Original Article

Comparison of the Educational Effect upon Myopia Prevention and Treatment between Video Demonstration and Traditional Teaching

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Abstract

Purpose: To compare the education effect of video demonstrations and conventional teaching on the prevention and control of myopia.

Methods: Eighty students were randomly divided into an experimental (n=40) and a control (n=40) group, and each group was split into two classes of 40 students. The students in the experimental group attended classes mainly based on video demonstration and those in the control group received conventional teaching. All students then undertook a test and the examination scores were statistically compared between the two groups.

Results: The educational background, age, and gender did not differ between the two groups (all P>0.05). The experimental group had a mean test score of 8.25±1.45, which was slightly lower than the mean of 8.58±1.11 in the control group, but the difference was not statistically significant (t=−1.589, P=0.114).

Conclusion: The educational effect of video demonstrations was almost identical to that of traditional teaching. In addition, video classes reduced the training time and financial costs, indicating that they deserve widespread application. (***Eye Science 2015; 30:67-69***)

Keywords: adolescent; science popularization; myopia; education

Introduction

According to World Health Organization statistics, the prevalence of myopia among elementary and middle school students in urban China has been gradually increasing, up to 78% of the third-grade middle school students. Myopic persons are estimated to account for approximately 33% of the global population. Myopia is regarded as the primary cause of health issues in elementary and middle school students in China[1-3]. Environmental factors, such as the time spent performing near work and outdoor activities, are intimately associated with the aggravation of myopia. Previous studies indicated that reasonable reading habits and participation in outdoor activities may effectively control the incidence and development of myopia[4-6]. However, the public may be unfamiliar with the relevant knowledge. At present, the health education curriculum is universally delivered in most elementary and middle schools. During these classes, the students have the opportunity to learn about the prevention and control of myopia. Our aim in the present study was to enhance education about the prevention and control of myopia by delivering classes in the form of video demonstrations. The students were then required to take a test. The mean scores following video demonstrations and conventional teaching were statistically analyzed to compare the effectiveness of each style of teaching.

Subjects and methods

Study subjects

A total of 160 fifth grade students from the same primary school were enrolled in this study and randomly divided into an experimental and a control group (n=80); each group was then split into two

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classes of 40 students.

Study methods

The students in the experimental group watched a video demonstration, and those in the control group were taught by a teacher experienced with PowerPoint (PPT) files. The knowledge and content were identical in both the video and PPT files. At 1 d after teaching, all students took an examination related to the prevention and control of myopia.

Test design

The test consisted of 10 multiple choice questions related to aspects of myopia, including its definition, the definitions of accommodation and pseudomyopia, the harm, risk, and protective factors of myopia, healthy reading and writing habits for adolescents, the reason why mydriasis is administered before a refraction test, accurate correction methods for myopia, preventive measures for myopia, and proper outdoor activities for myopia prevention. Four options were designed for each question. One point was given for each correct answer. No penalty was applied for a wrong answer or omitting a question.

Statistical analysis

SPSS 17.0 statistical software was utilized for data analysis (SPSS Inc., Chicago, IL). The test scores between the two groups were statistically compared by an independent sample *t*–test.

Results

Eighty students were assigned to each group and each group was then divided into two classes of 40 students. In the experimental group, the mean student age was 10.00±0.45 years and there were 41 males and 39 females. In the control group, the mean age was 10.00±0.48 years and there were 43 males and 37 females. Age and gender did not significantly differ between the two groups (both $P>0.05$). The mean score in the experimental group was 8.25±1.45, which was slightly lower than the score of 8.58±1.11 in the control group.

An independent sample *t*-test revealed no statistical significance in the mean scores between the two groups (t=-1.589, P=0.114), suggesting that video demonstration was not educationally inferior to the traditional teaching method.

Discussion

Recent World Health Organization statistics indicate that the prevalence of myopia in elementary and middle school students in China is second in worldwide ranking. The incidence of myopia is as high as 78% among third grade junior students[1-3]. A national test of physical health in elementary and middle school students conducted in 2012 showed that the prevalence of low visual acuity has been constantly increasing among elementary and middle school children. Myopia has therefore become one of the most challenging issues facing elementary and middle school students in China[7].

Attempts to resolve the high incidence of myopia in Chinese adolescents have been initiated by ophthalmologists through their contributions to the prevention and control of myopia[8,9]. However, a majority of parents have a poor understanding of the causes of myopia and consider it to be a normal phenomenon resulting from excessive reading and writing, which is unavoidable in schoolchildren. The pathogenesis of myopia remains elusive, but recent studies have indicated that the incidence of myopia can be prevented and the progression of myopia is controllable. Near work and unhealthy habits are recognized risk factors for the incidence and progression of myopia. Sufficient time partaking in outdoor activities is a protective factor in preventing myopia[4-6]. In addition, increasing the amount of time in outdoor activities can lower the incidence and development of myopia[9].

Some scholars have demonstrated that delivering health education can improve the compliance of adolescents towards the prevention and treatment of myopia and play a positive role in suppressing the progression of adolescent myopia. A series of meta-

Table 1 Comparison of test scores between two groups

	Number	Test score	Extremely poor	95% CI	*P*
Experimental group	80	8.25± 1.45	5~10	7.93~8.57	0.114 (t=–1.589)
Control group	80	8.58± 1.11	6~ 10	8.33~ 8.82	

analysis conducted in recent years to analyze the prevention and control of myopia determined that the methods for myopia prevention are not complex. The key is to educate the students and their parents with the latest knowledge related to myopia prevention and ensure that they fully implement the instructions.

At present, a health education curriculum has been established in most middle and elementary schools. However, old knowledge rather than novel findings are typically taught in these traditional classes. Thus, the class content limits the educational effect and significance for the students. Traditionally, a large-scale training program should be run for the teachers, who would then impart the knowledge to their students. This type of education is time-consuming and expensive, and the teachers often fail to deliver the latest information to their students as time progresses. In this study, the knowledge highlights of myopia, such as basic principles and prevention measures for myopia, were integrated into a video, which was prepared for subsequent teaching. The educational effect was statistically compared between a video demonstration and conventional class teaching, based on test scores. The educational efficiency of the video demonstration, based on the test scores, was almost identical to that of the traditional class.

Video demonstrations have multiple advantages over conventional classes. First, videos can convey the latest knowledge in a more professional pattern. Second, the science knowledge can be standardized by the video format. Third, videos require no teacher training, thereby providing substantial time and cost savings. Fourth, video demonstrations are more easily accepted and learned by parents. In addition, no questions were allowed from the students during the video demonstration, to minimize the differences between the two groups. In practice, the educational effect might be significantly enhanced if the students were allowed to ask questions and teachers could deliver instructions.

Taken together, the results indicate that video demonstration deserves a wide application in delivering health knowledge. However, it is merely one component of myopia prevention in adolescents. Collective efforts are needed from the students, parents, and teachers to achieve the goal of myopia reduction.

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