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The Effects of Table Tennis, Basketball, and Athletics on the Prevention and Control of Myopia in Elementary School Students

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Abstract

Background and Aim: The visual acuity of children and adolescents is declining, which seriously affects the physical health of children and adolescents with the continuous integration and development of sports and health fields, many studies have shown that sports are closely related to the eye health of children and adolescents. Therefore, this study conducts table tennis, basketball, and athletics research on the prevention and control of myopia in elementary school students, and compares the effects.

Materials and Methods: This study conducted a 24-week exercise experiment intervention on children with low vision, selected 80 experimental samples that meet the requirements of the experimental research, and divided the 80 students into 4 groups on average using random grouping, set up 1 control group and 3 experimental groups. One-way repeated measures analysis of variance was performed on the data of the three experimental groups and control groups.

Results: The facility of accommodation and relative accommodation ability of the three experimental groups were significantly improved, while those of the control group were significantly decreased, indicating that the experimental intervention of table tennis, basketball, and athletics can improve the facility of accommodation and relative accommodation functions of the eyes. From the results of the change of the equivalent spherical mirror degree, it can be shown that the table tennis group has the best control effect, followed by basketball, and the third is athletics.

Conclusions: (1) Professionally designed table tennis, basketball, and athletics have a preventive effect on myopia diopter, and can control and slow down the progression of myopia to a certain extent. (2) Designing exercise programs related to the principles of eye movement is more effective in preventing and controlling elementary school students' myopia than traditional physical education courses. And (3) The intervention methods of table tennis, basketball, and athletics in this study to prevent myopia can be promoted and used in physical education classes in elementary and secondary schools.

Keywords: Table Tennis; Basketball; Athletics; Elementary School Students; Myopia

Introduction

Since the 21st century, human eye health issues have been receiving much attention, especially the eye and vision health problems of teenagers, which is a public health problem that urgently needs to be broken through in the medical field. With the continuous development and integration of medicine and sports in the world and China, the research on the eye health of adolescents has developed into a hot scientific research trend in the fields of medical health and sports. Under the development trend of China in recent years, the policies and research topics of the state and relevant departments are increasingly inclined to interdisciplinary research in the field of sports and health. Previously, in 2017, the World Health Organization (WHO) also listed children's myopia as one of the eye diseases to be significantly improved in the "Visual 2020" action (2017).

The serious decline in the vision of children and adolescents has become a major public health problem affecting the health of the younger generations of the entire Chinese nation. It is also commonly known as the "national disease" in China. Chinese President Xi Jinping attaches great importance to the healthy growth of children and adolescents and has repeatedly proposed at major national and international conferences that we must pay attention to and improve the physical health of adolescents. In the 2018 National Work Conference, it was pointed out that the prevention and control of myopia in children and adolescents is a key task related to the future of the country and the nation. Regarding the implementation of the prevention and control of myopia in children and adolescents, relevant departments must take action to find solutions. According to the data on the comprehensive development of the national people's physical fitness, the number of children and adolescents with

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myopia has shown a rapid increase and an upward trend year by year (2022). To implement and implement General Secretary Xi Jinping's important instructions on the work of children and adolescents' physical health, the prevention and control of myopia in children and adolescents has been upgraded to a national strategy, and it is urgent for relevant national departments, experts, and the whole society to participate in solving children and adolescents' health problems.

Objective

To compare the effects and results of using table tennis, basketball, and athletics on the prevention and control of myopia in elementary school students.

Literature Review

1. A review of research on the impact of sports on the eyesight of children and adolescents

Several previous studies have shown that physical activity can improve the physical fitness of participants. The eye is one of the most important organs of the human body. It is closely related to other organs and tissues of the body and affects and restricts each other. Studies have shown that sports can help reduce eye fatigue, which is greatly related to the eye-use behavior of sports participants during sports. When participants carry out sports, the individual's mental state is required to be highly concentrated, and the eyes need to keep an eye on various changes on the sports field, which will prompt the eyeballs to continuously adjust to adapt to the changes. In some sports, especially ball games such as table tennis, badminton, tennis, football, basketball, volleyball, etc. the eyes of the participants are required to follow the actual situation of the trajectory of the ball, such as the distance, the back-and-forth route of the ball, the rotation or the fall. The changes of the points of the eye are constantly adjusted, so that the contraction and relaxation of the external rectus and ciliary muscles are constantly alternated, which greatly improves the contraction and relaxation of the muscles of the external rectus and ciliary muscles, thereby improving the eyesight. The adjustment function of the eyeball can improve the ability of near vision and distance vision, and it is a very effective way to protect the health of eyesight.

When doing physical exercise, can effectively exercise and develop the cardiopulmonary function of children and adolescents, and then promote the blood circulation of all muscles and organs of the whole body. With the movement of the whole body, the blood circulation and supply of the eyeball tissue are in a strong state, which promotes the absorption of eye nutrients, accelerates the supply of nutrients to the optic nerve, eye muscles, and eyeballs, improves the nutritional status of the eyes, and accelerates the relief of eye fatigue, effective prevention, and control of myopia.

At present, relevant scholars have also incorporated sports into the prevention and control of myopia in children and adolescents, such as Song, S.X., Feng, Y.W., & Li, Y.H. (2002) research shows that table tennis can effectively exercise the ciliary muscles of the eyes, and improve the adjustment ability of the ciliary muscles, to prevent and improve vision. Jiang, H.H., & Wu, Y.H. (2010) proposed that at least 1 hour of wide-area sports (such as basketball, football, etc.) a day is a measure to prevent the high incidence of myopia in physical education teaching. During the exercise, the participants have a wide range of activities and a relatively wide field of vision and have sufficient time to observe the trajectory of the ball and the movement of the players on the field, to effectively regulate the eye muscles and promote eye blood circulation. Through the up and down, left and right movement of the eyeball, and the distance adjustment, the three pairs of muscles that control eyeball movement can be better strengthened, and the normal contraction and relaxation of the ciliary muscle can be promoted, to develop students' stereoscopic vision. Zhao, Q.F. (2011) used table tennis to intervene with elementary and middle school students for one year. The experimental results showed that table tennis can effectively improve the degree of myopia of myopic students and prevent the vision loss of emmetropic students. The study shows that sports can certain extent, it can prevent the occurrence of myopia in young people and reduce the degree of myopia in young people. Xiao, B.J. (2012) conducted a comparative study on the effects of two sports, table tennis, and middle-distance running, on the pseudo myopia of elementary school students. The results showed that both sports can help improve eyesight, and the vision improvement of the table tennis group was significantly better than that of a middle-distance running group, and the vision of the students in the table tennis group had a very significant

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difference before and after. Zhuang Q (2016) conducted a study on the incidence of myopia and physical exercise among 295 high school students and found that the proportion of myopia among students who participated in sports such as table tennis, basketball, badminton, football, running, and mountain climbing was significantly lower than that of students in other sports. It is also proposed that regular exercise of the above can promote eye blood circulation, enhance nutrient supply, improve visual function, and ultimately prevent myopia and improve vision. Jin, H.H., & Wu, Y.H. (2017) proposed that tapping the ball with different movement patterns as sports vision training can improve physical health, strengthen eye muscle function, relieve ciliary muscle fatigue, and prevent college students from myopia. Wu, X.N. (2018) research shows that table tennis and other sports can effectively slow down the occurrence of poor eyesight in children aged 6-9, and children who play table tennis more times a week have better eyesight than those who play table tennis. For children who do not exercise frequently, it is recommended that children and adolescents take part in more physical exercise to improve vision and overall physical health. Wang, Y., & Zhao, R.L. (2019) research shows that moderate-intensity aerobic exercise such as running has a significant effect on reducing intraocular pressure in the normal vision and moderate myopia group, and higher-intensity aerobic exercise has a significant effect on reducing intraocular pressure in the high myopia group. King, K., et al (2019) compared football, table tennis, and badminton with five-month sports experiment interventions to study the changes in dynamic visual acuity of elementary school students. The results showed that the three sports interventions had a significant effect on improving visual acuity. Pan, J.L. (2020) research results show that the physical activity intervention that strengthens the dynamic vision embedding has a good effect on the dynamic vision and static vision of children and adolescents; the experimental intervention of flower ball exercises, football, and athletics special basic exercises has a rehabilitation effect on the vision of myopic children and adolescents. It is believed that the combination of open motor skills and closed motor skills combined with strengthening dynamic vision sports activities can be used as an intervention treatment for the vision rehabilitation of myopic children and adolescents. Zhou, C. (2020) conducted a 16-week experimental intervention on 74 students in the fourth grade of elementary school. Among them, 37 myopic subjects performed basic athletics exercises. The results showed that the dynamic vision and static vision of myopic students were improved. Huang, Y.L. (2021) research shows that table tennis on 30 elementary school students with low vision. The study showed that table tennis can improve the adjustment function of the eyes of patients with low vision, as well as improve uncorrected vision, effectively controlling the rate of development of eye vision deterioration. Diao, Y.T. (2022) experimented with table tennis and badminton for 36 mildly myopic pupils. Studies have shown that table tennis exercise intervention can reduce the refraction of myopia, badminton exercise intervention can improve eye adjustment function, and intervention with table tennis and badminton exercise programs can improve the adjustment function of myopia in children and adolescents and control the progress of myopia to a certain extent. It is worthy of promotion and application in sports in elementary and secondary schools. Fu, T.T. (2022) conducted a one-year longitudinal follow-up and physical exercise intervention study on 551 third-grade students, showing that comprehensive physical exercise intervention has reduced the rate of unhealthy myopia, the detection rate of myopia and the rate of new myopia to a certain extent, indicating that comprehensive sports intervention can delay the development of poor vision and myopia.

The research on sports and vision conducted by the above scholars provides a new research direction for the current prevention and control of myopia and promotes the development of sports and health integration to a certain extent. Fan, Z., et al (2019) mentioned in their review and analysis of the Ministry of Education's implementation of the "Implementation Plan for Comprehensive Prevention and Control of Myopia in Children and Adolescents" that the National Education Conference deployed sports to promote the prevention and control of myopia, and actively promoted schools and localities to strictly implement children and adolescents' daily myopia prevention and control. 1 hour of intramural sports. Sports are closely related to visual acuity, and it is also a necessary means to use sports to promote the development of visual acuity. Therefore, this study not only strictly follows the process of expert evaluation, screening, and pre-experimentation in the formulation of exercise programs, but also conducts scientific computerized optometry examinations through regular ophthalmology centers and qualified optometrists in the examination of eye vision indicators, which can be more accurate. It

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reflects the changes in various physiological indicators of the subject's eyes and the real vision diopter results, which are more scientific and accurate.

2. Summary of studies reflecting eye vision indicators

The eye vision index is an important indicator to measure the physical health level of children and adolescents, and it is also an important parameter to measure the overall eye vision health level of the nation. Many scholars have carried out in-depth research on the parameters related to myopia. For example, Ma, K. (2004) research shows that the diopter of myopia is negatively correlated with the adjustment range and positive relative accommodation, and the incidence of hypo accommodation in myopia is significantly higher than that in emmetropia. Zhao, D. (2012) conducted a correlation study on the axial length, anterior chamber depth, lens thickness, corneal curvature, intraocular pressure, and other related refractive factors of children with refractive errors aged 5-13 and showed that they are all closely related. Du, P.R., et al (2016) conducted a comparative study on 107 emmetropic and myopic children aged 7-12, and proved that the diopter of myopia was negatively correlated with the axial length of the eye, corneal flexion tension, and anterior chamber depth; the diopter was positively correlated with uncorrected visual acuity relevant. Du, J., & Hu, L. (2017) studied the relationship between 96 cases of juvenile myopia and eye adjustment function and found that in the process of juvenile myopia, the adjustment range decreased, the positive and negative relative adjustment was insufficient, the accommodative sensitivity was poor, and the accommodative reflection was abnormal. It is closely related to the adjustment parameters of the eyes. Wang, C.H., He, H., & Xiong, K.Y. (2019) conducted a correlation study on the axial length, corneal curvature radius, axial length, and corneal refractive power of children aged 7-12 with different myopia, and showed that the axial length is positively correlated with the degree of myopia. The ratio of the radius of curvature can be used to define the index of myopia, and can also be used to classify different degrees of myopia.

Based on the above research results, many eye vision indicators can assess vision changes, and this study selected the diopter of spherical lens (DS), diopter of cylindrical leans (DC), spherical equivalent (SE), axial length (AL), uncorrected visual acuity (SC), corrected visual acuity (CC), positive relative accommodation (PRA), negative relative accommodation (NRA) and facility of accommodation (AF) to evaluate the effect.

Conceptual Framework

The experimental groups: three sports programs table tennis, basketball, and athletics were designed to intervene in the experimental group respectively. The control group: the school's routine “430” physical education classroom teaching activities. Intervention frequency and cycle: 90 minutes/class, 3 classes/week, and the intervention duration is 24 weeks.

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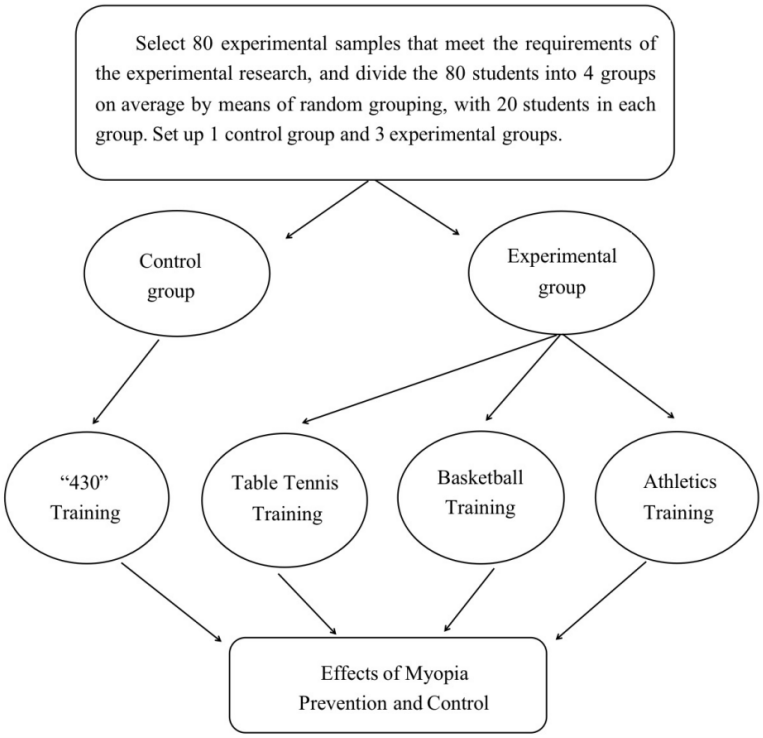

Figure 1 Conceptual framework

Methodology

Population and Sample size: Select 80 students from elementary school whose visual acuity index was lower than 1.0 in the school physical test as the experimental objects, and including 40 boys and 40 girls, aged between 10-12 years old.

Sampling: Divide 80 subjects randomly into 4 groups, set up 1 control group and 3 experiments, each group has 10 boys and 10 girls. Grouping process: 40 table tennis balls are placed in a closed box, and there are 4 colors in total. White represents the control group, red represents the table tennis group, blue represents the basketball group, and yellow represents the athletics group. First arrange 40 girls to draw lots, and then arrange 40 boys to draw lots in the same way.

Data Collection: Eye index test cycle: the first test was carried out before the experiment, and the second test was carried out in the 24th week. Collect various indicator data before and after the experiment.

Area Study: This research focuses on table tennis, basketball, athletics, and sports training for elementary school students' myopia.

Research Tool and quality of research tool: Equipment used: (1) Nidec comprehensive optometry instrument from Japan. (2) German Zeiss IOL-master intraocular lens biometer.

Data analysis and statistical treatment: Statistical data were collected using the Excel Program. One-way repeated measures analysis of variance was performed on the data of the three experimental groups and control groups.

Results

Before the experiment, there was no significant difference between the groups, see Table 1. After the experiment, the adjustment sensitivity and relative adjustment ability of the three experimental groups increased significantly, while the control group decreased significantly, with significant differences, see Table 2.

Table 1 Statistics of various eye index parameters of subjects in the control group and the experimental

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group before the experiment (N=80)

Indicator Name		Control Group (n=20)	Table Tennis Group (n=20)	Basketball Group (n=20)	Athletics Group (n=20)	F	P
DS (D)	OD	-1.238±0.681	-1.213±0.718	-1.188±0.555	-1.188±0.638	0.027	0.994
	OS	-1.175±0.591	-1.113±0.666	-1.075±0.452	-1.150±0.564	0.116	0.950
DC (D)	OD	-0.163±0.203	-0.238±0.286	-0.250±0.243	-0.250±0.292	0.528	0.664
	OS	-0.188±0.228	-0.150±0.188	-0.250±0.229	-0.225±0.280	0.702	0.554
SE (D)	OD	-1.319±0.732	-1.331±0.745	-1.313±0.599	-1.313±0.599	0.003	1.000
	OS	-1.269±0.564	-1.188±0.686	-1.200±0.497	-1.263±0.550	0.105	0.957
AL (mm)	OD	24.324±0.335	24.357±0.315	24.343±0.241	24.347±0.266	0.045	0.987
	OS	24.301±0.315	24.288±0.264	24.305±0.210	24.332±0.226	0.105	0.957
SC	OD	0.550±0.221	0.560±0.221	0.540±0.170	0.540±0.179	0.046	0.987
	OS	0.545±0.185	0.580±0.226	0.575±0.155	0.560±0.170	0.145	0.933
CC	OD	0.995±0.022	0.985±0.037	0.995±0.022	0.990±0.031	0.557	0.645
	OS	1.000±0.000	0.985±0.049	1.000±0.000	1.000±0.000	1.879	0.140
PRA	OU	-2.150±0.274	-2.075±0.305	-2.113±0.286	-2.150±0.308	0.299	0.826
NRA	OU	2.113±0.222	2.038±0.233	2.138±0.263	2.013±0.286	1.113	0.349
AF (CPM)	OD	10.750±1.682	10.300±2.055	10.050±1.538	10.200±1.795	0.575	0.633
	OS	10.950±1.099	10.250±2.049	10.400±1.569	10.300±1.922	0.721	0.543
	OU	9.600±1.759	9.300±2.386	9.200±1.963	9.150±2.059	0.193	0.901

*Note: * represents p<0.05; ** represents P<0.01*

Table 2 Statistics of various eye index parameters of subjects in the control group and the experimental group after the experiment (N=80)

Indicator Name		Control Group (n=20)	Table Tennis Group (n=20)	Basketball Group (n=20)	Athletics Group (n=20)	F	P
DS (D)	OD	-1.475±0.739	-1.300±0.746	-1.363±0.571	-1.413±0.740	0.224	0.880
	OS	-1.350±0.615	-1.163±0.840	-1.300±0.456	-1.325±0.664	0.324	0.808
DC(D)	OD	-0.238±0.206	-0.200±0.208	-0.263±0.250	-0.188±0.242	0.458	0.712
	OS	-0.313±0.333	-0.125±0.190	-0.200±0.238	-0.188±0.343	1.517	0.217
SE(D)	OD	-1.594±0.778	-1.400±0.787	-1.494±0.559	-1.506±0.737	0.236	0.871
	OS	-1.506±0.580	-1.225±0.879	-1.400±0.477	-1.419±0.617	0.647	0.587
AL (mm)	OD	24.456±0.362	24.407±0.341	24.439±0.262	24.435±0.285	0.083	0.969
	OS	24.400±0.299	24.352±0.284	24.395±0.205	24.413±0.251	0.205	0.893
SC	OD	0.465±0.235	0.550±0.263	0.510±0.217	0.490±0.220	0.470	0.704
	OS	0.475±0.215	0.575±0.238	0.540±0.179	0.535±0.203	0.782	0.508
CC	OD	0.995±0.222	1.000±0.000	1.000±0.000	0.995±0.022	0.667	0.575
	OS	1.000±0.000	1.000±0.000	1.000±0.000	1.000±0.000	——	——
PRA	OU	-2.113±0.236	-2.525±0.353	-2.438±0.267	-2.425±0.305	7.573	0.000**
NRA	OU	2.075±0.143	2.363±0.222	2.313±0.213	2.238±0.222	7.620	0.000**
AF (CPM)	OD	10.400±1.501	12.350±2.033	12.550±1.731	12.750±1.650	7.812	0.000**
	OS	10.450±1.605	12.350±1.814	12.050±1.761	12.300±1.750	5.400	0.002**
	OU	9.350±1.755	10.600±1.984	10.550±1.538	10.350±1.725	2.215	0.093

*Note: * represents p<0.05; ** represents P<0.01*

Discussion

Spherical power, cylindrical power, equivalent spherical power, and eye axial length, the changes in these eye vision indicators are closely related to the diopter of the eye, influencing and restricting each other. Zhao, D. (2012) study also showed that with the increase of age and height, the axial length

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of the eye also increases. Li, X., & Wang, X. (2010) think the axial length is positively correlated with myopia diopter, consistent with the results of this study. A spherical diopter can distinguish between myopic refraction and hyperopic refraction, and a cylinder diopter can reflect the state of astigmatism of the eye. Therefore, it is generally accepted that it is more accurate to reflect the diopter of the eyeball through the equivalent spherical diopter.

In this study, it was found that the 24-week exercise experiment intervention can not only accelerate the development of various tissues and organs in the body, but also promote eye movement, improve the adjustment function of the eyes, and thus resist the development of myopia. Accommodative ability in the control group decreased with increasing myopia. The positive relative adjustment, negative relative adjustment, and adjustment sensitivity of the experimental group have shown good changes, and there are very significant differences after the experiment. The overall effect is as follows: table tennis has the most obvious change, followed by basketball, and the third is athletics. The positive relative adjustment reference range of the emmetropic eye of ordinary people is between -1.75 and -3.00. The positive relative adjustment value represents the reserve capacity of the eye, which can be used more, and the larger the better. The adjustment sensitivity of the single eye adjustment power is lower than 11cpm is abnormal, and the adjustment power of both eyes is lower than 8cpm is abnormal. Therefore, after the experimental intervention, both of them have improved, which is helpful to the healthy function of the eyes. These research results are consistent with the research conclusions of Huang, Y.L. (2021) and Diao, Y.T. (2022), see Table 2.

Through the above analysis of the experimental results, it is shown that although the intervention of the three sets of exercise programs on the myopia diopter did not achieve a very significant effect, it also played a certain role in controlling and slowing down, and the effect is better than the traditional “430” physical education course.

Conclusions

1. Professionally designed table tennis, basketball, and athletics have a preventive effect on myopia diopter and can control and slow down the progression of myopia to a certain extent.

2. Designing exercise programs related to the principles of eye movement is more effective in preventing and controlling elementary school students’ myopia than traditional physical education courses.

3. The intervention methods of table tennis, basketball, and athletics in this study to prevent myopia can be promoted and used in physical education classes in elementary and secondary schools.

Recommendation

1. Since children and adolescents are in the changing stage of growth and development, and grow in different living environments, and also need to complete heavy learning tasks, the factors that affect children's eye health are diverse and changeable. In-depth research on sports to prevent and control children's visual acuity decline, is necessary to eliminate all kinds of interfering factors or minimize the influencing factors.

2. It is recommended that society, schools, families, and individuals should attach great importance to eye health issues, and vigorously publicize and promote the methods of preventing and controlling myopia in children and adolescents through written, e-books, or self-media in schools and all walks of life, and guide children and adolescents adhere to scientific sports, form exercise inertia, and improve the eye health level of children and adolescents.

References

Diao, Y.T. (2022). *Experimental research on the intervention effect of table tennis and badminton on children's myopia*. Master's thesis, Guangzhou Institute of Physical Education.

Du, J., & Hu, L. (2017). The relationship between myopia and adjustment parameters in adolescents. *Journal of Taishan Medical University.* 5, 544-546.

Du, P.R., Wu, X.X., Lei, H., & Meng, X.S. (2016). Research progress of the influence of biological parameters of ophthalmology on myopia. *Journal of Guangxi University of Traditional Chinese*

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Medicine. 2,104-107.

Fan, Z, Liu, L.J., Zhang, W., & Chen, T. (2019). Review on the progress of the implementation Plan of Comprehensive Prevention and Control of Myopia in Children and Adolescents by the Ministry of Education. *Chinese School Health.* 10, 1449-1452. doi:10.16835/j.cnki.1000-9817.2019.10.003.

Fu, T.T. (2022). *Tracking research on the myopia status of third-grade elementary school students and a preliminary study on the comprehensive prevention and control effect of physical exercise*. Master's degree thesis, Institute of Sports Science, State Sports General Administration.

Huang, Y.L. (2021). *Experimental research on the impact of table tennis push left and right attack on children's eyesight*. Master's thesis, Guangzhou Institute of Physical Education.

Jiang, H.H., & Wu, Y.H. (2010). Discussion on wide-area exercise and its preventive effect on myopia in elementary and secondary schools. *Journal of Xianyang Normal University*, 6, 100-102.

Jin, H.H., & Wu, Y.H. (2017). Exploration of the prevention and treatment of college students' myopia by clicking ball sports. *Sports Science and Technology Literature Bulletin,* 12, 24-26. doi:10.19379/j.cnki.issn.1005-0256. 2017.12.011.

King, K., Chen, J., Chen, G., Tan, Q., Zhou, S., Pan, J., & Cai, G. (2019). The effect of three ball games on improving the dynamic visual acuity of elementary school students. *Chinese Rehabilitation Theory and Practice.* 11, 1279- 1282.

Li, X., & Wang, X. (2010). Principles and methods of treatment of myopia in adolescents. *Science and Education Wenhui (late ten-day issue),* 12, 131-133.

Ma, K. (2004). *Regulating the relationship between various factors and myopia research.* Master's degree thesis, Sichuan University.

Pan, J.L. (2020). *Research on visual health promotion of children and adolescents based on intensive dynamic visual sports intervention.* Master's thesis, Soochow University.

Song, S.X., Feng, Y.W., & Li, Y.H. (2002). Table tennis comparative study of the impact of green children's vision. *The Chinese sports science and technology,* 11. The doi: 10.16470/j.carolcarroll SST 2002.11.006.

Wang, C.H., He, H., & Xiong, K.Y. (2019). Effects of different intensities of aerobic exercise on intraocular pressure of female college students with moderate to high myopia. *Chinese School Health,* 8, 1254-1257. doi: 10.16835/j.cnki. 1000-9817.2019.08.038.

Wang, Y., & Zhao, R.L. (2019). 7 ~ 12 years old children's Myopia degree with AL/CR value relations. *Journal of Chongqing Medical University*. 12, 1660-1664. The doi: 10.13406/j.carolcarrollnkicyxb.002329.

Wu, X.N. (2018). Table tennis exercise on 6-9-year-old children's vision and the suggestion. *The influence of sports science in Sichuan.* 4, 34-38. Doi: 10.13932/j.carolcarroll nkisctykx.2018.04.09.

Xiao, B.J. (2012). *Table tennis and middle-distance race for 7-8-year-old Schoolchildren Pseudomyopia improves experiment contrast to explore.* Master's degree thesis, Shandong Sports Institute.

Zhao, D. (2012). *Children ages 5 to 13 state of refractive errors and refractive elements in correlation studies.* Master's degree thesis, Chongqing Medical University.

Zhao, Q.F. (2011). *The movement influences teenagers' vision research.* Master's degree thesis, Jiangxi Normal University of Science and Technology.

Zhou, C. (2020). *Experimental research on the effect of basic athletics exercises with dynamic visual tasks on the vision of myopic patients in the fourth grade of elementary school.* Master's thesis, Soochow University.

Zhuang, Q. (2016). Study on the effect of physical exercise on myopia of high school students. *Sports.* 19, 47-48.

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