

Discussion on the "Combination of Colleges and Universities" Mode of Preventing and Controlling Myopia in Teenagers

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Abstract: With the advancement of science and technology and the evolution of lifestyles, the problem of myopia in adolescents has become more and more serious, and has become a global public health challenge. This article is devoted to exploring the myopia prevention and control mode of "family - school - medical - competent departments" four-end cooperation and joint prevention and control. Through close cooperation between schools, families and medical institutions, we aim to jointly build a comprehensive myopia prevention and control network. The model focuses on early intervention, health education, environmental improvement and regular check-ups, with the aim of effectively reducing the incidence of myopia among adolescents.

Keywords: Myopia; Adolescents; Myopia Management; Myopia Prevention and Control.

1. Introduction

Myopia is a type of refractive error in which light from distant objects (equivalent to being parallel to the optical axis) enters the eye when the eye is relaxed and focuses on the front of the retina. Myopia is usually caused by too long an axis of the eye, but it can also be caused by an overly curved cornea or a lens with increased refractive power, or both. This condition is particularly common in teenagers, not only can affect their learning and daily life, but also may lead to other eye diseases, such as amblyopia, strabismus and so on. Therefore, the prevention and control of myopia has become an important issue of great concern in the field of education and medical treatment.

2. The Implementation Background of the "University Combination" Model

In recent years, the problem of myopia among teenagers has become increasingly serious. According to a number of studies and survey data, including China, the United States, Europe and other countries and regions, the rate of myopia among adolescents is on the rise. Especially in East and Southeast Asia, the prevalence of myopia remains high, with about 80% to 90% of young people suffering from myopia [1] and the incidence of high myopia ranging from 10% to 20% [2]. The incidence of myopia is relatively low in developing countries, which is closely related to factors such as urbanization level, education level and socio-economic status [3]. According to relevant literature prediction [4], the global incidence of myopia in 2020 is about 33%, and by 2050, this proportion is expected to rise to 50%, affecting nearly 5 billion people worldwide. This trend will lead to a sharp rise in the risk of eye complications such as myopic macular degeneration, retinal detachment, glaucoma and cataracts, significantly increasing the number of people affected by high myopia-related eye diseases and vision loss. It brings a heavy

psychological and economic burden to individuals, society and families.

With the changes in the living and learning environment of children and adolescents, the long-term close eye use, the reduction of outdoor activities, poor eye use habits and genetic factors together affect the visual health of adolescents. According to the latest monitoring data of the National CDC, the overall myopia rate of Chinese children and adolescents in 2022 is 51.9%, among which 36.7% of primary school students, 71.4% of middle school students and 81.2% of high school students [5]. It can be seen that the incidence of myopia among adolescents gradually increases with the increase of school age. Therefore, as the main target of myopia prevention and control, the society should take active measures to prevent the occurrence of myopia [6][7]. The Chinese Medical Association recommends the establishment of a child vision screening database in order to assess the development trend of myopia and take effective measures for early intervention [8]. At present, Singapore and China (including Chinese Taipei) have launched national myopia prevention and control programs.

On August 30, 2018, the Ministry of Education, the National Health Commission and other eight departments jointly issued the Implementation Plan for Comprehensive Prevention and Control of Myopia in Children and Adolescents, which for the first time explicitly included the myopia rate of adolescents in the government performance assessment system. In order to actively respond to the national call for the prevention and control of myopia among young people and fulfill our social responsibilities, we rely on our professional advantages in the field of optometry and cooperate with Qilihe Primary School to jointly create an innovative monitoring model of myopia prevention and control knowledge education and training. We have established the Eye Health Science Hall of Qilihe Primary School to carry out regular eye health examination in the school and establish a complete personal eye health file. Through this initiative, we have initially built a four-body eye

health management network of "family - school - medical - authorities", committed to providing continuous eye health monitoring for Qilihe Primary School students.

3. Implementation Strategy of the "College Integration" Model

In January 2024, our hospital signed a cooperation agreement with Qilihe Primary School to set up the Eye Health Science Museum in the school. Through the form of exhibitions, the museum leads visitors to explore the mysteries of the eye, learn knowledge of eye health, experience the daily work of ophthalmologists, and listen to popular science lectures. We use attractive interactive Spaces and advanced multimedia technology to stimulate teachers, parents and children's curiosity about the infinite mysteries of the eye, popularize the knowledge of ophthalmology, and help children develop good eye habits.

In form, we have realized the transformation from the traditional "lecture-style" love eye lecture hall to the diversified "popular science" venue; In terms of content, we have improved the zoning Settings of the venues and highlighted the key points of science popularization in each pavilion. The Eye Health Science Museum is divided into three areas: science popularization area, eye love lecture area and interactive experience area. From preliminary exploration of the mysteries of the eye, to in-depth understanding of eye health knowledge, to listening to popular science lectures and experiencing the work of ophthalmologists, the construction of the science museum is rich and in-depth. In the way of display, we have adopted a graphic display board, eyeball model, etc., to vividly show the structure and development of the eye; In terms of technology, through multimedia interactive on-demand, we have more intuitively demonstrated the knowledge of eye disease prevention and health care to teenagers and teachers and parents; In terms of sensory simulation, we set up a simulated doctor's office and a dark room, equipped with myopia, farsightedness, astigmatism lenses, to help students understand different types of refractive errors and their treatment; At the same time, we are also equipped with visual examination equipment (such as poly ball, flip bat, letter card, visual relief chart, color blind card) to help students understand visual examination and treatment methods. The above methods are set up the corresponding game links, you can make physical visual experience such as solid models, but also through the computer design and print their favorite glasses samples. The eye care interactive and eye Knowledge Interactive response can be completed through multi-touch media.

Each semester, students are required to complete a comprehensive eye health screening on campus in order to create a detailed eye health profile for each student. With the help of these archives, schools and hospitals can effectively monitor and guide students with visual impairment, and formulate personalized prevention and intervention programs based on their visual status[9][10]to ensure that they can improve their vision problems in time. In order to create a more favorable campus environment for vision protection, the school set up eye exercises during recess, and made appropriate adjustments to the lighting facilities and desks and chairs in the classroom; A series of eye health education activities are also held regularly in the school to encourage students to actively participate in outdoor sports, aiming to raise students' awareness of the importance of eye health.

Schools will also strengthen eye health guidance to families to help parents better understand how to protect their children's vision at home. Through these comprehensive measures, the school expects to effectively prevent and reduce the occurrence of vision problems and provide solid support for the healthy growth of students.

4. Effect Evaluation

The "combination of schools and colleges" myopia prevention and control mode of Qilihe Primary School aims to create an environment conducive to vision protection for young people through close cooperation between schools and families. Through the combination of school education and family guidance, students and parents have a deeper understanding of the causes, hazards and preventive measures of myopia, thus enhancing their awareness of vision protection, and achieving remarkable results in improving students' and parents' awareness of the importance of myopia prevention and control. It is reflected in the following aspects: (1) The hospital regularly sends staff to the campus to popularize eye health knowledge and carry out vision examination, and establishes a detailed eye health file for students in order to monitor and record changes in students' vision problems; (2) The school and optometry experts of our hospital jointly develop myopia prevention and control plan, formulate reasonable curriculum arrangement, recess system and provide scientific eye guidance, incorporate vision protection into an important part of school education, pay attention to students with vision problems, and urge them to seek medical treatment; (3) The students deepened their understanding of the structure and function of the eyes through popular science activities, and actively expanded the relevant knowledge field in their own speeches; In daily study and life, they pay more attention to eye health, master the importance of regular eye rest and maintain correct reading posture. (4) Parents should actively intervene in children's vision protection work, strictly supervise children to reduce dependence on electronic products, control the frequency and duration of use; Take proactive action to seek professional medical help when your child is found to have low vision or other related problems during an eye health screening.

In short, the "combination of colleges and universities" model has a certain effect in the prevention and control of myopia in teenagers, but it needs to be further improved and optimized. In the future, communication and cooperation between families, schools and medical institutions should be strengthened to ensure that every student can grow up healthily in a good environment.

5. Discuss

From the perspective of education, the value of eye health management model lies in that it can not only enhance teenagers' cognition and attention to eye health through systematic education and training, but also guide parents to pay attention to teenagers' visual health. For example, the improvement of the visual environment, Qilihe Primary School under the guidance of Zhongshan Eye Center of Sun Yat-sen University, the campus lighting facilities have been improved, the lighting and lighting requirements of classrooms, libraries (reading rooms) have been implemented, and some parents of students have also evaluated and improved the lighting facilities at home. To carry out eye health education activities in school is helpful for young

people to develop good eye habits and prevent eye diseases such as myopia and amblyopia. The hospital provides customized guidance and advice, and the school provides supervision and monitoring to help students and parents cope more effectively with vision problems in study and life, thereby promoting their overall health and academic performance.

From a medical point of view, the value of eye health management model lies in its ability to provide comprehensive and scientific medical services and intervention strategies. The medical field attaches great importance to the prevention, diagnosis and treatment of diseases, while the eye health management model effectively controls and delays the course of eye diseases through regular eye examination, early screening and timely treatment. As a bridge connecting hospitals and families, schools shoulder the responsibility of assisting hospitals to carry out social science education, and can provide health knowledge popularization and explanation services that hospitals cannot carry out deeply in outpatient clinics. Factors affecting adolescent myopia generally include individuals, families, schools, communities, environment, policies, etc. [11]. This model establishes a long-term and stable diagnosis and treatment relationship between adolescents and doctors, promotes the continuous attention and monitoring of adolescents' overall health status, and enables patients to receive comprehensive health intervention instead of only receiving intervention in the past. In addition, through the integration and analysis of the data collected during the eye health monitoring process, we can calculate the visual acuity level and the prevalence of eye problems in local adolescents, and by perfecting the eye health records of family members, we can obtain a large number of etiological, epidemiological and diagnostic data. These huge data sets are expected to help us complete many myopia management tasks through artificial intelligence pattern analysis in the future [12-13].

From a sociological perspective, the value of the eye health management model is reflected in its ability to promote social equity and improve public health. By popularizing eye health knowledge, the model has narrowed the health gap caused by economic and geographical differences, enabling a wider range of people to access high-quality eye medical services. In addition, through the cooperation between the government, social organizations and medical institutions, the effective integration of social resources has been realized, and multi-level and diversified services have been provided to meet the needs of eye health care, thus improving the public health level of the whole society.

Although the "combination of colleges and universities" model has achieved remarkable results in the prevention and control of myopia among teenagers, it still faces many challenges and difficulties. First of all, some school leaders and parents have insufficient understanding of myopia prevention and control, and lack sufficient attention and investment. It is necessary to strengthen the publicity of scientific popularization and raise the public's awareness and attention to the prevention and control of myopia. Due to the differences in resources and conditions among different regions and schools, the effect of prevention and control is unbalanced. Therefore, it is necessary to establish a sound monitoring and evaluation mechanism [14] to reduce the impact of these factors on vision monitoring and evaluation, so as to detect and solve these problems in time. With the progress of science and technology, electronic products are

increasingly popular among teenagers, which brings new challenges to the prevention and control of myopia. In order to promote the sustainable development of the "combination of colleges and universities" model, it is suggested that the government increase investment and improve the special financial support for myopia prevention and control; Strengthen the training of school health education teachers to improve the quality of health education; Establish a national myopia prevention and control database and information system to realize data sharing, monitoring and evaluation; At the same time, enterprises and social organizations should be encouraged to participate in the prevention and control of myopia and build a diversified prevention and control system.

6. Conclusion

The model of "combination of colleges and universities" has important practical significance in the prevention and control of myopia in teenagers. Through the close cooperation of schools, families and medical institutions, this model can effectively improve the efficiency and effect of myopia prevention and control. In the future, the "university combination" model should be further improved to form a more scientific and systematic prevention and control strategy. This includes strengthening communication and coordination among all parties to ensure the timely transmission and feedback of information; Formulate more detailed and specific prevention and control measures to ensure that each measure can be implemented; Strengthen publicity and education, improve the health awareness of teenagers and parents, so that they can better participate in the prevention and control of myopia. This way of tripartite cooperation can form a comprehensive and multi-level prevention and control system, so as to better protect the visual health of adolescents. Through these efforts, we are expected to make greater breakthroughs in the prevention and control of myopia among adolescents, and provide better protection for the healthy growth of adolescents. This activity is led by the Gansu Provincial Science and Technology Association, the invited experts are industry leaders, before the discussion has full theme preparation, in-depth discussion around the theme, and traditional Chinese and Western medicine experts together to discuss, with good representation, the formation of a consensus can represent the consistency of traditional Chinese medicine and Western medicine, can truly reflect the current situation of the industry, there is a good role of guidance and suggestions.

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