ORIGINAL ARTICLE

A Quasi-Experimental Evaluation of Eye Health Education among Rural School Students

Mohd Yasir Zubair, Absar Ahmad, Shubham Upadhyay, Saira Mehnaz, Uzma Eram
Department of Community Medicine, Jawaharlal Nehru Medical College and Hospital, AMU Aligarh, Uttar Pradesh, India; 202002

CORRESPONDING AUTHOR
Mohd Yasir Zubair, Department of Community Medicine, Jawaharlal Nehru Medical College and Hospital, AMU Aligarh, Uttar Pradesh, India; 202002
Email: yasmuhsin@gmail.com

CITATION
Zubair MY, Ahmad A, Upadhyay S, Mehnaz S, Eram U. A Quasi-Experimental Evaluation of Eye Health Education among Rural School Students. Journal of the Epidemiology Foundation of India. 2026;4(3):270-276.
DOI: https://doi.org/10.56450/JEFI.2026.v4i03.009
ARTICLE CYCLE
Received: 18/01/2026; Accepted: 05/09/2026; Published: 30/09/2026
COPYRIGHT STATEMENT
© The Author(s), [2026]. Published by the Journal of the Epidemiology Foundation of India (JEFI) under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

Abstract
Objective: To assess baseline knowledge, attitudes, and practices regarding eye health among rural school students and to evaluate the effect of an eye health education intervention on these parameters. **Design:** Single-arm pre–post quasi-experimental study. **Setting**: Government junior high schools in a rural area, Aligarh, Uttar Pradesh, India. **Method**: Two randomly selected schools were included, and 175 students who completed both baseline and follow-up surveys formed the final sample. A pretested, semi-structured questionnaire assessed eye health-related knowledge, attitudes, and practices, followed by a structured health education session using posters, charts, and other IEC materials. Post-assessment was done 3 months after the intervention. **Results:** Significant improvements were observed across KAP indicators: awareness of at least one ocular symptom increased from 65.3% to 88.2%($p<0.001$), Myopia awareness from 25.3% to 66.0%($p<0.001$), and eye donation from 24.0% to 83.3%($p<0.001$). Attitudinal improvements included reduction in stigma related to spectacle use from 25.3% to 10.4%($p<0.001$) and increased support for peers wearing glasses from 60.7% to 91.7%($p<0.001$). Regular outdoor activity increased from 70.0% to 84.7%($p=0.002$), unsafe use of pharmacy/traditional eye-drops reduced from 34.0% to 20.8% ($p=0.011$), and professional eye examination uptake rose from 40.0% to 56.9%($p=0.004$). **Conclusion:** The intervention produced substantial and meaningful improvements in eye-health literacy and behaviour among rural schoolchildren. Integrating eye-health education into routine school curricula, with periodic reinforcement and active involvement of teachers, parents, and health workers, can help reduce avoidable childhood visual impairment in resource-limited settings.

Keywords
Eye health education, School health, Vision screening, Health education intervention, Ocular health literacy

INTRODUCTION

Vision plays a critical role in every facet and stage of our lives. We may take vision for granted, but with impaired vision, we struggle to learn to walk, to read, to participate in school, and to work. Good ocular health significantly increases one's quality of life and happiness.[1] Undiagnosed and uncorrected refractive errors in childhood can negatively affect the development of vision and cause students to have low academic success and even quit school before graduation. For the past few decades, the prevalence of myopia in particular has increased at a rapid rate in Asia including India.[2]

Although genetic factors have traditionally been considered central to the occurrence of myopia, it is now recognised that modifiable external factors such as nutrition, lighting and lifestyle habits influence an individual's genetic susceptibility.[3]

In school-going children, much of the avoidable visual morbidity is linked to modifiable behavioural risk factors, such as prolonged near work and screen time, inadequate outdoor activity, poor dietary habits, unsafe use of eye drops from non-prescribed sources, delayed care seeking and the stigma attached to wearing spectacles, all of which can be addressed through health education. For instance, as per 2019 student health check-up statistics, 53.6% of middle school students and 38.6% of high school students reported a usage rate of the internet or computer games of 2 hours or more per day.[4] When looking at small-sized text on a smartphone screen, the blinking frequency decreases, which can cause eye health issues such as dry eyes and myopia.[5]

Prolonged exposure to screens may also cause lack of sleep and physical weakness and leads to adverse adult health outcomes.[6] In recent times, our eyes are continuously exposed to digital devices at near distance for extended periods, thus predisposing for myopia.[7] Schools offer a structured and easily accessible setting to reach children at an age when health habits and attitudes are forming, and school-based health education is a low-cost, scalable way to promote these modifiable behaviours (limiting screen time, outdoor activity, a healthy diet, safe eye care practices and timely care seeking) and to reduce spectacle-related stigma. Despite school screening programs, few studies in India have evaluated whether health education interventions can effectively improve ocular health knowledge and practices among rural students. Rural school children are particularly vulnerable due to lack of awareness and access. This study therefore aimed to assess and improve students' knowledge, foster positive attitude and practices on eye health among rural school students.

Objectives

1. To assess baseline knowledge, attitude and practices regarding eye health among school students.
2. To evaluate the effectiveness of health education intervention in improving these parameters

MATERIAL & METHODS

The single arm pre-post quasi-experimental study was conducted in Jawan Block of Aligarh district, Uttar Pradesh, India, between March and July 2024 (baseline survey in March 2024 and follow-up survey in July 2024). A total of 6 Junior high schools were identified in the field practice area of Rural Health Training Centre (RHTC), Department of Community Medicine, JNMCH, AMU. A sample of 171 children was estimated to be sufficient to estimate an expected proportion of 50% for adequate eye health awareness and healthy eye care practices (50% was assumed as the true proportion was not known, since it gives the maximum sample size), at a 95% confidence level and a relative precision of 15%. To attain this sample size, two schools were randomly selected by drawing lot. Students from class VI to VIII of the selected schools were eligible for inclusion if parental/caregiver consent (and student assent, where applicable) was obtained. Students whose parents/caregivers did not provide consent, who declined to participate, or who were absent at either the baseline or the follow-up survey were excluded. Prior permission was obtained from the school principals for participation of students. Parental/Caregiver consent was obtained through the school authorities. For

children aged 12 years and older assent was also obtained in addition to informed consent from parents/caregivers. Schools were visited on designated days. All data were collected by the principal investigator (PI) himself. Participants were helped by the PI to fill a predesigned, structured, paper-based questionnaire regarding their knowledge, attitude and practice (KAP) patterns pertaining to ocular health. The same paper-based, PI-assisted procedure was followed at baseline and follow-up. The questionnaire was self-developed by the investigators and was not adapted from an existing instrument; its items were framed around the topics covered in the intervention described below. The questionnaire underwent review by eye health experts and internal consistency was checked for the attitude domain (Cronbach's $\alpha = 0.83$), the only domain in which multiple items are combined into a composite score. The knowledge and practice questions are independent factual and behavioural items that are not used to measure an underlying construct or to make any diagnosis; hence Cronbach's α and formal validation were not considered necessary for these domains. A test and then a re-test of the questions was done by administering it to 25 children twice. After test-retest, the questions were revised for comprehension and clarity. The final KAP questionnaire was then used for the baseline data collection. Following this, the health education intervention described under was delivered. After 3 months of this intervention, re-assessment was done with the same questionnaire to study the impact of our intervention.

The Intervention: Health Education Booklet on Primary Eye Care (PEC) from Eye Health Education unit of Dr. Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi was used to prepare the education pamphlets and posters.[8] The materials covered the following areas: General measures to keep eyes healthy, education of refractive errors, taking care of glasses, nutrition & ocular health, early identification of vision loss, awareness about signs and symptoms of ocular problems, reducing screen time, spending time outdoors, prevention of ocular injuries, awareness about eye donation, and education about when and where to seek care. The intervention was delivered through an oral presentation using charts and posters by an Ophthalmologist. The intervention was delivered once only, as a single session of 45 minutes duration; no repeat or booster sessions were conducted. At the end of the session, Information, Education and Communication (IEC) materials were also distributed to the students. A single session was chosen for this evaluation on pragmatic grounds: it could be accommodated within the school timetable with minimal disruption to teaching, and it allowed assessment of a brief, low-cost and easily replicable model that can be scaled up through school health programmes. As behaviour change generally needs reinforcement, the practice outcomes after a single session are interpreted with caution and is mentioned as one of limitations of this study. Visual acuity assessment of all participants was done and any student with decreased vision was referred to the fortnightly eye clinic at rural health training centre, Jawan.

Ethics: Ethical clearance for the study was obtained from the Institutional Ethics Committee, JNMCH, AMU, Aligarh, UP.

Study tools

1. Snellen Chart
2. Posters and charts (IEC materials)
3. Torch light
4. Public address system
5. Structured, self-developed KAP questionnaire (paper-based)

Expected Outcomes

1. Improvement in knowledge and attitude regarding common ocular conditions and their causes.
2. Improvement in behaviours that will promote and prevent vision impairment such as spending time outdoors, wearing glasses, early seeking of care, nutritious diet etc.

Statistical analysis: Data collected was entered into a Microsoft Excel (2010) database. It was checked and corrected for any data entry errors. The data were analysed using the software SPSS version 23.0 (IBM Corp, Armonk, NY, USA). The summary of the data is presented as frequencies and percentages.

Each knowledge, attitude and practice item was coded as a binary variable (1 = correct/desirable response, 0 = incorrect/undesirable response). Attitude was additionally assessed as a composite score derived from the 3 point Likert-scale. As the same students were assessed before and after the intervention (paired data), the change in each binary item from pre- to post-survey was analysed using McNemar's chi-square test. The composite attitude score is based on ordinal Likert responses and was not found to be normally distributed, thus its change was therefore analysed using the Wilcoxon signed rank test.

Results

A baseline survey was conducted prior to the intervention in March 2024 and the follow up survey with the same questionnaire was conducted in July, 2024 to evaluate the change in Knowledge, attitude and practice of students pertaining to eye health. A total of 183 students participated in the baseline survey and 175 in the post intervention survey. These 175 students who participated in both pre and post survey were considered for final analysis. The mean age of students was 12.55 ± 1.48 years. Majority (64%, n=112) were females and 36% (n=63) were males.

Knowledge: Table 1 illustrates the frequency and percentage of students aware of various ocular health aspects at baseline and after the eye health education intervention. At baseline, 114 students (65.3%) could identify at least one ocular symptom, which improved significantly to 154 (88.2%) following the intervention ($p < 0.001$). Similarly, knowledge of at least one cause of eye problems rose from 147 (84.0%) to 164 (93.7%) students ($p = 0.008$), and awareness of at least one ocular disease increased from 132 (75.3%) to 149 (85.3%) ($p = 0.002$).

A focused area of improvement was awareness about myopia, with only 44 students (25.3%) aware prior to the intervention, increasing to 116 (66.0%) post-intervention. Eye donation awareness, rose from 42 students (24.0%) to 146 (83.3%) ($p < 0.001$).

Attitudinal shifts were also notable. Overall, The mean attitude score rose from 1.14 to 1.81 ($p<.001$). The proportion of students perceiving that wearing glasses indicated weakness dropped from 44 (25.3%) to 18 (10.4%) students ($p < 0.001$). Support for peers wearing spectacles increased substantially from 106 (60.7%) to 161 (91.7%) students ($p < 0.001$), pointing to an encouraging change. A greater number of students agreed on the positive role of a healthy diet for ocular health (111 to 154, $p < 0.001$). Awareness of risks from sharp objects showed high baseline recognition (155 students, 88.7%) with a some increase to 168 (95.9%). Importantly, knowledge about the advisability to avoid eye drops from local pharmacies or traditional practitioners improved significantly (from 98, 56.0% to 125, 71.5%, $p < 0.001$).

Practice: Table 2 presents behaviors related to eye health reported by students before and after the educational intervention. Regular face and eye washing was high at baseline (156 students, 89.3%) and showed a further increase to 168 students (95.9%). Outdoor activity participation exhibited a statistically significant increase, from 123 students (70.0%) at baseline to 148 (84.7%) post-intervention ($p = 0.002$).

Table 1: Knowledge and Attitude Regarding Eye Health

KNOWLEDGE	Baseline (n=175)	Follow-up (n=175)	P Value
Knows at least one ocular symptom	114 (65.3%)	154 (88.2%)	<0.001
Named at least one cause	147 (84.0%)	164 (93.7%)	0.008
Knows at least one ocular disease	132 (75.3%)	149 (85.3%)	0.002
Awareness about Myopia	44 (25.3%)	116 (66.0%)	<0.001
Awareness about Eye donation	42 (24.0%)	146 (83.3%)	<0.001
ATTITUDE			
Wearing glasses is a sign of weakness	44 (25.3%)	18 (10.4%)	<0.001
Supportive towards friends wearing glasses	106 (60.7%)	161 (91.7%)	<0.001

KNOWLEDGE	Baseline (n=175)	Follow-up (n=175)	P Value
Agree healthy diet favorable for eye health	111 (63.3%)	154 (88.2%)	<0.001
Playing with sharp objects injures eyes	155 (88.7%)	168 (95.9%)	0.08
Avoid local pharmacy/traditional eye drops	98 (56.0%)	125 (71.5%)	<0.001

Table 2: Practice Regarding Eye Health

Practice	Baseline (n=175)	Follow-up (n=175)	P Value
Regular face and eye washing	156 (89.3%)	168 (95.9%)	0.09
Regular outdoor play/activities	123 (70.0%)	148 (84.7%)	0.002
Avoid playing with pencil/sharp objects	155 (88.7%)	166 (95.1%)	0.10
Eat green leafy vegetables and fruits	144 (82.0%)	161 (91.7%)	0.014
Use eye drops prescribed to family members	15 (8.7%)	10 (5.5%)	0.30
Use eye drops from local pharmacy/ traditional	60 (34.0%)	36 (20.8%)	0.011
Ever had eye examination at eye clinic	70 (40.0%)	100 (56.9%)	0.004

Avoidance of playing with pencils or other sharp objects was already high at baseline (155 students, 88.7%), improving to 166 (95.1%) though not reaching statistical significance. Uptake of a vitamin A-rich diet improved considerably, from 144 (82.0%) to 161 (91.7%) students (p = 0.014).

Unsafe practices around eye drop use showed significant reductions. The proportion of students using eye drops prescribed to other family members decreased from 15 (8.7%) to 10 (5.5%). The use of eye drops from local pharmacies or traditional healers declined significantly from 60 (34.0%) students to 36 (20.8%) post-intervention (p = 0.011).

Lastly, the proportion of students who reported having undergone at least one professional eye examination increased significantly, from 70 (40.0%) to 100 (56.9%) students (p = 0.004).

Discussion

The control of childhood vision impairment is one of the priority concerns of the World Health Organization.[9] Our study was important in this light as this interventional study aimed to assess and improve the knowledge, attitude, and practice (KAP) of rural school students regarding ocular health through a targeted health education intervention. The results demonstrate significant improvements across various domains of eye health awareness, perception and behaviour, highlighting the effectiveness of school-based eye health education programs.

Knowledge:Generating Awareness: The study revealed a statistically significant enhancement in students' knowledge regarding ocular health after receiving school-based health education. Prior to the intervention, awareness of key symptoms and conditions such as red eye, diminished vision, and myopia was moderate, yet considerable gaps remained, including limited recognition of less obvious conditions (like squint) and knowledge of eye donation. Post-intervention, the proportion of students identifying at least one ocular symptom rose from 65.3% to 88.2%, and the ability to name at least one ocular cause or disease also increased notably. Of particular note is the dramatic increase in awareness about myopia (from 25.3% to 66%) and eye donation (from 24% to 83.3%). Similar improvements were reported in a study from Jalgaon, India.[10]

These improvements underscore the impact of targeted, age-appropriate educational content delivered in the school environment. Similar studies from other regions of India and LMICs have reported parallel outcomes that incorporating structured, health education sessions into the school curriculum raises health literacy and corrects misinformation around eye diseases and their prevention. This collective evidence supports continued and scaled investment in school-centric vision health education to bridge knowledge gaps especially concerning conditions that may be neglected due to their subtlety or prevalent myths.[11,12]

Attitude: Addressing Stigma and Strengthening Support: Baseline findings indicate significant misconceptions among students. One-fourth believed spectacles were linked to weakness or low intelligence reflecting strong sociocultural stigma surrounding refractive error. Similar concerns were reported from a study in China.[13] After the intervention, this attitude was drastically reduced (25.3% to 10.4%), and supportive attitudes toward classmates wearing glasses grew (60.7% to 91.7%). The mean attitude score improved from 1.14 to 1.81, highlighting both qualitative and quantitative gains.

Tackling these attitudinal roots is essential because reluctance to use spectacles in childhood can lead to persistent under-correction of refractive error, adversely affecting both educational attainment and psychosocial well-being. Response to this intervention aligns with international experience, which shows that destigmatization and normalization of eye care (particularly spectacle use) are critical to real-world uptake of vision interventions in children.[14] The study demonstrates that positive peer and family attitudes not only make eye health management more likely but may also radiate outward, influencing broader community norms through a child-to-child and child-to-family effect.

Practice: Translating Learning into Healthy Practice: There was notable progress in healthy eye practices following the educational intervention. The percentage of students actively engaging in outdoor play increased (from 70% to 84.7%), and a higher proportion reported regular intake of vitamin A-rich foods (82% to 91.7%). Particularly encouraging was the reduction in unsafe behaviors—self-use of relatives' prescribed eye drops declined, and use of over-the-counter or traditional remedies fell significantly (from 34% to 20.8%). Critically, more children underwent at least one professional eye examination (40% to 56.9%). These improvements were also reported in a similar study from Vietnam.[15]

The findings underscore the effectiveness of targeted, contextually relevant school eye health education in enhancing ocular health literacy and promoting preventive behaviors in rural children, supporting wider adoption of such interventions to reduce avoidable vision impairment through early awareness and care-seeking behaviors. These changes in practice mirror outcomes from similar interventional studies, which found that health education motivates not just intention but also facilitates action by identifying practical barriers and building self-efficacy. Increased outdoor play is particularly significant in light of growing global concern over rising childhood myopia, which has strong environmental as well as genetic determinants.[16]

Conclusion

In conclusion, the school-based eye health education program implemented in rural Aligarh effectively enhanced the knowledge, attitudes, and preventive practices regarding eye health among junior high school students. The significant improvements in awareness of ocular symptoms, reduction in spectacle-related stigma, and adoption of healthier practices such as increased outdoor activities and higher rates of professional eye examination demonstrate that structured and contextually appropriate educational interventions can play a crucial role in addressing avoidable childhood visual impairment in rural settings.

Recommendation

The study recommends the integration of eye health education into regular school health curricula with periodic refresher sessions to sustain and further improve eye health literacy. Active involvement of teachers, parents, and local health workers is essential to reinforce positive attitudes and support behavioral changes long-term. Moreover, policy-level endorsement and resource allocation for routine school-based eye screenings and timely referrals can amplify the impact of educational initiatives and contribute to the broader goal of reducing childhood visual morbidity in underserved populations.

Limitation of the Study

Several limitations should be considered in interpreting the findings of this interventional

study. First, the use of a single-group pre-post design without a control group limits the ability to attribute observed improvements solely to the intervention, as other external factors could have influenced outcomes. Additionally, the relatively short follow-up duration of three months restricts evaluation of long-term retention of knowledge, sustained attitudinal change, and continued practice adoption.

Authors Contribution

All authors have contributed equally.

Financial Support and Sponsorship

Nil

Conflict of Interest

There are no conflicts of interest.

Declaration Of Generative AI And AI Assisted Technologies In The Writing Process

The author has not used any generative AI/AI assisted technologies in the writing process.

References

1. Lee W, Ye K, Shin B. A study on the progression and prevalence of myopia according to age for the last five years: from 2008 to 2012. Journal of Korean Ophthalmic Optics Society. 2014;19(1):121-133. https://doi.org/10.14479/jkoos.2014.19.1.12
2. Baek S. Myopia prevalence in South Korean population: Review of the epidemiologic studies in Korea. Annals of Optometry and Contact Lens. 2017;16(2):51-57
3. Lee H, Choi Y. Recent advances in understanding the mechanisms of particulate matter-mediated ocular diseases. Journal of Life Science. 2020;30(8):722-730. http://doi.org/10.5352/JLS.2020.30.8.722
4. Ministry of Education in Korea. Statistics of 2019 student health check-up [Internet]. Seoul: Ministry of Education; 2020
5. Kim J, Hwang Y, Kang S, Kim M, Kim T, Kim J, et al. Association between exposure to smartphones and ocular health in adolescents. Ophthalmic Epidemiology. 2016;23(4): 269-276.
6. Chung E, Lee S. The multiple mediating effects of sleep duration and quality in the relationship between adolescent's smartphone addiction tendencies and depressive symptoms. Studies on Korean Youth. 2017;8(3):119-146.
7. Ye K, Lee W. A study on the actual condition of uncorrected refractive error of preschool children and adolescents. The Korean Journal of Vision Science. 2015;17(1):21-30.
8. Primary Eye Care. Community Ophthalmology Division. Dr. Rajendra Prasad Centre for Ophthalmic Sciences. Available from: Booklet RPC-28 June 2014 Output.pdf (aiims.edu) [Accessed on 20th Feb, 2024]
9. Gogate, P., Kalua, K. and Courtright, P. (2009) Blindness in childhood in developing countries: time for a reassessment? PLoSMedicine, 6, e1000177
10. Dharmendra Deoram Patil, Dilip Narayan Dhekale and Yashovardhan M. Kabra, 2024. Impact of Health Education on Preventive Eye Care in School Children: A Cross-Sectional Study in Public and Private Schools. Int. J. Trop. Med., 19: 60-64
11. Agrawal D, Tyagi N, Nagesh SR. Awareness Levels of School Teachers Regarding Healthy Vision and Eye Screening in Dist Gautam Budh Nagar, U.P.. Natl J Community Med 2018;9(8):614-617
12. VISION 2020 The Right to Sight – India. Vision Screening in School Children: A Comprehensive School Screening Manual. Gurgaon, Haryana: VISION 2020 The Right to Sight – India; 2014.
13. Li, L., Lam, J., Lu, Y., Ye, Y., Lam, D. S., Gao, Y. et al. (2010) Attitudes of students, parents, and teachers toward glasses use in rural China. Archives of Ophthalmology, 128, 759–765.
14. Gabriel Osei Anokye, Carlos Price-Sanchez, Ai Chee Yong, Majd Ali, Christopher Tate, Ronnie Graham, Ving Fai Chan. School-based eye health interventions for improving eye care and spectacles compliance in children in low- and middle-income countries: A scoping review. AJO International;Volume 2, Issue 2, 2025.
15. Paudel P, Phung TY, Kovai V, Naduvilath T, Ho SM, Giap NV, Holden BA. Effect of school eye health promotion on children's eye health literacy in Vietnam. Health Promotion International. 2019;34(1):113-122.
16. Zhang J, Deng G. Protective effects of increased outdoor time against myopia: a review. J Int Med Res. 2020 Mar;48(3):300060519893866.