

Interventional Study on the Effectiveness of Eye Exercises Based on Composite Feedback Model in School-Age Children

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I. INTRODUCTION

Healthy children are the nation's greatest resource. Children are important to their parents, and a successful member of society should be safe. A child starts out as an infant, grows in size and height to become a teenager, then an adult. Kids are very important in determining how the world will be for several years. Kids grow up and become popular in most parents' dreams, but not all children are good in their lives.

The human eye is our most important sense organ. It lets us see, understand, and catch what's important to our lives in the world. This is the reflection of the spirit and body, as well as the portal to the outside world. The learning target begins in infancy, and a child's vision precision can significantly influence or change learning ability. Vision is important for the child's potential carrier as a life-supporting breathing act. (Pavithra, 2020).

The eye is the sight organ in the orbital cavity, surrounded by six muscles supplied by the optic nerve. The human eye is an organ that responds to light and has many functions as a sensory organ. The eye helps the retina have active perception of light, including colour distinction and depth perception. (Willson, 2016).

Sight is the perception of retinal representations. The interpretation of retinal images is known as vision. "What we see, we remember, and what we remember, we imagine seeing." The coordination of seeing, memory, and imagination is required for perfect eye sight. "The only thing worse than being blind is having sight but no vision." - Helen Keller (Dennison, 2014).

The Snellen map, a widely recognised method, will test visual acuity. The Snellen chart is tested at 6 meters, and the natural vision is denoted as 6/6 and improved to 6/60, which is extreme myopia. Natural vision is the ability to see clearly without glasses at all distances. It's usually called "20/20" vision. The expression "20/20" is a definition of vision based on how clearly images such as text, numbers, or pictures are displayed on a standardised eye chart that is tested at 20 feet. (Schmid and Brown, 2019).

Individuals with high myopia are likely to encounter floats, blurry forms that appear singly or in groups, in their field of vision. The root cause is unknown, but it is related to food, environment, schools, genes, behaviors, or lifestyle. (Ahmed and Mian, 2020).

Myopia may be caused by too much work, such as teaching, reading, and computing. Severe short-sightedness has a slightly higher chance of developing glaucoma, macular degeneration, and retinal detachment that can cause blindness. Children start wearing prescription glasses as early as normal in primary schools. They also upgrade their glasses to higher-powered pairs every few months as they cope with the school workload as well as the computer games and play stations' near-point vision stress. **(Vision Therapy Manual, 2020).**

The association between myopia and higher IQ and its hindrance to school achievement A common reason for myopia is nearwork. One of the reasons is that the myopic child is more articulate and learns more, which increases intelligence. The opposite theory is that the smart, studious kid reads more, triggering myopia. Another theory is that pleiotropic gene(s) affect brain and eye size simultaneously. According to the two latest reports, higher IQ could be correlated with myopia in school kids, irrespective of the number of books read per week. **(Hennessy and Badjou, 2019).**

II. NEED FOR THE STUDY

The world's estimated total child population is 7 billion. In India, 31% of the population—190,075,426 males and 172,799,553 females—are children (Census, 2019). According to the Prevent Blindness America Foundation, one in four school-age children has vision disorders that can impair cognitive capacity, personality, and school transition if left untreated.

A study reported a faster rate of progression of myopia among children who spent more time doing close-up work. The exterior of the eye has six muscles, which help the eyes move around. They should be able to easily pursue visual interest. The problem may be emotional or physical stress. Straining action essentially squeezes eyeballs. It makes vision blurred, changing the visual field on the retina. Natural treatments for improving vision include eye movements and calming techniques. Also, eyesight becomes worse during times of stress, exhaustion, sickness, etc. and better during periods of relaxation. Eyes become more relaxed in the morning after a good night's sleep or during vacations. The theory that eyesight cannot be improved naturally disagrees with the experiences of many people regarding their own eyesight. People with good eyesight are those who haven't developed poor vision patterns. The secret to normal sight is relaxation or vision patterns. **(Kokkinakis, 2019).**

Visual corrective aids, such as contact lenses, are methods of correcting defective distant vision from myopia. Certain other approaches include visual preparation, biofeedback preparation, bifocal spectacles, contact lenses, atropine eye drop instillation, beta-blocker eye drops, reducing intraocular pressure, and surgery. Optical myopia correction and appropriate methods to avoid myopia development were developed and recommended primarily by optometrists. At present, certain widely used recovery measures include orthokeratology, visual biofeedback preparation that includes Bates exercises, and conventional Chinese exercises. **(Saw and Gazzard, 2020).**

III. LITERATURE REVIEW

The review of the literature in this present study has been done from published journals, unpublished thesis and textbooks, an electronic database such as MEDLINE, Google scholar and Pub Med to provide readers with an understanding of the study and to justify the selection of the problem.

The review of literature for the present investigation has been done under the following parts:

Section A: Studies related to prevalence and incidences of myopia among children.

Section B: Studies related to Bates exercise.

Section C: Studies related to eye exercises and Visionin myopia.

Section D: Studies related to quality of life of children with myopia.

Section A: Studies related to prevalence and incidences of myopia among children.

Kalikivayi and Manish (2019) conducted a study to determine the prevalence of visual disability due to refractive errors and ocular diseases in Hyderabad, India, in lower middle-class children. A total of 4,029 students, including 2,348 males and 1,681 females, were screened from 9 schools in the 3-18-year age group with a comprehensive eye exam protocol. Among these 3,669 children whose vision was recorded, 115 (3.1%) had vision less than 6/18 in the better eye (equivalent to visual impairment), while 41 (1.1%) had vision less than 6/60 in the better eye (equivalent to legal blindness), 18 (0.5%) had vision less than 6/60 in the better eye (equivalent to economic blindness). For 115 children with initial vision below 6/18, vision improved to more than or equal to 6/18 with refraction in 109 (94.8%) and myopia prevalence was 8.6%.

Section B: Studies related to Bates exercise.

Suresh (2019) wrote an article about the Indian ophthalmologist, Dr. RS Agarwal, who was interested in the work of Dr. Bates and started a School for Perfect Eyesight at the Sri Aurobindo Ashram in Pondicherry (1930). In his article "My Visit to Pondicherry", he described the training in the "School for Perfect Eye Sight," part of Aurobindo Ashram. He explained that his eye sight had become clearer, and his optical power had changed from 1.5 Dioptres to 0.5 Dioptres, remaining the same over the years.

Gopinathan et al (2013) performed a clinical review of 66 cataract patients. The research was performed by random sampling method in two classes of 4 subgroups of myopia, hypermetropia, astigmatism and presbyopia. Group A underwent Bates eye exercise; Group B was subjected to trataka yogakriya. The methods used for assessment were retinoscopy, autorefractometer and keratometer. The result showed that in eye exercises group and trataka group had marked improvement and none of the patients were cured. In eye exercises, moderate improvement was observed in one patient, mild improvement was observed in 20 patients, and no improvement was observed in 10 patients, while trataka group shown moderate improvement in two patients, mild improvement in 18 patients, and no improvement was observed in 12 cataract patients.

Section C: Studies related to eye exercises and vision in myopia.

Mohamed (2013) conducted a study to investigate the effectiveness of specifically designed eye exercises program on myopia control for Saudi female adolescents. Fifteen female students were recruited from two schools in Riyadh city. They ranged in age from 12 to 15 years. A program of eye exercises was practiced by all subjects for six weeks. Vision was measured by the use of an auto refraction device before and after six weeks of training. The results revealed a significant improvement of vision in both right ($p=0.028$) and left eyes ($p=0.020$) indicating that eye exercises as vision therapy-based program could improve vision for female adolescents with myopia.

Section D: Studies related to quality of life of children with myopia.

Nathan Congdon, (2019) conducted a randomized controlled trial among 20,000 children in 250 schools in Western China reported that mathematics test scores at the end of a school year had improved significantly among the 1,153 children who had failed vision screening and were offered free spectacles; the difference was the equivalent of half a semester of additional learning. An important finding in this study.

IV. PURPOSE OF THE STUDY

The primary purpose of the study was to speak with parents and children who were diagnosed with refractive problems about their reluctance to wear corrective lenses because of the limitations it would have on their ability to participate in their typical play activities. This results in inappropriate use, which in turn further exacerbates the problem. The current educational institutions and leisure activities are different from what they were in the past, which is another factor that contributes to the decline in visual acuity. Therefore, the researcher decided to investigate this subject to see whether or not eye workouts may assist in enhancing the vision of school-aged youngsters.

V. OBJECTIVES OF THE STUDY

1. To assess the level of vision among children with Myopia in experimental and control group.
2. To administer bates exercise among experimental group.
3. To assess the post- test level of vision among children with Myopia in experimental and control group.
4. To associate the pre-test assessment level of Vision with the demographic variables in experimental and control group.
5. To assess the impact of myopia among school children

HYPOTHESES:**Alternative hypothesis**

H1- There is a significant difference between pre and post-test level of assessment level of Vision among children with Myopia among experimental group.

H2- There is a significant difference between post-test assessment level of Vision among children with Myopia between Experimental and control group.

H3-There is a significant association between pre-test assessment level of Vision among children with Myopia and selected demographical variables.

Null hypothesis

H01- There is no significant impact on life experiences of school children due to myopia.

OPERATIONAL DEFINITIONS**Mixed Method Design- convergent parallel design**

A convergent parallel design entails that the researcher concurrently conducts the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyses the two components independently, and interprets the results together. In this study Quantitative method is Pre experimental design and qualitative method is qualitative descriptive design.

Effectiveness

Effectiveness means having a definite or desired effect. In this study it refers to the change in Vision among children with myopia after Bates exercise.

Selected Therapeutic Eye Exercises

Refers to the series of eye exercises (Bates Exercise:) which includes sunning, palming, swinging, simple blinking and simple eye exercises.

Children with Myopia:

Refers to the children who are studying fourth to tenth standard, wearing spectacles and reported to have short sight, in selected schools in Kerala.

Experiences

This study assesses the experiences of children with myopia, outlining negative and positive features of life.

6.1 Research Design

This study adopted for the present study is Mixed Method Design- convergent parallel design. In this study Quantitative method is Pre experimental design and qualitative method is qualitative descriptive design.

6.2 Setting

Selected Hospitals in Indore.

6.3 Sampling

Sampling technique adopted for the study was the researcher will use random sampling for the qualitative component and purposive sampling for the quantitative component.

6.4 Sample size

The sample consisted of 168 children with myopia who are studying in selected schools at Indore and who fulfilled the criteria for inclusion in the study.

6.5 Sampling criteria

Inclusion Criteria

1. Children who were wearing spectacles and reported to have short sight.
2. Student who were willing to participate.
3. Children who had consent from parents to participate in eye exercises.
4. Children who are studying 4th to 10th class in selected schools at Indore.

Exclusion criteria

1. Student who have already undergone treatment for Myopia.
2. Students suffering with Conjunctivitis and other infectious disease.
3. Students already selected for pilot study.
4. Children under the treatment for any mental diseases.

6.5 The data collection tool

DESCRIPTION OF THE INSTRUMENT

The tool for quantitative data collection consists of three sections.

The following tools will be use for the study

1. Questionnaire on demographic profile and details regarding vision and its related problems.
2. Snellen chart

The first standardized eye chart designed to measure visual acuity was introduced by Herbert Snellen in 1862. Although Snellen eye chart was introduced well over a hundred years ago, it is still the most common way to measure and report visual acuity. Visual acuity was checked first in the right eye with left eye occluded and vice versa which was measured at a distance of 6 meters. The expression "6/6" refers to a person's normal visual acuity using the Snellen eye chart. The change in the visual acuity was interpreted as follows.

1. Interpretation of Snellen's Chart

Visual Acuity (meters)	Scores	Results
6/60	1	High Myopia
6/36	2	High Myopia
6/24	3	High Myopia
6/18	4	Low Myopia
6/12	5	Low Myopia
6/9	6	Low Myopia
6/6	7	Normal Vision

2. Bates Exercise

Bates exercise was found by Dr. William Horatio Bates. He explained that the clear seeing of near objects is by the work of the two (external) oblique muscles flattening (lengthening) the eyeball (just as when sitting on a ball), and the process of seeing clearly the distanced objects is by the work of four (external) rectus muscles pulling ("shortening") the eye in the opposite direction. Bates exercises refers to the series of eye exercise for children which include sunning, palming, swinging, simple blinking and simple eye exercises for improving the visual acuity among children with myopia.

6.6 Data collection strategy

Formal administrative permission will be obtained from the principals of selected schools in Indore to conduct the final study. The data will be collected (168 samples) with the help of demographic data, and the level of vision will be assessed by the Snellen chart. On the first day, the researcher explained the Bates exercise by using the pamphlet.

6.7. Planning and analysis of the data:

The data will be collect and analyse by using descriptive and inferential statistical methods. The mean and standard deviation will be used to describe the characteristics, and a paired "t" test will be used to find the effect of Bates eye exercises on visual acuity. The Chi-Square test will be used to determine the relationship between myopia level and the variables chosen.

The analysis of the qualitative data will be conducted through thematic analysis.

VII. SUMMARY

Myopia, or near-sightedness, is a prevalent visual impairment among school-age children. In recent years, there has been growing interest in non-pharmacological and non-surgical approaches to managing myopia. Among these, therapeutic eye exercises have been proposed as a means to not only improve visual acuity but also to alleviate associated symptoms such as eye strain and headaches. This study was designed with a dual purpose: (1) to quantitatively assess whether a structured Bates exercise regimen could significantly improve the visual capacity of children with myopia, and (2) to qualitatively explore the experiences and perceptions of these children regarding their academic and social life in relation to their vision. Conducted in several schools in the Indore district, this mixed methods study used a convergent parallel design to integrate both numerical data and personal narratives to provide a comprehensive picture of the intervention's impact.

Study Sites and Participant Selection

The research was carried out across multiple educational institutions in Indore. The pilot study and part of the main study were conducted at Mount Index International School, while the primary data collection for the main study took place at The Emerald Heights International School, Sri Sathya Sai Vidya Vihar, and Choithram International School. This selection of schools provided a varied yet contextually similar setting, ensuring that the findings would be applicable to a broader spectrum of children within the district.

Convergent Parallel Design

The study employed a convergent parallel mixed methods design, meaning that both quantitative and qualitative data were collected concurrently. The primary advantage of this design is that it allows for the validation and enrichment of numerical data with rich, narrative insights. In this study, while quantitative data provided clear evidence of any changes in visual acuity, the qualitative data offered context regarding how these changes affected the children's daily academic and social lives.

Quantitative Methodology**Pre-Intervention Assessment:**

Prior to administering any treatment, the children's vision was assessed using a Snellen chart—a standard tool for measuring visual acuity. This initial measurement provided a baseline against which post-intervention improvements could be compared. The children's visual acuity was recorded for both the right and left eyes, with readings including various levels (e.g., 6/6, 6/9, 6/12, 6/18, 6/24, 6/36, and 20/40 or better).

Intervention – Bates Exercises

Following the baseline assessment, the children participated in a therapeutic regimen based on the Bates method. The intervention consisted of a series of eye exercises administered twice daily over a period of four weeks. The researcher personally visited the classrooms to implement the intervention, and children were also instructed to repeat the exercises at home under parental supervision. This dual approach ensured consistency in the exercise routine and promoted adherence to the program.

Post-Intervention Assessment:

After 30 days of the exercise regimen, the children's vision was reassessed using the same Snellen chart. This allowed the researchers to measure any changes in visual acuity attributable to the intervention.

Statistical Analysis:

The study used a one-group pre-post-test design for its quantitative analysis. A paired t-test was employed to compare the visual acuity scores before and after the intervention. The analysis was carried out separately for each eye. Reported t-values—24.418 for the right eye and 16.858 for the left eye—were both highly significant ($p < 0.001$), suggesting that the improvements observed in visual capacity were statistically robust. In addition, the study explored potential associations between the severity of myopia and various demographic and lifestyle variables (e.g., age, gender, parental education, reading habits, and electronic device usage) using Chi-square tests.

Qualitative Methodology**Data Collection:**

In parallel with the quantitative phase, qualitative data were gathered through semi-structured interviews with a sub-sample of the participants. These interviews were designed to capture the personal experiences and subjective perceptions of children with myopia. Questions focused on the children's academic experiences, lifestyle choices, and the overall impact of myopia on their physical, mental, and social well-being.

Data Analysis:

The qualitative responses were analyzed using thematic analysis. The data were categorized into several themes, which were then grouped into three major clusters that encapsulated the multidimensional impact of myopia on the children's lives.

This approach not only highlighted the clinical improvements observed after the intervention but also provided insights into the broader quality-of-life issues associated with visual impairment.

Demographic Profile and Baseline Characteristics

A closer look at the demographic profile of the 168 participants reveals important contextual details that help explain the study's findings:

Age Distribution:

A majority of the children (116) were 9 years old, making this the largest single age group. The next largest group comprised children aged between 10 and 11 years (52 children).

Gender Breakdown:

The sample included 80 males and 88 females, providing a nearly balanced representation of both genders.

Academic Grade:

Of the total participants, 112 were in the fifth grade, while 56 were in the fourth grade. This distribution is important because academic pressure and related visual demands can vary by grade.

Parental Demographics:

The average age of the parents was found to be 36 years, with mothers typically between 25 and 35 years old. In terms of education, 96 fathers and 76 mothers had completed high school, while a smaller proportion (16 fathers and 12 mothers) held bachelor's degrees. Employment status varied slightly, with 108 fathers working outside the home compared to 104 mothers.

Lifestyle and Recreational Interests:

The study also gathered data on children's interests and extracurricular activities. Out of the total responses, 52 children expressed no particular interest in hobbies, while 36 showed an affinity for visual arts. Other activities mentioned included dance and television viewing, although singing was noted by only one participant. When asked about play, a significant majority (144 responses) favored outdoor play over indoor activities.

Visual Habits and Usage Patterns:

Baseline data regarding visual capacity and habits revealed that a considerable number of children had been using eyeglasses for 1–3 years. Additionally, while some children demonstrated an understanding of optical power, the majority (132 out of 168) were entirely unfamiliar with the concept. Other lifestyle factors such as duration of TV watching, computer usage, and preferred viewing distance were also documented, offering insights into potential contributors to visual strain.

Quantitative Findings

Pre-Intervention Visual Acuity

Before the exercise regimen began, the children's vision was measured in detail. The results indicated a wide variation in visual acuity:

Right Eye:

44 children had a visual acuity of 6/18 or better.

32 children had acuity at 6/24, and another 32 at 6/12.

Additionally, 20 children were noted to have vision at 6/36, 20 at 6/9, and 20 at 6/6.

Importantly, no child had vision better than 20/40.

Left Eye:

Visual acuity measures included 44 children with 20/20 vision or better, 40 with 20/9, and 28 with 20/24.

A smaller group of 24 children had 6/12 vision, 12 had 6/6, and 12 had 6/36 vision.

Again, the best recorded vision did not exceed 20/40.

In terms of myopia severity, the findings revealed that 96 children had low myopia in the right eye and 108 in the left eye, while 52 were classified as having severe myopia in the right eye and 40 in the left. Only 20 children were found to have healthy vision in both eyes.

Post-Intervention Visual Acuity

After a month of practicing the Bates exercise regimen:

Right Eye Improvements:

64 children achieved normal vision.

48 children had a visual acuity of 6/18.

24 children improved to 6/12, and 16 children had acuity readings of 6/24 and 6/9.

Left Eye Improvements:

42 children reached 6/6 vision.

48 children had 6/18 vision.

36 children reached 6/9.

Additionally, 12 children achieved perfect 20/20 vision, and 20 reached 6/12 vision.

When categorizing the children based on the severity of myopia after the intervention, 88 were identified with mild myopia, 52 exhibited normal vision, and 12 continued to have extreme myopia in the right eye; similar distributions were observed in the left eye.

Statistical Analysis and Significance

The paired t-test conducted for both eyes revealed that the improvements were statistically significant. For the right eye, the t-value of 24.418 was considerably higher than the critical value at the 0.001 significance level, while the left eye recorded a t-value of 16.858. These figures indicate that the differences in visual acuity measured before and after the intervention were not due to chance but were a direct consequence of the Bates exercises. The analysis robustly supports the study hypothesis that the exercise regimen leads to significant improvements in the visual capacity of children with myopia.

Association Analysis

In an attempt to determine whether other factors might be related to the severity of myopia, the study also applied the Chi-square test. Variables such as age, gender, academic grade, parental use of glasses, reading habits, television watching duration, viewing distance, and computer usage were examined. The results showed no statistically significant associations between these factors and the severity of myopia in either eye. This suggests that the improvements observed were more likely attributable to the intervention rather than to external lifestyle or demographic variables.

While the quantitative phase provided objective measures of visual improvement, the qualitative phase enriched the study by offering insight into the personal experiences of the children.

Participant Experiences

A sub-sample of children, comprising 12 boys and 8 girls with myopia, participated in semi-structured interviews. These discussions delved into various aspects of their day-to-day lives:

Academic Impact:

Many of the children reported difficulties in classroom settings, where reduced visual acuity affected their ability to read textbooks and participate fully in class. After engaging in the Bates exercise regimen, several children noted an improvement in their ability to focus on the board and read materials, which they associated with increased academic satisfaction.

Physical and Mental Well-Being:

Beyond academic performance, the children described the overall physical discomfort they experienced due to myopia. Frequent headaches and eye strain were common complaints prior to the intervention. Post-intervention, many students felt a decrease in these symptoms, which contributed to a better quality of life.

Social and Recreational Activities:

The interviews also revealed that myopia had broader social implications. For instance, some children reported avoiding outdoor activities and play because of the challenges they faced with impaired vision. Conversely, following the intervention, improvements in visual clarity led to a greater willingness to engage in recreational activities, enhancing their social interactions and overall mood.

Thematic Analysis

The qualitative data were analyzed through thematic analysis, which resulted in the identification of three primary thematic groups:

Impact on Daily Life:

This theme encompassed the physical discomfort and mental stress associated with myopia. Children expressed that reduced vision not only hindered their academic performance but also limited their participation in social and physical activities.

Perception of the Intervention:

Many participants expressed positive views regarding the Bates exercises. They reported that the exercises were easy to perform and that the routine helped them feel more alert and less fatigued. The supportive role of parents—who supervised the home sessions—was also highlighted as a critical factor in ensuring the success of the intervention.

Hope and Improved Self-Confidence:

As visual acuity improved, children reported an enhanced sense of self-confidence. They felt more capable of meeting academic demands and were more inclined to engage in social activities. This boost in self-esteem was viewed as an important secondary benefit of the exercise regimen.

Overall, the qualitative findings underscored that the negative impacts of myopia extended well beyond mere clinical measurements. They affected the children's emotional well-being and social participation. The intervention, by improving

vision, indirectly contributed to a better quality of life—a factor that is particularly important for young students navigating the challenges of both school and social environments.

Discussion

The integration of both quantitative and qualitative findings provides a comprehensive view of the impact of Bates exercises on children with myopia. The significant improvements in visual acuity—demonstrated by robust t-test statistics for both eyes—indicate that the eye exercises are effective in enhancing visual performance. The quantitative data are further reinforced by the qualitative narratives, which reveal that the children not only experienced measurable improvements in vision but also enjoyed subjective benefits such as reduced headaches, improved academic focus, and a more positive outlook on daily activities.

The study's findings have several important implications:

Clinical Implications:

The statistically significant improvement in visual acuity suggests that Bates exercises may serve as a low-cost, non-invasive intervention for managing myopia in children. This is particularly relevant in contexts where access to advanced medical treatments may be limited.

Educational and Social Benefits:

Enhanced vision contributes directly to improved academic performance and participation in school activities. As many children reported better classroom engagement and a decrease in physical discomfort, these benefits could translate into better long-term educational outcomes.

Holistic Well-Being:

The qualitative data indicate that improvements in vision have far-reaching effects on the overall quality of life. Reduced eye strain and improved visual comfort can foster better mental health and encourage a more active lifestyle, which are critical factors during the developmental years.

Conclusion and Future Directions

In conclusion, this mixed methods study provides strong evidence that a structured Bates exercise regimen can lead to significant improvements in the visual acuity of children with myopia. The quantitative analysis showed clear improvements in the Snellen chart measurements for both eyes, with statistical tests confirming that these changes were significant. Complementing these findings, the qualitative analysis revealed that improved vision was associated with enhanced academic performance, reduced physical discomfort, and better social interactions—all of which contribute to an improved quality of life.

The study highlights the potential of non-invasive, low-cost interventions in managing myopia, particularly in resource-constrained settings. It also underscores the importance of integrating quantitative measures with qualitative insights to obtain a holistic understanding of treatment outcomes.

For future research, it would be beneficial to extend the duration of follow-up to assess the long-term sustainability of the benefits observed. Additionally, employing a randomized controlled trial design could help to further isolate the effects of the intervention from other confounding factors. Researchers might also explore whether similar improvements can be observed in different age groups or in children with varying degrees of myopia. Finally, investigating the underlying mechanisms by which Bates exercises improve visual acuity could lead to more targeted and effective therapeutic strategies.

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