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Practical Research on Students' Physical Fitness Improvement based on Reading

Xiangrong Ma [1, a], Bin Gong [2, b]

[1] The vast affiliated middle school experimental primary school, Baiyun District, Guangzhou, 510000, China
[2] Guangzhou Bayi experimental School, 510000, China
[a] 471641046@qq.com, [b] 47764673@qq.com

Abstract: Sports reading is mainly in the spare time to read sports related, such as sports pictures, sports star autobiography class, scientific exercise class, sports education class, sports culture class, sports health care and medical class, Olympic theme class and other books, to get more sports knowledge. This study aims to explore the impact of physical reading on students' physical fitness by carrying out physical reading tests on students and conducting classified analysis and evaluation according to their reading content. It is found that physical reading can improve students' physical fitness to a certain extent, especially in sprint, lower limb explosive power (standing long jump) and middle and long-distance running events. However, the effects on flexibility and muscle endurance were not significant enough. The results show that sports reading has potential in improving students' physical fitness, and provides suggestions and discussions for further development.

Keywords: Sports Reading; Students Physical Fitness; Practical Research.

1. Introduction

Students' physical fitness has an important impact on their physical and mental health and learning ability. However, with the change of modern lifestyle, students' physical fitness generally declines [1.2.3]. Therefore, it is very important to find a way to improve students' physical fitness. As an activity that combines sports knowledge and reading habits, sports reading may become an effective way [4.5]. Scholars point out that sports reading refers to the activity of acquiring sports knowledge and information through reading sports-related books, articles or magazines [6]. This form of reading can help students understand the rules, techniques and strategies of different sports, and develop their interest and understanding of sports. In addition, sports reading can also stimulate students' sports motivation and encourage them to actively participate in physical exercise and training [7].

In addition, in order to improve students' reading ability and respond to the special work of "smart reading" in Guangzhou, the reading project of all primary and secondary schools in Guangzhou has been promoted and applied on a large scale, which can be said to be the advance layout and positive response to the reading activities proposed by the Ministry of Education. In order to increase students' knowledge of sports and promote students' all-round development of morality, intelligence and body, sports reading is mainly in spare time to read books related to sports, such as sports pictures, sports star autobiography, scientific exercise, sports rules, sports military, sports politics, sports economy, sports education, sports culture, sports health care and medical treatment, and Olympic theme. In addition, sports reading is infiltrated into various disciplines such as Chinese, mathematics, English and art, so as to acquire more sports knowledge and learn the spirit of sports people, so as to strengthen students' understanding and cognition of sports and improve students' interest in sports, so as to improve students' participation in sports, autonomy and initiative to choose physical exercise, thus promoting students' physical fitness.

Studies have shown that there is a certain correlation between physical reading and students' physical fitness. By reading sports related content, students can increase their understanding and cognition of physical exercise and acquire certain knowledge of sports skills [5.6.7]. This knowledge and understanding can help students to do physical exercise more effectively and improve their physical fitness level. In this study, the researchers analyzed and evaluated the reading content of the students. The content of sports reading can be divided into different categories, such as sports rules and tactics, sports skills and training methods, sports psychology and sports nutrition. By categorizing students' reading material, researchers can assess the breadth and depth of physical education knowledge students are exposed to, as well as its significance as a guide to physical exercise. Therefore, this study conducted a one-year physical reading experiment in Class 1, Grade 2019, Guangzhou Bayi Experimental School, aiming to explore the correlation between physical reading and students' physical fitness, and provide practical research to further verify its effectiveness.

2. Research Object and Method

This study selected 20 students of Guangzhou Bayi Experimental School as the research objects. First, all students were tested for physical fitness, including sprint, standing long jump, middle and long distance running, flexibility and muscle endurance. Then, according to the reading content of the students, they were divided into two groups: sports reading group and non-sports reading group. Students in the sports reading group read books or magazines related to sports, while students in the non-sports reading group read content unrelated to sports. The specific methods are as follows

2.1. Literature Data Method

By consulting books on PE teaching theory courses, youth PE, PE reading and other related knowledge materials, this study provides a theoretical basis for this research.

2.2. Experimental Method

A one-year experiment on sports wisdom reading was carried out in Class 1 and Class 2 of 2019 in Guangzhou Bayi Experimental School. Class 1 was an experimental class with sports reading in their spare time, while Class 2 was a control class without sports reading. The students' physical fitness was tested before and after the experiment, which provided the data support for this study.

2.3. Mathematical Statistics

The data of the experimental indicators were processed by SPSS21.0 statistical software, and the results were represented by mean value (M)± standard deviation (SD). No significant difference, $P > 0.05$, significant difference, $P < 0.05$, very significant difference, $P < 0.01$.

3. Results and Analysis

3.1. Comparative Analysis of Total Physical Test Scores Before the Experiment

Before the experiment, 10 boys and 10 girls were selected from class 1 and class 2, respectively, and the 50-meter run, standing long jump, sitting forward bend, 1000-meter run (male), pull-up (male), 800-meter run (female), and one-minute sit-up (female) of the National Physical Health Test of students were taken as the detection indicators of students' physical fitness, and strict tests were carried out. The obtained data results are shown in Table 1:

Table 1. Total physical test scores of Classes 1 and Class 2 before the experiment (2020)

	Class and grade	Mean value	Standard deviation	P
male	1	87.14	8.787	0.969
	2	87.3	9.296	
female	1	91.39	6.064	0.743
	2	90.5	5.899	

Note: P > 0.05 had no significant difference, P < 0.05* significant difference, P < 0.01** extremely significant difference

It can be seen from the data in Table 1 that the total physical test scores of both male and female students in the two classes before the experiment are $p > 0.05$. Therefore, there is no significant difference in physical test scores of the students in the two classes before the experiment, which can be used as the experimental research objects of this study and the control class.

3.2. Comparative Analysis of Physical Test Scores Before and After the Experiment

After conducting the pre-experiment test of two classes, class 1 was selected as the experimental class to carry out a one-year physical reading, which mainly used spare time to read sports related materials. Such as sports pictures, sports star autobiography class, scientific exercise class, sports rules class, sports military class, sports politics class, sports economy class, sports education class, sports culture class, sports health care class, Olympic theme class and other books, while class 2 did not do this requirement. After the physical test in 2021, the results of 50m running, standing long jump, sitting forward bend, 1000m running (male), pull-up (male), 800m running (female) and one-minute sit-up (female) of the two classes were compared before and after the experiment, and the results were as follows:

3.2.1. Comparative Analysis of Boys' Performance Before and After the Experiment

The physical and physical indexes of male students in this experiment were selected from the "National Physical Health Test for Students", including 50 meters running, standing long jump, sitting forward bend, 1000 meters running, and pull-up. After a year, the data of the two test results are shown in Table 2 and Table 3:

Table 2. Physical test results of boys in Class 1 of vs2021 in 2020

	A given year	Mean value	Standard deviation	P
50m race	2020	8.09	0.7218	0.014*
	2021	7.19	0.7608	
Standing long jump	2020	188.8	24.657	0.025*
	2021	210	7.211	
Sit in a forward bend	2020	12.91	3.933	0.709
	2021	13.78	6.085	
800m Race (S)	2020	227.6	32.708	0.036*
	2021	201.7	15.363	
Sit-ups for one minute	2020	2.6	2.221	0.298
	2021	3.5	1.252	

As can be seen from Table 2, compared with the results in 2020, the P values of 50m running, standing long jump and 1000m running of boys in Class 1 are all less than 0.05, showing significant differences. Combined with the mean value and standard deviation, the results in 2021 are higher than those in 2020.

From the data results in Table 3, it can be seen that the performance of boys in Class 2 in 2021 has not improved significantly compared with 2020, and the performance of pull-up has decreased compared with 2020, only the performance of 1000m running has improved significantly, P=0.001, showing a significant difference.

Table 3. Physical test results of boys in Class 2 of vs2021 in 2020

	A given year	Mean value	Standard deviation	P
50m race	2020	7.38	0.6596	0.944
	2021	7.36	0.5929	
Standing long jump	2020	202.7	25.634	0.291
	2021	214.9	24.506	
Sit in a forward bend	2020	10.9	7.088	0.936
	2021	11.13	5.324	
800m Race (S)	2020	257.2	24.462	0.001**
	2021	222.1	16.251	
Sit-ups for one minute	2020	7.6	5.562	0.094
	2021	4.1	2.885	

3.2.2. Comparative Analysis of Girls' Performance Before and After the Experiment

The physical and physical indexes of female students in this experiment were selected from the "National Physical Health Test for Students", including 50 meters running, standing long jump, sitting forward bend, 800 meters running, and one-minute sit-ups. The data of the two test results before and after the experiment are shown in Table 4 and Table 5:

Table 4. Physical test results of girls in Class 1 of vs2021 in 2020

	A given year	Mean value	Standard deviation	P
50m race	2020	8.56	0.4926	0.023*
	2021	8	0.5164	
Standing long jump	2020	179.8	12.882	0.025*
	2021	194.5	13.946	
Sit in a forward bend	2020	15.32	4.302	0.799
	2021	16.05	7.849	
800m Race (S)	2020	212.7	19.777	0.009**
	2021	193.3	6.881	
Sit-ups for one minute	2020	45.8	6.828	0.711
	2021	44.8	4.894	

Combined with the average value and P-value in Table 4, we can see: Girls in Class 1, except for lying on their back for one minute, the results of the other four events in 2021 are all better than those in 2020. Among them, the results of 50m running and standing long jump show significant differences ($P < 0.05$), indicating that the results of these two events have been significantly improved after the experiment; in addition, the results of 800m running show very significant differences ($P < 0.01$). It shows that 800 meters running performance has made great progress.

Table 5. Physical test results of girls in Class 2 of vs2021 in 2020

	A given year	Mean value	Standard deviation	P
50m race	2020	8.39	0.4383	0.643
	2021	8.49	0.5065	
Standing long jump	2020	185.5	17.703	0.508
	2021	191.1	19.319	
Sit in a forward bend	2020	16.68	5.8827	0.72
	2021	17.54	4.5981	
800m Race (S)	2020	207.2	20.159	0.905
	2021	206.2	16.403	
Sit-ups for one minute	2020	39.2	7.955	0.315
	2021	42.2	4.59	

According to the average value in Table 5, we can see that the performance of girls in class 2 has improved before and after the experiment, but there is no significant difference ($P > 0.05$) combined with the P-value, indicating that the performance has not improved significantly after one year.

To sum up, from the test results of 2021, both boys and girls in class 1 are better than those in class 2. Although the scores of both classes are improved compared with those in 2020, the scores of classes 2 are not significantly improved, and the scores of Classes 1 are significantly improved before and after the experiment, indicating that sports reading can improve students' physical education knowledge. It also helps to

promote the improvement of students' physical fitness test results, so as to improve students' physical fitness, especially for the improvement of 50 meters running, standing long jump, 800 meters running and 1000 meters running.

4. Discussion

According to the above research results, through the physical fitness test of the two groups of students, it is found that the performance of the students in the sports reading group is significantly better than that of the students in the non-sports reading group in the sprint, standing long jump and middle- and long-distance running events. This shows that sports reading has obvious positive effects on improving students' explosive power and endurance. However, when it came to flexibility and muscle endurance, the differences between the two groups were not significant. This may be because sports reading focuses more on skill and strategy and less on the development of flexibility and muscle endurance.

4.1. The Impact of Physical Reading on the Improvement of Students' Physical Fitness

This study found that sports reading can improve students' physical fitness to a certain extent. By reading sports related books, articles or magazines, students can increase their understanding and awareness of physical exercise and gain knowledge of sports techniques. This knowledge and understanding can help students perform physical exercise more effectively, thereby improving their physical fitness level [8]. In addition, sports reading can also stimulate students' interest and motivation in sports, prompting them to participate more actively in physical exercise and training. Therefore, sports reading has potential in improving students' physical fitness.

4.2. Possible Mechanisms for Improving Sprint, Lower Limb Explosive Power and Middle- and Long-Distance Running Events

Sports reading may improve students' performance in sprint, lower extremity explosive power and middle-distance running events through the following mechanisms. First of all, sports reading enables students to understand the skills, strategies and training methods of related items, and helps them better master correct movements and skills, thus improving sports performance [9.10]. Secondly, sports reading can enhance students' understanding and cognition of sports, and promote them to train more purposefully and improve their own ability. Finally, sports reading can also stimulate students' interest and motivation in sports, so that they can participate more actively in the training and competition of related projects, so as to improve their physical fitness level.

4.3. Reasons for no Significant Improvement in Flexibility and Muscle Endurance

This study found that sports reading did not significantly improve flexibility and muscle endurance. This may be because sports reading focuses more on the teaching of skills and strategies, and less on the training of flexibility and muscle endurance [11.12]. In addition, the improvement of flexibility and muscle endurance requires more systematic and targeted training methods, and reading alone may not achieve more obvious results. Therefore, adding the knowledge of flexibility and muscle endurance training to the content of sports reading, and strengthening the practical athletic ability of students through practical activities, may help to improve flexibility and muscle.

4.4. Improvement Effect of Sprint Events

This study found that through sports reading, students performed significantly better in sprint events than students who did not do sports reading. This may be because students have learned the skills and training methods of sprinting through reading and improved their understanding and application of sprinting [13]. In addition, sports reading can also stimulate students' sports interest and motivation, prompting them to participate in sprint training more actively, thus improving the performance of sprint events.

4.5. Improvement of Lower Limb Explosive Power (Standing Long Jump)

The results show that physical reading can improve the explosive power of students' lower limbs. By reading about the skills and training methods of standing long jump, students can better master the correct movements and jumping skills, so as to improve the explosive power of lower limbs. However, further research is needed to explore how to further enhance lower limb explosive power through physical reading, such as combined with practical activities or specialized training courses.

4.6. Improvement Effect of Middle- and Long-Distance Running Events

In the middle- and long-distance running events, sports reading also has a certain role in promoting students' physical fitness. By reading about training methods and strategies for middle and long distance running, students can better develop training plans and master correct breathing and rhythm skills [14]. All these factors contribute to improving students' performance in middle- and long-distance running events.

4.7. Facilitation of Flexibility and Muscle Endurance

However, in terms of flexibility and muscle endurance, the promotion effect of sports reading was not significant enough. This may be because sports reading focuses more on the teaching of skills and strategies, and less on the training of flexibility and muscle endurance. Therefore, it is suggested to add the knowledge of flexibility and muscle endurance training to the content of sports reading, and strengthen students' actual sports ability through practical activities.

5. Conclusion

The results of this study show that sports reading can improve students' physical fitness to a certain extent, especially in sprint, lower extremity explosive power and middle-distance running events. However, further research is needed on the promotion of flexibility and muscle endurance. It is suggested that the knowledge of flexibility and muscle endurance training should be added to the content of sports reading, and practical activities should be carried out to strengthen students' actual sports ability. in addition, further research on how to improve students' flexibility and muscle endurance through sports reading is also an important direction.

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