set to discern an adequate level of aerobic capacity. Similarly, the pull-up requirement for males evaluates upper body strength, reflecting muscular endurance and overall fitness.

Moreover, the assessments also consider specific exercises tailored to gender differences. The 800m run for females and the 1-minute crunches directly address areas of strength and endurance unique to female physiology, providing a well-rounded evaluation of their fitness. Additionally, the criteria extend beyond pure physical performance, incorporating flexibility as demonstrated by the sitting forward bending test, which evaluates overall body flexibility.

Furthermore, the standing long jump serves as a measure of explosive power and lower body strength, offering insights into students' agility and coordination. By including a diverse set of criteria, the assessment ensures a comprehensive evaluation of various aspects of physical fitness, allowing for a nuanced understanding of each student's capabilities.

Overall, the findings suggest that the student population exhibits a high level of physical fitness across multiple domains. The rigorous criteria employed in the assessment provide assurance that students possess the necessary attributes to maintain a healthy and active lifestyle. This holistic approach not only promotes physical well-being but also underscores the importance of regular exercise and fitness maintenance in achieving optimal health outcomes.

## **8. CONCLUSION**

(1) The demographic profile of the student respondents revealed that the majority of the respondents are 20 years old and are females in terms of sex.

(2) There is a complex interplay of factors influencing the physical fitness status of student respondents. While a significant portion of students demonstrated good cardiovascular health and respiratory efficiency, indicated by their high vital capacity levels, concerns were raised regarding

the prevalence of obesity among the student population. Despite this, the comprehensive assessment of physical fitness revealed that all respondents met the specified criteria, indicating a generally high level of fitness across various domains. These findings highlight the importance of holistic interventions targeting nutrition, physical activity promotion, and environmental support to address existing challenges and further enhance the overall physical fitness and well-being of students. By adopting a multifaceted approach and addressing individual needs, schools and communities can better support students in achieving and maintaining optimal health outcomes.

(3) The agreement among students regarding the importance of personal factors in influencing physical fitness status highlights the multifaceted nature of health and well-being. By recognizing the interconnectedness of lifestyle habits, mindset, motivation, genetics, and socio-economic factors, students can empower themselves to make informed choices that support their physical fitness goals. Cultivating a holistic approach to health that addresses these personal factors is essential for promoting lifelong fitness and well-being among students.

(4) The agreement among students regarding the influence of environmental factors on physical fitness status highlights the interconnectedness between surroundings and health outcomes. By recognizing the importance of factors such as access to recreational spaces, air quality, clean water, and transportation options, students can advocate for environments that support and promote physical activity and overall well-being. Addressing environmental determinants of health is essential for creating environments that foster healthy behaviors and contribute to the physical fitness and overall health of students.

(5) The agreement among students regarding the influence of school factors on physical fitness status underscores the importance of educational environments in promoting health and wellness. Schools play a central role in shaping students' physical fitness levels through comprehensive PE programs, access to recreational facilities, supportive policies, and a culture that values health and wellness. By prioritizing school factors that support physical activity and wellness, educational institutions can contribute significantly to improving the physical fitness and overall health of their student populations.

(6) The unanimous agreement among students regarding the influence of social factors on physical fitness status highlights the pervasive impact of social dynamics on health behaviors and outcomes. By recognizing the importance of social factors in shaping physical fitness status, educators, policymakers, and community leaders can implement strategies to foster supportive social environments, promote positive peer influences, and enhance access to resources and opportunities for physical activity participation. By addressing social determinants of physical fitness, stakeholders can empower students to lead healthier, more active lifestyles and achieve optimal health and well-being.

(7) The summary of the assessment underscores the multifaceted nature of factors influencing the physical fitness status of student respondents. While personal choices, environmental conditions, school-related influences, and social dynamics all play significant roles, there is a clear acknowledgment among students of their collective importance.

(8) While demographic factors such as age and gender appear to influence students' perceptions of certain factors affecting physical fitness status, the high agreement levels across most categories suggest a general consensus among respondents.

(9) The rejection of the null hypothesis in the cases of body functions and overall physical fitness status indicates that these differences are not due to random chance.

(10) Overall, while personal, environmental, and school-related factors do not show significant correlations with physical fitness status, social factors emerge as influential.

## 9. RECOMMENDATIONS

- (1) Although the analysis did not reveal significant associations between body functions and environmental factors, there was a significant correlation between body functions and social factors. Therefore, further research is recommended to delve deeper into the specific social factors that may significantly impact physical fitness. This could involve qualitative studies to explore students' social environments, peer influences, and support systems that contribute to their physical fitness levels.
- (2) Given the significant differences observed in overall physical fitness ratings between male and female respondents, it is essential to tailor interventions to address gender-specific needs. For example, programs promoting physical activity and fitness may need to incorporate activities that appeal to both genders equally and consider gender-specific barriers to participation.
- (3) While certain factors may not individually influence physical fitness significantly, their collective impact should not be overlooked. The study highlighted the interconnectedness of various factors such as personal, environmental, school, and social factors. Therefore, interventions aimed at improving physical fitness should adopt a holistic approach that addresses multiple dimensions simultaneously. This could involve collaboration between schools, communities, and healthcare providers to create supportive environments that promote healthy behaviors.
- (4) To better understand the dynamic nature of physical fitness and its influencing factors, longitudinal studies tracking students' physical fitness status over time are recommended. This would allow researchers to assess how changes in personal, environmental, school, and social factors impact physical fitness outcomes over the course of students' academic careers.
- (5) Schools should prioritize physical fitness education as an integral part of the curriculum. This includes not only physical education classes but also opportunities for active transportation, extracurricular sports, and wellness programs. By promoting a culture of physical activity and healthy living within the school environment, students are more likely to adopt lifelong habits that support optimal physical fitness.
- (6) Although environmental factors did not show significant associations with physical fitness status in this study, promoting environmental sustainability remains important for overall well-being. Encouraging initiatives such as walking or biking to school, reducing carbon emissions, and preserving green spaces can contribute to both environmental health and physical fitness.
- (7) Schools and healthcare providers should conduct regular physical fitness assessments to monitor students' progress and identify areas for improvement. These assessments should encompass various components of physical fitness, including cardiovascular endurance, muscular strength, flexibility, and body composition, to provide a comprehensive picture of students' overall health status.

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