

The Effect of Practicing Contact Martial Arts on Children's Physical Fitness and Physical Quality

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Abstract. It is found in this paper that practicing Contact Martial Arts has a positive impact on children's physical fitness and physical quality, which provides a reference for the implementation of Contact Martial Arts.

Keywords: Children, Contact Martial Arts, Taekwondo, Physical Fitness, Physical Quality

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Children are the foundation of future social development and each country's future is in the hands of children, therefore, only when children own excellent physical conditions and strong bodies, and with good education being provided for them can the future of the country be hoped for. Each country has been paying much attention to children's cultivation, however, with the rapid speed of social development, Internet becomes more and more popular, so children have been gradually addicted to mobile phones and games, and the appear of fast food and lack of exercise lead to their unbalanced nutrition and overweight, resulting in slow social development.

Contact Martial Arts is a kind of contact sports with strength applied, whose main purpose is to defeat the opponent in the competition. There are many kinds of Contact Martial Arts, such as, Taekwondo, Karate, Martial Arts, Sanda and Judo, among which, Taekwondo started to be included in the event list of the Olympic Games in 1988 and Karate be added in the event list of the 2020 Olympic Games. Taekwondo is the first Contact Martial Arts being included in the Olympic Games' event list, with the highest popularity worldwide. With parents' attention to their children's education and physical ability, Contact Martial Arts has become one of their options for exercise. Therefore, the influence of Contact Martial Arts on children's physical fitness and physical quality has become a topic of much attention. In this paper, based on children's current status of physical fitness and physical quality, and physical characteristics of Contact Martial Arts, the influence of Contact Martial Arts on children's body figure and physical quality was discussed, with the results of the relevant studies being summarized, which can provide a reference for the implementation of Contact Martial Arts.

Germany has been paying much attention to children's physical fitness as early as 1912, who believes a healthy body only comes from good physical fitness, and that can make a person have a good working ability. In mid-December 1961, the Minister of the Federal Ministry of Internal Affairs said in Sports Association Meeting, "Only by staying healthy and strengthening physical exercise can we work better", which makes Germany become the first country to pay attention to children's physical fitness [4]. In 1954, Kraus et al. conducted a test by comparing the physical fitness of adolescents and children in the United States with that in Europe and other places, and the results showed that 56% of American students failed at least one testing item while only 8% of students in Europe did not pass the test, and due

to which, the United States immediately established the President's Council on Physical Fitness and Sports (PCPFS). PCPFS, with the assistance of the Federal Health Department, conducts a national physical fitness survey for adolescents and children every ten years, so as to find out problems in time and take measures [5]. With the rapid development of science and technology, and economy after the World War II, Japan, as an economically developed Asian country, owns high popularity of mass sports.

Although people worldwide are trying their best to pay attention to the health of children, and many relevant evaluation systems have been established, children's physical fitness problems have never been solved. According to the survey, the physical health level of Chinese adolescents shows a downward trend, mainly manifested as follows: continuous decline in endurance quality; periodical decrease in speed, strength and explosive power quality; increasing overweight and obesity detection rate, and doubling of the rate of bad eyesight. National Center for Health Statistics of Centers for Disease Control and Prevention (CDC) has conducted a National Health and Nutrition Examination Survey (NHANES) every two years since 1999 in order to monitor obesity and BMI changes in children and adolescents. It can be shown in Figure 1 that children and adolescent obesity rate in the United States has been on the upward trend [11]. And the increase of body fat content in children seriously affects the development of children's physical quality.

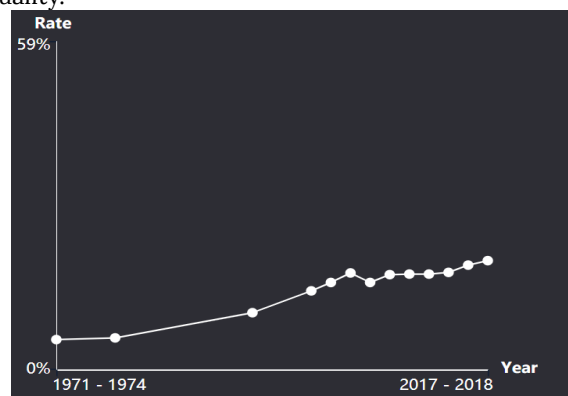


Fig 1. Obesity Trend of Children and Adolescents, 1971-2018

In 2013, the World Health Organization (WHO) pointed out that insufficient physical exercise became the world's fourth largest risk factor for death, calling for people to strengthen physical exercise and proposing

the slogan - "Physical Exercise Makes Life More Valuable". Exercise is an important way to improve the physical health level [10]. And lack of exercise is the main cause of poor physical fitness and diseases. The relation between physical activity & screening time, and weight status & cardiopulmonary health in children and adolescents were respectively researched in the 2012 National Health and Nutrition Examination Survey (NHANES), and the results showed that physical exercise was closely related to adolescent weight and cardiopulmonary function [6]. Contact Martial Arts is a kind of anaerobic and aerobic energy supply sports with high energy consumption and high demand of energy sources, which inevitably can increase body metabolism, strengthen energy digestion and absorption process, and promote the systemic blood circulation, ensuring body's demand for oxygen and nutrients, timely discharge of carbon dioxide, and the reduction of the accumulation of toxic substances within the body, so as to promote the function of the central system and the secretion of growth hormone, laying a foundation for the growth and development of children. Data show that children's respiratory rate during strenuous exercise is twenty-four times higher than that in the normal state, while the cardiac output is only six times greater than that in the normal state, which indicates that heart reserve ability is particularly important for children's practicing of Contact Martial Arts. Weak heart reserve ability can hurt children's body because their bodies can not bear the impact of exercise. Whereas both Contact Martial Arts training and competition will not increase the demand for oxygen in children's bodies. Cardiopulmonary system will increase the oxygen intake to maintain the body's oxygen supply, and that cycle repeats, which can effectively exercise children's circulation system, so as to provide effective help for the children's physical development. Studies have been shown that Taekwondo training can help children to improve their aerobic potential energy that reflects the ability of the cardiopulmonary system and respiratory system to complete strenuous activities [9]. The higher the aerobic potential energy, the better the cardiovascular energy supply [7]. After a 20-week Taekwondo training intervention for children, Yang Shu-ye found a significant increase in their respiratory system and cardiovascular function. The Research performed by the European Youth Heart Study shows that the aerobic potential energy shows a negative correlation with the Body Mass Index (BMI) [8]. Practicing Martial Arts also has a positive role in the correction of children's musculoskeletal system [2]. Extensive experimental results show that body fat rate decreases significantly and weight gained after practicing Contact Martial Arts, which fully demonstrate that Contact Martial Arts can improve children's physical mechanism and body figure.

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Physical quality also reflects physical fitness. There are five basic physical abilities that are known to be distinguished from - strength, agility, speed, endurance and flexibility. In Contact Martial Arts, if one wants to beat the opponent, one needs to coordinate efforts throughout the game and responds quickly, which has very high requirements for physical quality. According to the rules of Contact Martial Arts, athletes are destined to have super physical quality to support their movements. Coaches often integrate techniques like the transition between attack and defense into daily training to improve the practicers' response speed, and the flexibility and sensitivity of their bodies. Kicking, attacking, defending and other movements in training are conducive to children's muscle growth. Besides, Contact Martial Arts usually has rounds, which requires a strong muscle endurance quality to fight against the opponent for a long period of time. Taekwondo training can expand the cross section of the white muscle fiber, which can strengthen the endurance of the muscle.

According to the information reviewed, many researchers believe that Contact Martial Arts has a positive impact on the development of children's physical quality, and the Contact Martial Arts, such as Karate, Taekwondo and Martial Arts, was added to physical education course for primary school students, so as to determine the impact of Contact Martial Arts on children's health. The results show that the improvement of students' physical quality is related to the particularity of Karate as a means of sports culture. Karate classes require children to show a variety of exercise abilities and skills, which can help them to improve their ability to perform movements with different duration and amplitude by helping to combine the time and space, so as to affect movement coordination, response speed and other physical qualities. Karate elements have an effective impact on the development of students' coordination ability (L. I. Lubyshva, 2006). Baev I.V. pointed out that the sports coordination ability of children practicing Martial Arts has been rapidly developed, and there is no significant difference between boys and girls. [1] Luo Ying conducted a test by comparing the cardiovascular function, sensory-motor response and coordination ability of the children participating in Taekwondo training with those of the children who did not participate in. The results show that Taekwondo can improve physical health and promote the development of coordination ability. [3]

Therefore, childhood is the best stage for human growth and physical quality development. Contact Martial Arts training not only improves children's body figure and physical mechanism, but also promotes the development of children's physical quality in all aspects, especially strength, endurance and coordination ability.

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