THE EFFECTIVENESS OF MINI-FOOTBALL TRAINING PROGRAMME ON PHYSICAL AND COGNITIVE DEVELOPMENT OF PRESCHOOL CHILDREN IN SHANGRAO OF CHINA

Guan YingRong, Wei HuiSuan and Qiu Tian

Abstract **–In contrast to China's growing economy, which has placed great emphasis on children's health, statistics show worrying levels of physical and mental health among Chinese children. In order to promote the improvement of children's physical health and cognitive ability, to explore the effects of mini football training program on children's physiology and psychology, as well as the possibility of promotion and application in physical education, this paper adopts the method of questionnaire survey, interview, observation and experiment to analyze the application status of mini football training program in children's teaching. By comparing the test results of experiment class1(mini football project) experiment class2(game physical education course) and control class, it is expected to analyze the changes of children and draw a conclusion. It is expected to propose effective intervention methods to improve children's physical health and cognitive ability.**

Keywords **–Mini-football Training Programme；Physical；Cognitive；Preschool Children**

I. INTRODUCTION

1.1 Basic information

This chapter will elaborate on the topic to be studied, including research background, problem statement, research objectives, research problems, research assumptions, research significance, research limitations and terminology definitions.

1.2 Research Background

In 2016, the CPC Central Committee and The State Council issued the "Healthy China 2030" Plan Outline. On October 25, 2016, the CPC Central Committee and The State Council issued the "Healthy China 2030 Plan Outline", which is an action plan for promoting the construction of healthy China in the next 15 years. Put forward the guidelines, by 2030, to promote the health system more perfect, more harmonious health development, healthy lifestyles gained popularity, health improving continuously the quality of service and health care, health industry prosperity and development, the basic realization of health equity, the main health indicators in high-income countries, Life expectancy will increase by about three years to 79 years. By 2050, China will build a healthy country commensurate with a modern socialist country. Adhering to the principle of taking people's health as the centre, the Outline defines the main tasks of the Outline by closely focusing on the factors that affect health (including genetic and psychological biological factors, natural and social environmental factors, medical and health service factors, and lifestyle and behaviour factors). Including healthy living and behaviour, health services and security, healthy production and living environment and so on. Based on people's health as the centre, from internal to external, from the order of the main body to the environment, in order to personal life and behaviour, medical and health services and security, health impact factors such as production and living environment, put forward the popularization of healthy living, optimization of health services, improve the health care, construction environment, and healthy development of health industry in five aspects, such as strategic task.

The overall physical health level of children in China is declining year by year, while the physical health level of children in Jiangxi Province still lags behind the national level.

According to the fifth National Physical fitness Monitoring Bulletin released by the General Administration of Sport of China, 94.4% of children aged 3-6 passed the physical fitness standard in 2020.Compared with 2014, statistics in 2020 show that the average height, sitting height, weight and other levels of male and female children aged 3-6 have improved, while the average level of continuous jumping and standing long jump has decreased for males (1.3% -6.6%) and females (1.6% -5.3%).The literature shows that the physique qualification rate of children in Jiangxi province in 2018 is 83.6%, and many test indexes of children of the same age are lower than the national average. The height, weight, standing long jump and tennis throw of children of all ages are lower than the national average.

Chinese parents' excessive anxiety about their children's cognitive development. In China, children's education has always been the topic of most concern for parents. Chinese children are good at inheriting and their expectations for their children's success have never changed. From the enlightenment education of infants, to the entrance examination, to the college entrance examination or studying abroad, the range of parental anxiety in education has completed a one-stop layout from birth to graduation to society. And cognitive ability will greatly affect children's learning ability and academic performance. Faced with the pressure of fierce competition in school admission and employment, more and more parents realize the importance of the cultivation of children's cognitive ability, and more and more parents

Guan YingRong,City University of Malaya, Malaysia (Email address: gyr830930@gmail.com).
Wei Hui Suan, City University of Malaya, Malaysia (Email address:wei.hui@city.edu.my).
Qiu Tian, University of Malaya, Malaysia (Email address:229176981@qq.com).

have anxiety or even excessive anxiety in the development of children's cognitive ability.

Very few kindergartens in Shangrao carry out football courses for children, and even if they do, there are no sound teaching plans and development goals.

According to the field survey and questionnaire survey, very few kindergartens of all levels and types in Shangrao offer football courses. Among the 205 kindergartens surveyed, only 3 offer football-related courses, but none has completed teaching plans and development goals. Football was introduced into the classroom in a limited way rather than in a planned way. The reason is that there is no perfect curriculum system, no suitable site and no teachers who can carry out courses.

It is innovative and of practical significance to study the intervention effect of soccer program on the physical development and cognitive ability of 3–6-year-old children.

From the literature review, it is found that there are few literatures on the intervention effect of soccer program on the physical development and cognitive ability of 3-6 years old children. On the one hand, more studies have chosen basketball, dance and aerobic exercise for intervention. On the other hand, there are few studies on the effects of interventions on both physical development and cognitive ability. From the field and questionnaire survey, it is found that the PE curriculum of all levels and types of kindergartens in Shangrao is relatively simple and outdated, which cannot meet the comprehensive needs of children. The "mini football project" developed can improve this situation. As summarized, this study has innovative and practical significance.

This paper studies the influence of physical health on children's cognitive function, analyzes the possible biological mechanism of physical exercise on cognitive ability, and provides reference for promoting children's physical health development.

The level of cognitive development and performance of each individual is the result of a combination of many factors, including heredity factors and acquired environmental factors, among which, the acquired environmental factors, namely the lifestyle jointly created by the society, family and learning environment, physical activity level, diet and nutrition, sleep and rest, and health all affect cognitive performance to a certain extent. Animal experiments have shown that stress, aging, environmental reinforcement and physical activity all affect neurogenesis in the brain, and physical activity is the most critical neurogenic component.

Therefore, to explore the relationship between physical health and children's cognitive performance, to clarify the importance of physical health, to understand the long-term development of a specific brain structure can provide opportunities for environmental regulation through what kind of healthy behaviour, and to provide further evidence for the cognitive development of preschool children.

1.3 Problem Statement

In 2020, the physical qualification rate of children aged 3-6 in China was 94.4%. Compared with 2014, statistical data in 2020 showed that the average level of children aged 3-6 in both male and female continuous jump and standing long jump decreased, with males (1.3% -6.6%) and females (1.6% -) -5.3%) (from: "The Fifth National Physical Fitness Monitoring Bulletin").

In 2018, the fitness pass rate of children aged 3-6 in Jiangxi Province was 83.6%, among which speed and lower limb strength were lower than the national average (Source: Physical health status of 3–6-year-old children in Jiangxi Province [J] Chinese School Health,2018,10 (39).

Literature shows that children aged 3-6 in Jiangxi province are lower than the national average in terms of overall fitness pass rate, body shape and physical quality. The main reasons are as follows :(1) jiangxi province is an economically underdeveloped area, and the diet in kindergartens is relatively single, especially in rural kindergartens, which can hardly be guaranteed, affecting the healthy growth of children;(2) Jiangxi province is also a major province of labour output, resulting in many left-behind children, especially in rural areas, which greatly reduces the possibility for families to improve children's educational cognitive ability and develop scientific sports habits, thus affecting children's physical health;(3) The implementation of kindergarten physical education curriculum is not standardized, and there are insufficient activity time, insufficient sports venues, insufficient teaching teachers and monotonous courses, which seriously affect the quality of physical education curriculum and the effect of physical intervention on children.

Cognitive ability in early life affects learning, academic achievement and classroom behaviour and prevents cognitive decline in middle age and beyond, affecting individuals' lifelong achievement, health and quality of life.

The early school age is the "golden period" of cognitive development, which is the critical period when the brain develops and the central nervous system is the most plastic and sensitive to external stimuli. The early cognitive process and its neural matrix lay the foundation for successful learning and academic achievement, thus affecting the health and happiness of an individual throughout his or her life.

1.4 Research Objectives

Explore the influence of mini football training program on preschool children's physical health.

Mini football training project refers to the training of children's basic football skills and physical quality under the principle of contextualization and gamification, so as to improve children's physical and mental development level. Physical health is serving the public, applicable to all individual race, social status, gender, age, and as the physical quality and health level testing, evaluation, supervision, and the theoretical basis of the analysis is the general public to maintain health, reduce disease and to improve the efficiency of daily life, work, study the positive pursuit of health. Physical health test indicators are divided into three categories: body shape, body function and body quality indicators. According to the provisions of "National Physical fitness Measurement Standard Manual (Part of children)", this paper will discuss the intervention effect of mini football program on

preschool children including height, weight, sitting forward bend, tennis throw distance, 10 meters back and forth run, continuous jump on both feet, standing long jump and balance beam walking.

Analysis of the influence of special football courses on children's body shape.

Features a young football course as an example, to carry out preschool physical education empirical research, analysis of children's football characteristic course effect on infant's body form, and the experimental group and control group of young children's height, sitting height, body weight, chest circumference indicators to measure, from the perspective of empirical analysis of children's football characteristic course impact on children's body shape.

Analysis of the influence of special football courses on children's physical function.

Bodily function is the whole that points to the person and the life activity that place of each organ, system displays, evaluate through the index of level of function of reflection heart and lung commonly, wait like capacity of heart rate, lung, blood pressure. The heart rate at rest is the main index to measure the physical function of children. Children's cardiovascular system develops faster, and the heart rate at rest can simply and effectively reflect the development level of children's cardiovascular system. Babies' heart rates are faster, around 130 beats per minute, but they slow down as they age and approach adult levels by adolescence. The development of children's heart is not perfect, the contraction ability of myocardium is poor, the heart capacity is small, the output of each stroke is little, and the metabolism is very vigorous, only by speeding up the frequency of heart beating to increase the output of the heart to adapt to the needs of the body, the younger the age of children, the faster the heart rate. Therefore, early childhood is not the key period to develop endurance quality, but appropriate endurance exercise is to promote cardiovascular development. This topic takes the characteristic course of infant football as an example, carries out the empirical research of infant physical education, and analyzes the benefit of the characteristic course of infant football to promote the development of infant physical function.

Analysis of the influence of special football courses on children's physical fitness.

The speed, endurance, strength, sensitivity, flexibility, balance and coordination of the functions of human organs and systems in muscle work are collectively referred to as physical quality. Physical quality is the basis of human activities, and it is closely related to our daily work ability, health level and sports ability. In the manual of National Standards for Physical Fitness measurement (part for children), the physical fitness indicators of children are standing long jump, tennis throw, 10-meter round run, continuous jump on both feet, sitting posture, forward bending and balance beam walking.3-6 years old is the sensitive period of rapid development of physical quality, according to the characteristics of children's physical development, reasonable arrangement of physical activities, to promote the development of children's physical quality is very important. This topic proposed features a young football course as an example, to carry out preschool physical education empirical research, and the experimental group and control group of young children's standing long jump, tennis throw far, a reverse layup 10 meters, feet jump, sit before body bends and balance beam is measured, from the perspective of empirical analysis of the characteristics of football course for kindergarten physical effects.

Explore the influence of mini-football training program on preschool children's cognitive ability.

Cognitive ability refers to the ability of human brain to process, store and extract information. It is a kind of advanced psychological function and the most important psychological condition for individuals to successfully complete activities. Including the ability to perceive, remember, pay attention, think and imagine. This paper will explore the intervention effect of mini-soccer program on preschool children's cognitive ability.

Cognitive ability was measured at follow-up. The "Chinese-Wechsler Early Childhood Intelligence Scale (C-WYCSI)" was selected, which conforms to the development characteristics of pre-schoolers at the present stage and has been proved to have good reliability and validity in the measurement of Chinese children's intelligence and has been widely used. The "Children's Intelligence Simple Test" is based on the "Simplified Manual of China revised Wechsler Intelligence Scale" (hereinafter referred to as the "manual"), which selects the most representative and frequently used knowledge, picture vocabulary, picture filling, and wood block pattern.

Explore the influence of game-based physical education courses on preschool children's physical development.

Game sports course: it refers to the course that develops children's basic physical ability through various sports games and makes children's body and mind happy. This paper will discuss the intervention effect of game based physical education courses on preschool children's eight indicators, including height, weight, sitting forward bend, tennis throw distance, 10-meter round-trip run, continuous jump on both feet, standing long jump and balance beam walking.

Explore the influence of game-based physical education courses on preschool children's cognitive ability.

This paper will explore the effects of game-based physical education courses on preschool children's cognitive abilities including perception, memory, attention, thinking and imagination.

Explore the correlation between children's physical health and cognitive ability.

In the past few years, research on the relationship between physical health and cognitive ability of children and adolescents has attracted increasing attention. Children with higher level of physical health have higher intellectual maturity, attention system efficiency, greater cortical activation, better academic performance and cognitive performance. Throughout the domestic and foreign studies, both physical health as a whole and its components show positive effects on brain structure, function and cognitive ability. However, there are still some deficiencies in the current research. First, most of

the studies were cross-sectional studies with low level of evidence. Secondly, although there are a few longitudinal studies designed, the follow-up time is short. Finally, the independent effect between the two remains to be determined. In this paper, the correlation analysis between the two will be conducted based on experimental data. The research results will further enrich the understanding of the relationship between preschool children's physical health and future cognitive ability, and provide reference for the study of cognitive development in early life.

1.5 Research questions

What is the soccer ability of the subjects before intervention? Before experimental intervention, the football ability of the experimental object was tested to clearly understand the football level of the experimental object.

How is the game completion ability of the subjects before intervention?
Before experimental intervention, the game completion ability of the subjects was tested to clearly understand the game completion level of the subjects.

What is the physical health level of subjects before experimental intervention? Before experimental intervention, the experimental subjects were tested on 8 indicators, including height, weight, sitting forward bend, tennis throw distance, 10-meter round-trip run, two-foot continuous jump, standing long jump and balance beam walk, so as to clearly grasp the physical health level of the experimental subjects.

What is the cognitive level of subjects before intervention? Before experimental intervention, children's verbal IQ, operational IQ and full-SCALE IQ were evaluated by the urban version of "C-WYCSI", so as to clearly grasp the cognitive ability level of the subjects.

How is the soccer ability of the subjects after experimental intervention? After the experimental intervention, the soccer ability of the experimental subjects was tested again to compare the experimental intervention effect.

How is the game completion ability of the subjects after experimental intervention? After the experimental intervention, the game ability of the subjects was tested again to compare the experimental intervention effect.

What is the physical health level of the subjects after experimental intervention? After experimental intervention, the experimental subjects were tested on 8 indicators including height, weight, sitting forward bend, tennis throw distance, 10-meter round-trip run, continuous jump on both feet, standing long jump and balance beam, in order to compare the experimental intervention effect.

What is the cognitive ability of subjects after experimental intervention? Before experimental intervention, children's verbal IQ, operational IQ and full-scale IQ were evaluated by the Urban version of "C-WYCSI" to compare the effects of experimental intervention.

What is the impact of mini-football training program on children's physical health? Compare the score of physical health test data of children who completed the mini-football training program before and after the experiment, and explore whether there is a significant difference between the two results.

What is the impact of mini-football training program on children's cognitive ability? Compared the scores of cognitive abilities of children who completed the mini-football training program before and after the experiment, to explore whether there is a significant difference between the two results.

What is the impact of game-based physical education courses on children's physical health?
Compare the score of physical health test data of children who finished the game based physical education course before and after the experiment, and explore whether there is a significant difference between the two results.

What is the impact of game-based physical education courses on children's cognitive ability? Compare the scores of cognitive ability related scales of children who complete the games-based physical education courses before and after the experiment, and explore whether there is a significant difference between the two results.

1.6 Research Hypothesis

Although the details need to be further explored, the majority of current studies have generally confirmed physical activity. It can effectively promote the development of children's physical health and cognitive ability. In addition, the mini-football training program is more scientific and practical than the game-oriented physical education courses. Therefore, based on the previous research of scholars, the following hypotheses are proposed in this study:

1.6.1 Mini-football training program is positively correlated with children's physical development level

1.6.2 Mini football training program is positively correlated with children's cognitive ability

1.6.3 Games are positively correlated with children's physical development level

1.6.4 Game-based physical education courses are positively correlated with children's cognitive ability

1.6.5 Mini-football training has a more significant impact on children's physical development than games

1.6.6 Children's physical development level is positively correlated with children's cognitive ability

1.7 Significance of the study

Explore the intervention effects of mini football training programs and traditional sports games to enrich the kindergarten physical education curriculum system.
5-6 years old children is an important stage of physical and psychological development. In this stage is the peak of children's physical and mental development, the change and development of psychological indicators are easily affected by the outside world. Mini football training project can promote the development of kindergarten sports activities; At the same time, physical training has enriched the theoretical system of children's physical exercise, enriched the teaching methods and evaluation system of children's curriculum, provided support and help for the development of early childhood education, and has universality and can be extended. Undoubtedly, it

also contributes to the development of campus football theory in China.

To study the influence of physical exercise on children's cognitive function, analyze the possible biological mechanism of mini-football training program and traditional sports games affecting children's cognitive ability, and provide reference for promoting the good development of children's cognitive ability.

At present, children's physical training or children's fitness training has been widely popularized and well developed at home and abroad, and has played a certain role in promoting the physical and mental health of participants. However, in the former people's selection of research objects, more choices are primary and secondary schools and college students, and few in the early childhood stage. In the research process of physical training, this study combined with the characteristics of children's physical and mental development and physical training, through the impact on children's cognitive ability of experimental research, embodies the value of the new training mode for children's exercise, and analyses its biological mechanism.

The research results will further enrich the understanding of the relationship between preschool children's physical health and future cognitive ability, and provide reference for the research on cognitive development in early life.

The positive effect of physical health on cognitive ability has been fully confirmed, but most of the studies on preschool children are cross-sectional studies with low level of evidence, and few longitudinal studies. Secondly, though there is a longitudinal study of a small amount of design, but the follow-up time is shorter, and the research also has many shortcomings, such as a large part of the study will not physical health as a whole to study, only in view of the two aspects of cardiopulmonary endurance and body composition, research is not comprehensive, some studies are inconsistent physical test methods, such as academic performance reflects the cognitive problems, The rationality of the design is controversial. Finally, the independent effect between the two needs to be further verified.

Based on the current research status, this study adopts longitudinal follow-up study to explore the longitudinal correlation between preschool children's physical health and their cognitive ability three years later. To further explore whether the relationship exists independently of baseline cognition level. The results of this study will further enrich the understanding of the relationship between preschool children's physical health and future cognitive ability, and provide a reference for the study of cognitive development in early life.

1.8 Scope and limitations of the study

Scope of the study: Kindergartens in Shangrao City, Jiangxi Province. As there are many factors affecting children's physical development and cognitive ability, how to minimize the influence of other factors on experimental results requires good design and the coordination of home. Due to the influence of objective factors, the experiment period can only be set as a complete semester, i.e., four months. Otherwise, winter or summer vacation is not conducive to eliminating the interference of other factors on the experiment.

1.9 Definition of terms

Preschool children: refer to children who have not reached school age, generally 3-6 years old.

Mini football training program refers to training children's basic football skills and physical quality under the principle of contextualization and gamification, so as to improve children's physical and mental development level.

Game-based physical Education Course: Game-based physical education course refers to the course that develops children's basic physical ability through various sports games and makes children feel happy physically and mentally.

Physical development level: including physique, body shape, posture, nutritional status, body composition, etc.

Physical fitness: including speed, strength, endurance, sensitivity, coordination, walking, running, jumping, throwing, climbing and other basic physical activities.

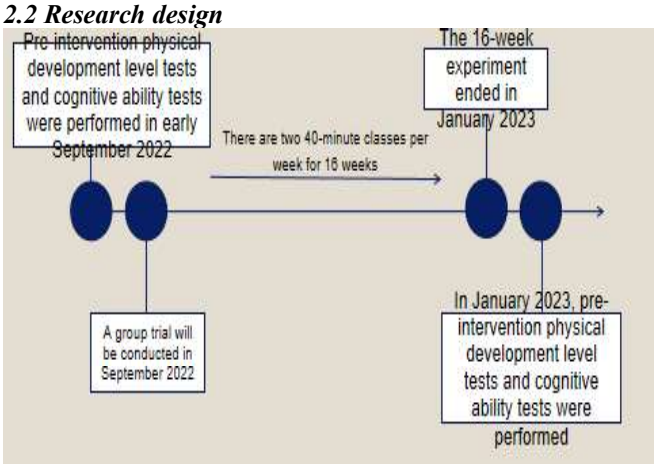
Cognitive ability: refers to the ability of human brain to process, store and extract information. It is a high-level psychological function and the most important psychological condition for individuals to successfully complete activities. Including the ability to perceive, remember, pay attention, think and imagine.

II PROBLEM STATEMENT

2.1 Introduction

This chapter will elaborate from eight aspects: research design, site, population and sample, research tools, instruments, preliminary study and summary.

2.2 Research design



2.3 Location, population and sample

Location: Shangrao City, Jiangxi Province. There was no significant difference in physical fitness and cognitive ability of 90 4–5-year-old children in no.3 Kindergarten of Xinzhou District, Shangrao City, Jiangxi Province. Among them, 45 are boys and 45 are girls. All subjects were normally developing children with normal vision or corrected vision, right-handed, and free of cardiovascular disease, intellectual disability, and mental

disorders. The reason why we choose this kindergarten as the experimental garden is that, on the one hand, the site conditions of this kindergarten are better, which is suitable for football teaching; on the other hand, the overall quality of teachers and parents in this kindergarten is higher, and the coordination degree is higher, which is conducive to reducing the experimental interference factors. Children were divided into three groups: experimental group (football), experimental group (games) and control group, with 30 children in each group.

2.4 The instrument

Physical health test indicators are divided into three categories: body shape, body function and body quality indicators. China's 3-6 years old children's physique test is mostly based on the "National physique measurement standard" (children part), the standard test index includes body shape (height, weight) and physical quality (10 meters run, standing long jump, tennis throw, two feet continuous jump, sitting forward bend and walk balance beam) eight items. This measurement standard does not include items to measure the level of physical function, and cardiopulmonary fitness is considered to be the most important element in physical health, so this study included cardiopulmonary fitness assessment into the physical health assessment index. The 10-meter round trip is a good test of cardiopulmonary fitness and has been used extensively in previous studies of this type. Therefore this study according to the situation of 3 ~ 6 years old children's physical development and load level, from the security, validity, reliability and efficiency of testing the various consideration, choose body composition (height, weight) as indicators of physical development, cardiorespiratory fitness running back and forth (10 meters) as indicators of physical function, strength, endurance and speed sensitive quality as indicators of body quality and movement ability, To comprehensively evaluate the physical health level of children. According to "National physical fitness Manual" (infant part), the sum of standardized scores was recorded as comprehensive physical health score.

"Chinese Wechsler child scale of Intelligence(c-wycsi)" is consistent with the development characteristics of preschool children in China at the present stage. It has been proved to have good reliability and validity in the measurement of Intelligence of children in China and is widely used in China. The scale is suitable for 4 ~ Children at the age of 6.5 years old are consistent with the age of subjects in this study, so they can be used for cognitive tests in this study.

2.5 Research Tools

SPSS19.0 statistical software was used for statistical analysis of the collected data. The analysis results were expressed as mean + standard deviation (M±SD). Before the experiment, one-way ANOVA was used to observe whether the scores of the three groups were homogeneous. Then, the levels of physical development and cognitive scores of the three groups before and after exercise were repeated measures ANOVA.$P < 0.05$ is considered significant, $P < 0.01$ is considered very significant.

2.6 Preliminary study

The preliminary study was conducted using "The Role of Physical Education in Promoting Physical and Cognitive Development" and "The Role of Physical Education in Promoting Physical and Cognitive Development". These two documents facilitate the execution of the pilot study, consistent with the effective identification of information relevant to the level of partial physical and cognitive development of young children.

2.7 Summarize

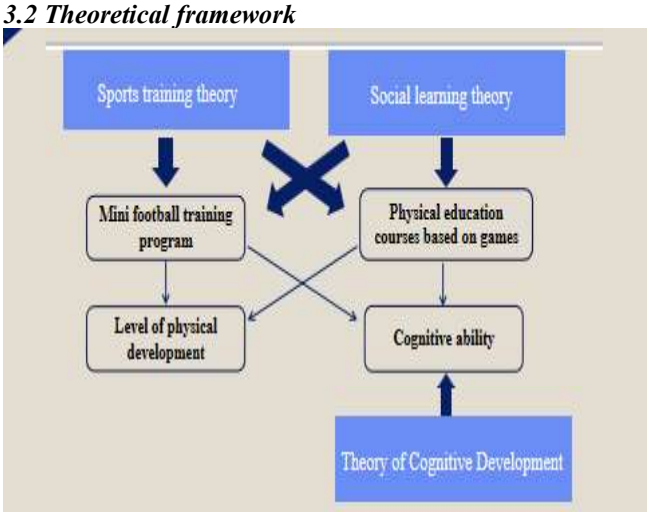
Study methods marked the identification of study designs based on pre-intervention physical development level tests, cognitive tests, and group experiments. The sample of participants included 45 boys and 45 girls, all aged between 4 and 5, from Xinzhou District, Shangrao City, Jiangxi Province. SPSS 19.0 software helped estimate mean, standard deviation and one-way ANOVA.

III. LITERATURE REVIEW

3.1 introduction

The study identified possible health problems that people, particularly pre-schoolers, face due to a lack of proper physical and cognitive development. （Dong et al. 2020) argue that this research is supported by issues identified in the Healthy China 2030 programme outline. Young children have been facing health problems, which can be identified by comparing the level of physical health with the government's expectation of national levels. The study identified these problems and linked the need for physical activity to promote physical and cognitive development.

3.2 Theoretical framework



3.3 Identify health problems of preschool children

The many physical and mental health benefits of physical fitness are well known among children and adolescents. Physical health is now considered one of the most important health indicators and is a predictor of overweight, obesity, cardiovascular disease morbidity and mortality. It is also currently recognized as a strong predictor of health during childhood, adolescence and later life. Physical health is associated with several related health: each composition such as lower systemic and

central obesity, low levels of traditional and emerging cardiovascular disease risk factors, better bone health, reduce fatigue, and cancer survivors a better quality of life, better psychological health, especially depression, anxiety, emotional state, and self-esteem.

Preschool or young children urgently need to improve their health and physical fitness. The average health status of children in Jiangxi province is lower than the national level (Charach et al., 2020). The decline in the health of young children (preschool) is a major concern. Parents are very concerned about the declining health of their children, and they need some proper solutions. The health problems found in preschool children are unhealthy diet, uneven strength development and lack of physical activity. Unhealthy eating habits are common in toddlers and young children. They can eat anything at any time, which may affect the health of young children. Another major problem for pre-schoolers is the lack of all-round development, which leads to the children's physical weakness. The lack of strength weakens body structures, mainly the hands, legs and joints, allowing the child to grow normally. Lack of physical activity is another major concern for young children, and the main effects of such health problems are excess fat, high cholesterol, diabetes and blood pressure (Xiao Fang et al., 2018). Young children who are not physically active are at risk for obesity and, later in life, for the health problems described above, including knee pain and physical problems caused by weight problems.

To sum up, physical health is closely related to health. Children's physical health is determined by their lifestyle, Markers of cardiovascular and metabolic health and mental health status are also predictors of future chronic disease risk.

3.4 Ways to improve physical and cognitive development

According to literature review, children's cognitive ability has a great impact on children and adolescents' learning ability. The level of cognitive ability is influenced by genetics, environment and education, but most researchers believe that Nurture plays a major role. Cognitive neuroscience research believes that human brain structure and function than any animal. Complex, greatly influenced by external forces, through learning and practical activities and other factors, the structure of the brain and function is constantly evolving and changing. In his research, Liu Jian believes that colour enlightenment education is an important means to cultivate children's cognitive ability and artistic talent. For the cultivation of children's cognitive ability, he starts from three aspects: intuitiveness, inspiration and development. Principles are discussed. Wang Bing believes that preschool children have strong imitation ability and curiosity, and are in the most active state of preparation and acceptance. He believes that painting courses play an important role in children's cognitive development, mainly from start with the development of children's visual cognitive ability, promote the development of children's visual cognitive ability.

Young children's development can be improved by including exercises that target them and improve them as a whole. There are milestones in early childhood development that can help parents track their child's proper development.

Figure: Developmental milestones for children aged 2-5(Credit: Lindahl et al., 2018, PP-85). Physical skill development can be improved by playing a variety of outdoor games and sports with children (Lisdahl et al., 2018). Games like soccer, catch, park rides, running and jumping can help improve a child's physical development. Children can get a moderate amount of physical activity by playing these outdoor games regularly for 1-2 hours. This will help to improve their physical strength and endurance for lasting work and study. Cognitive development is possible by ensuring that young children develop skills that follow a set of commands. This can be done from an early stage in a child's life by having them sort colours and shapes, follow instructions, make toys, recognise and write letters and numbers (Jeffries et al., 2021). This understanding can be improved by basic mathematical calculations (addition, subtraction, multiplication and division).

3.5 The role of exercise in improving physical and cognitive development

Sports such as catching, cricket, football, baseball and basketball can help young children develop physical and cognitive skills (Contreras-Osorio et al., 2021).Young children can develop physical skills by running, throwing, catching and swinging a bat, as it can provide them with appropriate outdoor activities to improve their strength. These movements ensure that children are able to adjust and develop specific skill sets, using eye vision and reflexes to integrate control of their limbs. Through the application and development of logical thinking, children are able to work as a team and play responsibly. It can help their cognitive development by ensuring proper communication and following strategies. Niederer tested the aerobic capacity and motor capacity of per-schoolers between the ages of 4 and 6 and found that children with higher aerobic capacity and motor capacity showed better memory and attention after a follow-up of 9 months. Donnelly gave children a moderate-intensity physical activity intervention and found that those who received the intervention performed better on reading, spelling, math and intelligence tests than those who did not. Caterno performed better in short-term memory and little change in long-term memory by setting up an experimental group and a control group to do aerobic exercise for 15 minutes a day and a control group to exercise only daily.

3.6 The influence and mechanism of physical health on cognitive ability

Each individual cognitive development level and cognitive performance is the result of comprehensive shaping of many factors, including genetic factors and acquired environment factors, which acquired social environment factor is the individual life, family, life style, level of physical activity, diet, sleep and rest, health to a certain extent, affected the cognitive performance. Animal studies have shown that stress and aging, as well as environmental reinforcement and physical activity, are the

most critical neurogenic components. In a review, Chang. Studies by Et al. have shown that health is one of the links between physical activity and cognitive ability and is an important regulatory factor. Therefore, exploring the relationship between physical health and children's cognitive performance and clarifying the importance of physical health can help to understand the long-term development of specific brain structures and what healthy behaviours can be acquired through the ring environmental regulation provides an opportunity for further evidence of preschool children's cognitive development. Researchers at home and abroad dedicated to the study of acquired behaviour factors on the influence of early childhood cognitive process, because the key to assist the selection process the prefrontal cortex and hippocampus neural structure throughout the entire childhood, in addition, early cognitive process and its neural substrate which laid a foundation for successful learning and academic achievement, thus affecting the individual health and well-being of life. Existing cross-sectional studies suggest that the relationship between physical fitness and cognitive vitality may first be established in children. A deeper understanding of the relationship between physical health and the brain at the beginning of life can improve the relationship between physical health through physical exercise programs, with positive effects that may extend beyond physical health to cognition and the brain. The state of health of pre-schoolers predicts intellectual maturity. Increased time spent in physical education can boost a child's early cognitive skills. Physically fit children had greater cortical activation and corresponding cognitive performance. Hogan. Says physical fitness can improve cognitive performance by making the attention system more efficient. When Zhong Yunhui et al. studied the relationship between physical health, executive function and academic performance of primary school students, they found that physical health has an important impact on academic performance. There are few longitudinal studies on physical health and cognitive ability, but baseline physical health has a positive influence and predictive effect on cognitive performance of both preschool and adolescents.

3.7 Summary and literature gap

The literature helps to determine the health status of children (preschool children) and the possible problems they face. Some of the health problems identified in the study were unhealthy diets, uneven strength development and lack of physical activity, which can lead to diseases such as excess fat, high cholesterol, diabetes and blood pressure later in life. Sports like football, baseball, and track and field can help support healthy, steady growth and cognitive development in young children. These sports games are very supportive to maintain the continuous improvement of children's cognitive and healthy development.

REFERENCES

Bulca, Y., Ozdurak, r.h., & Demirhan, g. (2020).The influence of digital physical exercise video on pre-school children's motor skills learning.*European Journal of Early Childhood Education Research*, 28(2), 231-241.

Battaglia, G., Alesi, M., Tabacchi, G., Palma, A., & Bellafiore, M.(2019).Development of motor and pre-reading skills in preschool children's physical education program: a non-randomized pilot trial.*Frontiers in Psychology*, 92694.

C, K LWang, j. G.Liu, Z., Zhu, L. N. Xiong , X., Klich,S.And...& Chen, A.G. (2020).Mini basketball training program improves physical fitness and social skills of preschoolers with autism spectrum disorders. *Journal of human dynamics*, 73,267.

Charach, A., Mohammadzadeh, F., Belanger, S. A., Easson, A., Lipman, E. L., McLennan, J. D., ... & Szatmari, P. (2020). Identification of preschool children with mental health problems in primary care: systematic review and meta-analysis. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, *29*(2), 76.

Contreras-osorio, F., Campos-Jara, C. Martinez-Salazar, C. Chirosa-Rios, L. And Martinez-Garcia, D., 2021.Effects of exercise-based interventions on executive function in children: a systematic review and meta-analysis.*Brain Science*, 11(6), p. 755

Dong, B., Zou, Z., Song, Y., Hu, P., Luo, D., Wen, B., ... & Patton, G. C. (2020). Adolescent health and healthy China 2030: a review. *Journal of Adolescent Health*, *67*(5), S24-S31.

Frank, m.l., Flynn, a., Farnell, g. S., & Barkley, j. e. (2018) differences in physical activity levels among preschoolers during free play and structured play periods.*Journal of Exercise Science and Fitness*, 16(1), 37-42.

Gao,Z, Zeng, Qing-hong,N, Pope, Z. C, Wang R, F & Yu(2019).The influence of sports games on motor skills, perception and physical activity of preschool children.*Journal of Exercise and Health Science*, 8(2), 106-113.

Garcia-hermoso, A., alonso-martinez, a.m., ramirez-velez, R., & Izquierdo, m. (2020).Effects of exercise interventions on health-related physical fitness and blood pressure in preschoolers: a systematic review and meta-analysis of randomized controlled trials.*Journal of Sports Medicine*, 50(1), 187-203.

Huck, C., Ketelhut, S., Wendt, U. Muller, G., Schlesner, C., & Ketelhut, K.(2019).Effectiveness of physical activity interventions for preschool children: a cluster-randomized controlled trial.*Scandinavian Journal of Medicine and Sports Science*, 29(5), 742-752.

Honrubia-montesinos, C., Gil-Madrona, P., & Losada-Puente, L.(2021).Motor development in Spanish preschoolers. *Children*, 8(1), 41.

Jones, D., Innerd, A., Giles, E. L., & Azevedo, L.B. (2020).Associations between early basic motor skills and physical activity: a systematic review and meta-analysis.*Journal of Exercise and Health Sciences*.

Jeffries, a.c., Marcora, S.M., Coutts, A.J., Wallace, L., McCall, A., and Impellizzeri, f.m., 2021.Develop a revised physical training conceptual framework for research and practice .*Sports Medicine*,pp.1-16

Ji M, Tang,Y, zou, J., zhou, G.Deng, J.And...& Lin Qiang (2018).The relationship between obesity, sleep and physical activity in Preschool children in China.*International Journal of Environmental Research and Public Health*, 15(3), 527.

Jaksic, D., Mandic, S., Maksimovic, N., Milosevic, Z., Roklicer, R., Vukovic, J.,...& Drid, p. (2020).Effects of 9-month physical activity intervention on morphological characteristics, motor and cognitive skills of preschool children. *International Journal of Environmental Research and Public Health*, 17(18), 6609.

Ketelhut, S., Ketelhut, S. R., & Ketelhut, K.(2020).School-based exercise interventions improve blood pressure and arteriosclerosis parameters in children: a randomized controlled trial. *Journal of Pediatric Sports Science*, 33(1), 1-7.

Lisdahl, K. M., Sher, K. J., Conway, K. P., Gonzalez, R., Ewing, S. W. F., Nixon, S. J., ... & Heitzeg, M. (2018). Adolescent brain cognitive development (ABCD) study: Overview of substance use assessment methods. Developmental cognitive neuroscience, 32, 80-96.

Laur, H (2020).The impact of physical education on athletic ability in children and adolescents: a systematic review and meta-analysis.*Sports*, 8 (6), 88.

Lee, J.T, chu, t. l. A.& gu x (2020).The influence of demand support motor skill intervention on children's motor skill ability and physical activity.*Children*, 7 (3), 21.

Latorre- Roman, p.a., Mora- Lopez, D., & Garcia - Pinillos, f. (2018).The influence of school sports activities on preschool children's health.*Children: Nursing, Health and Development*, 44(3), 427-432.

Maatta, S. Gu,J., ray C, polyl, Nislin M, Sajaniemi N.And...& Roos, e. (2019).Children's physical activity and the preschool physical environment: the moderating role of gender.*Quarterly Journal of Early Childhood Research*, 47,39-48.

Navarro-paton, R., Brito-Ballester, J., Villa, S. P., Anaya, V., & Mecias-Calvo, M.(2021).Changes in athletic ability of 4 - and 5-year-old preschoolers after a brief physical education intervention program.*International Journal of Environmental Research and Public Health*, 18(9), 4988.

Pate, R. R., Hillman, C., Janz, K., Katzmarzyk, P. T., Powell, K. E., Torres, A....& Advisory Committee on Physical Activity Guidelines 2018.(2019).Physical activity and health in children under 6 years of age: a systematic review.*Medicine and Science in Sports and Exercise*, 51(6), 1282.

Popovi level, B.,Cvetković ,M, Horse čak, D, š epanović,T., Č okorilo, N., Belić, A.,...& Bogataj Š.(2020).A 9-month structured multiactivity program improves physical fitness in preschoolers: a quasi-experimental study. *International Journal of Environmental Research and Public Health*, 17(14), 4935.

Pate, R. R., Hillman, C., Janz, K., Katzmarzyk, P. T., Powell, K. E., Torres, A....& Advisory Committee on Physical Activity Guidelines 2018.(2019).Physical activity and health in children under 6 years of age: a systematic review. *Medicine and Science in Sports and* Silva-santos, S., Santos, A., Duncan, M., Vale, S., & Mota, J.(2019).The relationship between moderate and vigorous physical activity and gross motor coordination in preschool children.*Journal of Sports Learning and Development*, 7(2), 273-285.

Webster, E. K., Martin, C. K., & Staiano, A. E. (2019). Fundamental motor skills, screen-time, and physical activity in preschoolers. Journal of sport and health science, 8(2), 114-121.

Wick, K., Kriemler, S., & Granacher, U.(2021).Influence of strength-based exercise programs on physical health and cognitive performance of preschool children.*Journal of Strength and Fitness Training*, 35(4), 983-990.

Xiao-Fang, W. A. N. G., Jiao, L. U., Xiao-Xia, L. I. U., & Ting, D. A. I. (2018). Epidemiological features of hand, foot and mouth disease outbreaks among Chinese preschool children: a meta-analysis. Iranian journal of public health, 47(9), 1234.

Xin, F.Chen, s. T.C.In Hong Kong, J.T.Liu, Y.,& Cai Y. J. (2020).The relationship between basic motor skills and physical activity in preschool children: a systematic review.*International Journal of Environmental Research and Public Health*, 17(10), 3566.

Xu, C., Quan, M., Zhang, H., Zhou, C., & Chen, P. (2018). Impact of parents' physical activity on preschool children's physical activity: A cross-sectional study. *PeerJ*, 6, e4405.

Zhang Wen,X, Y, Z, Zhao,W, Jie,J., & pack, l (2018).Effects of mini-trampoline on executive *Exercise*, 51(6), 1282.

Reilly, j. J., Hughes, a.r., Gillespie, J., Malden, S., & Martin, a. (2019).Early physical activity interventions aimed at reducing the risk of later obesity and related Noncommunicable diseases: a rapid review of systematic reviews. *Obesity Review*, 20, 61-73.

Robinson, L. E., Palmer, K. K., Wang, L., Scott-Andrews, K. Q., Chinn, K. M., Sur, I., ... & Miller, A. L. (2023). Protocol for a cluster randomized clinical trial of a mastery-climate motor skills intervention, Children's Health Activity and Motor Program (CHAMP), on self-regulation in preschoolers. *Plos one*, *18*(3), e0282199.

Sando, O. J., & Sandseter, E. B. H (2020).ECEC supports physical activity and well-being in outdoor environments. *Journal of environmental psychology*, 69,101430.

Sun, X., Li, Y., CAI, L., and Wang, Y.(2021).Effects of physical activity interventions on cognitive performance in overweight or obese children and adolescents: a systematic review and meta-analysis.*Pediatric Research*, 89(1), 46-53.

function of preschool children.*International Biomedical Research*, 2018.