

Empirical Study on the Effects of Different Exercise Interventions on the Mental Health of Rural Left Behind Children

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Keywords: Rural Left Behind Children, Mental Health, Different Sports, Intervention Effect

Abstract: With the rapid development of the economy, people's pace of life has become faster and faster, and they are more eager for a higher level of economic life. This has led to a large number of surplus rural labor entering cities, and they have started to work outside. At the same time, it has also led to a large number of left behind children in rural areas. They are at a critical juncture in their life development, as a result of long-term lack of family affection, lack of parental care and education, many left behind children have varying degrees of mental health problems. The experiments involved in this paper show that although badminton, aerobics, basketball and volleyball and other sports have different positive effects, they can indeed alleviate depression, fear, mental disorders and sleep and other adverse conditions.

1. Introduction

At present, there are a large number of children of migrant workers in rural China. Rural left behind children are a special group who are prone to psychological problems, and it is necessary to provide them with mental health education. In the development process of modern society, the mental health education of left behind children in rural areas has become a very important issue. It is not only an urgent educational problem that needs to be solved, but also a social problem. Despite certain research results, the psychological health issues of migrant workers' children have not been fundamentally addressed. Therefore, schools and teachers should pay sufficient attention to the mental health issues of left behind children in rural areas, strengthen their mental health education, so that they can receive more care in their learning and life, and enable them to learn and grow healthier.

A large number of scholars have conducted relevant research on the mental health of left behind children. In order to evaluate the neglect of left behind children in China, Wen Y J conducted a study on a large sample of 0-18 year old children in China (N=4203), with a total of 18688 left behind children. Based on the assessment model of child neglect in rural areas of China and the parent-child conflict strategy scale, a comparison was made between children with one or two

parents who were away for more than 6 months and non left behind children. The following conclusions were drawn: left behind children are more severe in emotional neglect, medical neglect, physical neglect, safety neglect, educational neglect, and social neglect [1]. In order to study the phenomenon of depression in left behind children, Ding L collected a total of 5 databases, including the China Knowledge Infrastructure Database, Wanfang Database, VIP Database, PubMed Database, and Science Website. A total of 63 literature published in this field from 2000 to 2017 were collected. 21 papers (including 18 Chinese papers and 3 English papers) meet the inclusion criteria for meta-analysis (quantitative systematic review). The incidence of depression among left behind children is approximately 26.4%. The reported results show significant heterogeneity, which is related to three research characteristics: unclear definition of left behind children, ineffective use of depression tools, and geographical location [2]. Lam T discussed methodological improvements regarding the psychological problems of left behind children in the future. Due to the thoughts and behaviors of left behind children, it is necessary to consider the perspective of children in development and migration issues, improve the welfare of children and their families, and make migration a sustainable development strategy for all humanity. In this large group, there is a risk of mental health problems, which requires quantifying the level and distribution of their mental health status [3]. Although the above studies have conducted relevant research on the mental health problems of left behind children, there is little mention of measures to address the current mental health problems of left behind children.

This article first studies the causes, improvement methods, and positive effects of different exercise interventions on the mental health problems of left behind children. Finally, experiments have shown that different exercise interventions do have a significant positive effect on the mental health of left behind children.

2. Different Sports Interventions and Mental Health of Left behind Children

2.1. Psychological Health of Left behind Children

2.1.1. The Main Mental Health Problems of Left behind Children

(1) Solitary personality, introverted and autistic

Due to the lack of love from parents, no one is willing to listen to their needs, nor are they willing to listen to their troubles. Therefore, left behind children often become isolated due to factors such as fear and helplessness. Once they see others, they subconsciously close themselves up and refuse to communicate with others. Moreover, when they see people around them with parents, they become inferiority complex, which can easily lead to mental illnesses such as depression and social phobia [4].

(2) Lack of security

Left behind children with serious reverse psychology generally lack a sense of security and are full of doubts about everything around them, which is related to their frequent bullying and neglect. Faced with such emotions, left behind children are prone to choosing attitudes such as violence and sensitivity, blindly resisting [5]. They like to confront teachers and parents. But in fact, they are envious of other children having parents pick them up and drop them off, and being able to have meals with their parents. But this unattainable emotion is likely to evolve into hatred towards parents [6].

(3) The awareness of morality and responsibility is vague.

Left behind children have a reverse psychology towards school teaching because they have not received timely guidance from their parents at an appropriate age. Parents also do not attach importance to their psychological and moral would cultivation. Therefore, their moral awareness

and sense of responsibility are very weak. In this way, they would judge things based on their own thoughts. The ethical standards constructed by these self righteous individuals are often difficult to get on track [7].

2.1.2. Psychological Health Status and Causes of Left behind Children

(1) Lack of parents increases children's sense of security and trust crisis

Because one or both of the parents of left behind children go out to work, their parents are not around for a long time, and the children do not receive sufficient attention and care, which increases their sense of insecurity and distrust. Family is the harbor in everyone's heart, as well as the starting and ending point of their lives. A good family atmosphere can help establish a more harmonious relationship between their families, thereby enhancing their parent-child relationship, and so on. On the contrary, improper parenting methods by parents or guardians can lead to distrust and lack of security among family members [8].

(2) Lack of school education and social care

According to the survey, most parents or guardians of left behind children in rural areas have not received high education, and their educational level and knowledge level are very low, which leads to their inability to provide comprehensive education for their children. Their educational concepts are outdated and often focus more on their children's studies, neglecting various aspects of their physical and mental health [9].

School life has a significant impact on left behind children, as they have not enjoyed the companionship of their families for a long period of time. Therefore, school life has become their spiritual sustenance. Due to a long-term lack of parental care, left behind children hope that teachers and the collective can provide them with more care, and hope to use the warmth of teachers and the collective to make up for their lack of love for their parents [10].

2.1.3. Relevant Strategies for Mental Health Education for Left behind Children in Rural Areas

(1) Improving the importance of family education is an important way for a child to cultivate good qualities and behavioral habits, and establish a correct outlook on life and values. Therefore, family education is an indispensable way to solve the problem of mental health education for left behind children in rural areas [11]. In the process of children's growth, parents' guidance and education play a very important role [12]. So, when going out to work, if possible, parents should take their children with them or choose a suitable guardian to take care of them, so that they can keep track of their children at all times. In addition, people can also make more phone calls or video chats to child, which can facilitate better communication and help them solve problems. At the same time, parents should also maintain contact with school teachers in order to better understand their children and care about their growth.

(2) Improve relevant educational methods and focus on quality education

Some rural schools still use traditional teaching methods and only focus on improving students' academic performance. However, the importance attached to mental health education has been ignored. They simply believe that a simple ideological and moral education course can replace psychological courses, and they often overlook the problems that students encounter in their learning and life. Therefore, it is of great practical significance to carry out quality education, enrich extracurricular activities, improve interpersonal relationships between teachers and students, and promote the physical and mental health development of teachers and students in rural primary and secondary schools [13].

(3) Strengthen social education and improve the social care system

Encourage social caring people and social organizations to participate in the activities of caring for left behind children. The Communist Youth League, Women's Federation, Customs Working Committee, community education Committee and other organizations should actively organize caring people and volunteers. At the same time, they should improve the care system, teacher resource allocation and related management systems, and take full consideration of the future development of left behind children. It can optimize the social environment, clean up entertainment venues around schools, create a good learning environment for left behind children, enhance their learning enthusiasm, and promote their healthy growth. As a vulnerable group that lacks parental care for a long time, the issue of mental health education for left behind children in rural areas has become a hot topic of social concern [14]. It should start from the three levels of family, school, and society, care for and cherish left behind children, create a warm and healthy learning and living environment for them, let them establish a correct outlook on life, worldview, and values, let them better integrate into society, and become the backbone of motherland.

2.1.4. Reasons and Intervention Methods for the Formation of Psychological Problems in Children with Fear, Laziness, and Poor Execution Ability

In children's psychological activities, parental praise and attention can become effective promoters of good behavior. However, due to the absence of parents by their own side, the lack of safety protection and language encouragement when learning and trying new things can lead to timidity, fear, and even psychological shadows in children. Left behind children, without supervision in their learning and daily life, would develop a mentality of dependence. Over time, they would develop a lazy bad habit and their execution would become very poor. However, by intervening in students' physical activities, it is possible to educate and correct their unhealthy habits and behaviors, enabling them to develop good habits and receive more attention and praise, thereby reducing their mental health problems.

2.2. Different Sports Have an Impact on Children's Mental Health

Participating in more badminton activities can greatly help children's physical and mental health. According to a survey report, play badminton has a positive effect that cannot be ignored in improving children's thinking responsiveness [15]. After 6 months of training, the child's fast judgment time has been reduced from 0.3 seconds to 0.1 seconds. In addition, play badminton has a good effect on children's visual function. In badminton, continuous tracking of the fast movements of the badminton ball can effectively exercise the ciliary muscles, lenses, and suspensory ligaments of their eyeballs, which has a certain effect on preventing myopia in children and is also an effective auxiliary stage for treating children's inner vision. At present, with the rapid development of the national economy, technology, and information, children's lifestyles have also undergone significant changes [16]. Some children are no longer willing to participate in outdoor activities as they used to be. They begin to be exposed to various electronic products at a very young age, which leads to a decrease in their vision and physical exercise. The various advantages of badminton also have great benefits for the physical development of children, so children should be allowed to play play badminton more.

Aerobics can eliminate bad emotions and psychological barriers, and play an important role in mental health [17-18]. Sports activities have been proven by scientific research to have the effect of relieving psychological stress and preventing various diseases. Aerobics is a kind of sports characterized by beautiful movements, coordinated movements and comprehensive physical exercise, with a strong sense of rhythm. With the accompaniment of powerful and melodious music, aerobics training can shift the attention of students with mental problems from fidgety things to

other aspects, forget depression, enjoy the happiness of aerobics, gain peace of mind, relieve mental pressure, regulate the pressure in learning and life, make people energetic and maintain a good attitude [19-20]. Through group cooperation training, friendship can be enhanced, team awareness can be enhanced, and students can have a healthy physique, elegant temperament, cheerful personality, and face various challenges in their future lives.

3. Impact of Different Exercise Interventions on the Mental Health of Left behind Children in Rural Areas

This study used a questionnaire survey method to conduct a survey on 350 students from a primary school in Jiangxi Province in 2020 and 2021. A total of 296 valid survey questionnaires were collected. There are two classes in basketball class, aerobics class, taijiquan class, sports dance class, and tennis class, regardless of gender.

Survey tool: A survey was conducted using the Physical Self Esteem Scale for Children and Adolescents

The specific content includes: physical self-worth, exercise ability, physical condition, physical attractiveness, and physical fitness, totaling 30 questions.

Survey method: Distribute questionnaires uniformly on site, provide unified guidance for filling out the questionnaires, and after completing the questionnaires, collect them by discipline and class, as shown in Table 1.

The arithmetic square root formula and mean value formula of the variance of the survey data are as follows:

$$S = \sqrt{S^2} = \sqrt{\frac{1}{n} [(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_n - \bar{x})^2]} \quad (1)$$

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n} \quad (2)$$

Table 1: Analysis of differences in gender, grade, and subject

Gender	Male	71.4±10.23
	Female	65.12±10.11
Grade	One	71.12±11.99
	Two	67.78±13.08
Subject	Mathematics	70.46±12.43
	language	67.41±11.76

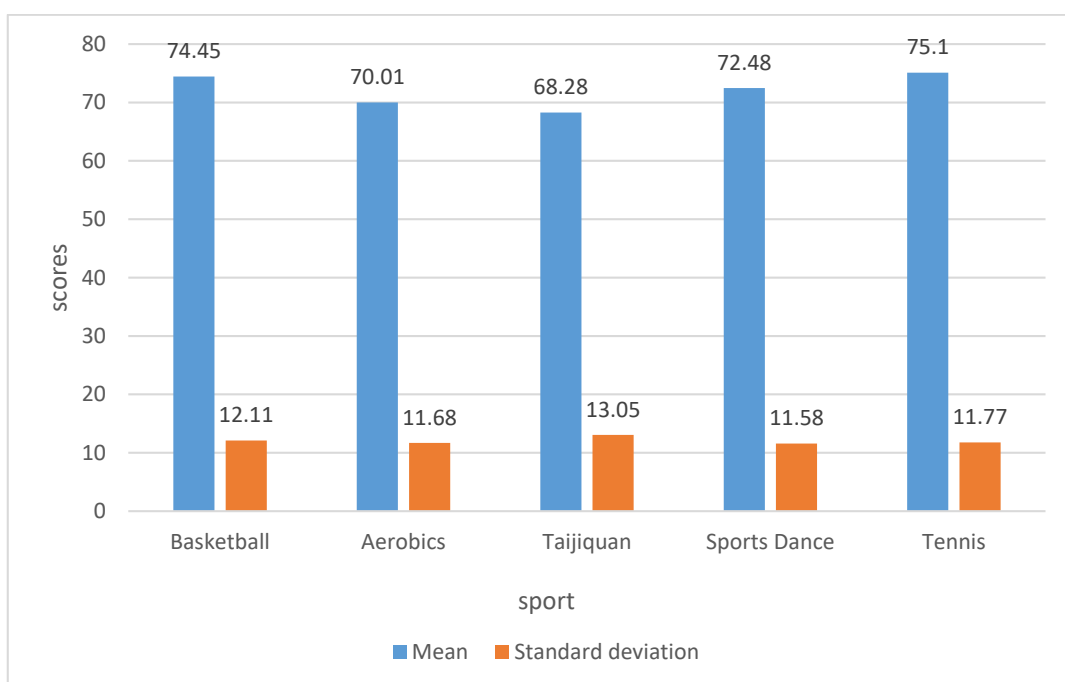


Figure 1: Mean and standard deviation of different projects

Through a questionnaire survey of 10 classes, it is found that basketball, tennis, aerobics, taijiquan, sports dance and other sports have no obvious differences in sports skills and physique. The research results in Table 1 indicate that there is no significant difference in the scores of the first and second grade students after training in each project class, and there is no significant difference in their mental health level. However, the scores of the self-esteem scale for students majoring in Chinese and mathematics are not significantly different, indicating that there is also no significant difference in their mental health level. There is no significant difference in gender between male and female students. By analyzing the mean and variance of each indicator, as shown in Figure 1, it can be concluded that in tennis matches, an average score of 75.10 points and a basketball average score of 74.45 points are the best. Next is sports dance, with an average score of 72.48 points, and aerobic gymnastics, with an average score of 70.01 points.

Table 2: Comparison of SCL-90 (Symptom Checklist 90) levels in the high-intensity running experimental group before and after the experiment

Indicators	Pre-experiment	After heavy exercise	Mean of difference
Somatization	1.44 ±0.59	1.34 ±0.44	0.235
Obsessive-compulsive symptoms	1.98 ±0.67	1.94 ±0.36	0.329
Interpersonal sensitivity	1.65 ±0.78	1.51 ±0.45	0.851
Depression	1.64 ±0.58	1.27 ±0.58	0.043
Anxiety	1.6 ±0.6	1.67 ±0.23	0.885
Hostility	1.62 ±0.68	1.8 ±0.32	0.955
Terror	1.53 ±0.53	1.09 ±0.52	0.057
Paranoia	1.73 ±0.65	1.74 ±0.33	0.794
Psychotic	1.87 ±0.54	1.26 ±0.42	0.038
Sleep Eating	1.76 ±0.3	1.22 ±0.36	0.033

Table 2 shows the impact of high-intensity running exercise on various factors of children's mental health: high-intensity running exercise has a significant impact on interpersonal sensitivity, anxiety, and hostility towards others; Children have an impact on somatization, paranoia, and obsessive-compulsive disorder; However, the improvement effect on sleep diet, psychiatric disorders, and depression is not significant.

Table 3: Comparison of SCL-90 levels in the medium intensity running experimental group before and after the experiment

Indicators	Pre-experiment	After moderate intensity exercise	Mean of difference
Somatization	1.33±0.44	1.4±0.28	0.679
Obsessive-compulsive symptoms	1.84±0.48	1.78±0.45	0.74
Interpersonal sensitivity	1.85±0.7	1.34±0.62	0.027
Depression	1.89±0.53	1.45±0.52	0.034
Anxiety	1.71±0.46	1.51±0.43	0.028
Hostility	1.53±0.45	1.46±0.46	0.275
Terror	1.39±0.39	1.3±0.31	0.148
Paranoia	1.62±0.49	1.35±0.45	0.044
Psychotic	1.38±0.41	1.52±0.51	0.831
Sleep Eating	1.88±0.34	1.32±0.26	0.044

Table 3 shows that moderate running exercise has an impact on various factors of children's mental health, but it has an improvement effect on alleviating the psychological effects of terror and hostility towards others. It also has a role in reducing interpersonal sensitivity, anxiety, depression, paranoia, and sleep and diet, but the effect is minimal. It has a significant improvement effect on somatization, obsessive-compulsive symptoms, and psychosis.

4. Conclusion

Childhood and adolescence are crucial stages of human growth and development. Therefore, when teaching and training wrestling, teachers and parents should follow the rules of children's growth and development, and pay attention to the limitations of biological factors on sports training. It is also necessary to pay attention to the psychological characteristics of each stage, make scientific and reasonable arrangements for this, fully utilize the diversity of wrestling teaching, and frequently use games and different types of exercises and competitions. Teaching and training should always be carried out in a pleasant atmosphere, in order to achieve the best training results. This article explores the positive effects of different exercise methods on the mental health of left behind children. Through experimental analysis, it can be seen that exercise can indeed reduce the negative psychological health problems of left behind children

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