

# An Analytical Study of Eye Vision and Spectacle Usage among Urban and Rural Adolescent Students

Dr. Asha Thoke<sup>1</sup>, Roshni Chowdhary<sup>2</sup>

<sup>1</sup> Associate Professor, Ashoka college of Education, Nashik

<sup>2</sup> Final year B.Sc. B. Ed student, Ashoka college of Education, Nashik

## I. INTRODUCTION

Vision plays a crucial role in the learning process, especially for school-aged children. Proper eyesight is essential for reading, writing, classroom participation, and overall academic performance. Refractive errors such as myopia, hyperopia, and astigmatism are common among young students and can be easily corrected with the use of spectacles. However, many students continue to experience untreated vision problems due to lack of awareness, limited access to eye-care services, and socio-cultural barriers.

Studies have shown noticeable differences in spectacle use between rural and urban students. Urban students generally have better access to eye check-ups, optical shops, and information related to vision care. In contrast, rural students often face challenges such as poor healthcare facilities, lower socio-economic status, and misconceptions about wearing spectacles. These factors may reduce the likelihood of identifying vision problems early and using corrective eyewear.

Understanding these differences is important because uncorrected vision problems can negatively impact a child's academic achievement, confidence, and long-term educational opportunities. By exploring the determinants that affect spectacle use among rural young students compared to urban students, this study aims to identify the key barriers and contribute to improving eye-health awareness and support systems in schools.

## II. NEED OF THE STUDY

Nowadays, many adolescent students suffer from eye vision problems like myopia (short-sightedness) due to increased use of mobile phones, computers, and television. Urban students usually spend more time on

screens and indoor activities, while rural students spend more time in outdoor activities. This difference may affect their eye vision. If vision problems are identified early, proper treatment<sup>3</sup>. Early detection is important: If vision problems are identified early, proper treatment like spectacles or eye exercises can help prevent further damage. Poor eye vision can affect students' reading ability, concentration, and overall academic performance. Many students and parents are not aware of eye care and the importance of regular eye check-ups, especially in rural areas. This study helps to find whether eye vision problems are more common in urban or rural adolescent students. The results of this study can help teachers, parents, and health authorities to take improving study necessary steps for eye health. Like spectacles or eye exercises can help prevent further damage. Poor eye vision can affect students' reading ability, concentration and overall academic performance. Many rural students may struggle academically due to untreated vision problems. Recognizing the factors affecting spectacle use can help schools address these hidden barriers to learning. Rural communities often lack information about the importance of regular eye check-ups. This study highlights the need for awareness programmes among parents, teachers, and students.

## III. REVIEW OF LITERATURE

1) Susmita Banerjee, Renu Magdum (2024)

A cross-sectional research study examines visual impairments prevalence in Pune District's urban and rural school children, recognizing environmental influences on visual development. "To compare visual functionality, in school-going children aged 6-12 years from urban and rural districts of Pune, aiming to identify potential disparities. A study evaluated 900

systematically selected school children (450 from urban, 450 from rural areas). Visual metrics were assessed: stereo acuity (Titmus test), amplitude of accommodation (RAF rule), refractive status (full spectacle correction), visual acuity (Snellen's chart), and color vision (Ishihara test). Statistical analysis employed descriptive statistics and chi-square tests. Result is demographic study of 900 participants from 7 Taluka schools in Pune, Maval Taluka had the highest representation (17.9%). Prevalence of myopia was higher in urban (94.8%) than rural (70.7%) areas, while hypermetropia was more common in rural (29.3%) than urban (5.2%) areas. Conclusion: The study found lower stereoacuity than refractive errors and amplitude of accommodation, with significant differences between urban and rural children, suggesting environmental influences.

2) Andi Kusnawan, Ine Renata Musa Andi Kusnawan (2015)

A cross-sectional research study was conducted among 94 high school students in two different schools, urban and rural areas during November 2012, using the simple random sampling technique. The study was performed through interviews and examination of visual acuity using Rapid Assessments of Avoidable Blindness. The collected data were analyzed using Mann-Whitney test. Results of the study is total of 93.6% of respondents had good visual acuity. Self-perception of the visual functioning test showed that most respondents gave good answer. The statistical test using Mann-Whitney showed that there was no difference in level of visual acuity and self-perception of visual function between urban and rural students ( $p > 0.05$ ). Conclusions: Most of the high school students have good visual acuity and good self-perception of their visual function but there is no difference between rural and urban areas

3) Omung Bhardwaj<sup>1</sup>, Nitin Batra (2020)

A research study conducted in Ludhiana to assess the spectrum of ocular morbidity in rural and urban screening eye camps. Blindness and visual impairment remain major public health problems in India. To address this issue, the National Programme for Control of Blindness (NPCB) was launched in 1976 with the aim of reducing the prevalence of avoidable blindness. According to the NPCB survey (2011), the major causes of ocular morbidity in India

include cataract (62.6%), refractive errors (19.7%), glaucoma (5.8%), posterior segment disorders (4.7%), corneal blindness (0.9%), surgical complications (1.2%), and other causes (5%). Various studies conducted across India have reported that cataract and refractive errors are the leading causes of ocular morbidity and visual impairment. Uncorrected refractive errors are particularly common among younger individuals, while cataract is more prevalent in older populations. Glaucoma is another significant cause of irreversible blindness, often remaining undetected until advanced stages.

#### IV. OBJECTIVES OF THE STUDY

1. To assess and compare the eye health of rural and urban school students.
2. To study the prevalence of common eye problems (such as refractive errors, eye strain, redness, watering, etc.) among school students.
3. To examine the influence of lifestyle factors (use of digital devices, reading habits, Food habits and lighting conditions) on the eye health of school students.

#### Scope of the Study

1. This study focuses on comparing the eye vision level of adolescent students from urban and rural areas.
2. It includes students within a specific age group (generally 10–19 years) studying in selected schools.
3. The study helps identify differences in vision problems such as myopia, hyperopia, or general visual acuity between urban and rural adolescents.
4. It may help understand factors affecting eye vision such as screen time, study habits, outdoor activities, and lifestyle differences.

#### V. LIMITATIONS OF THE STUDY

1. The study may be limited to a small sample of students from selected schools, so the results may not represent all adolescents.
2. The research may be conducted in a specific geographic area, which limits generalization to other regions.

3. Vision assessment might rely on basic screening methods rather than detailed clinical eye examinations.
4. The study depends on self-reported information from students (such as screen time)

## VI. RESEARCH METHODOLOGY

### Research approach

The research approach adopted for the present study was quantitative research approach, this approach would help the investigator to determine eye problems among rural and urban high school students.

### Research design

Research design used for the present study in non-experimental two group descriptive correlational design to assess the level eye health and lifestyle factors among school students.

### Research Setting:

The present study was conducted at govt schools, Silvassa, Dadra and Nagar Haveli and private schools from Nashik, MH.

### Population

The population for the study were school students from the selected schools of Dadra and Nagar haveli and Nashik.

### Sample, Sample size and sampling technique

In this study, the total population consisted of approximately 250 students from schools in Dadra and Nagar Haveli and Nashik. From this population, a sample of 80 students was selected. The sample included 40 students from rural schools and 40 students from urban schools. The students were selected from classes 6th to 12th (age group 11–19 years).

In the present study, a stratified probability sampling technique was used to select the sample.

### Research tool

1. Questionnaire: Used to collect information from students about eye health and lifestyle habits.
2. Snellen Chart: Used to test the visual acuity of the students.

Parameters/variables	Methods	sample	Methods of sampling	Tools of data collection
Eye vision assessment among students	Vision testing	Urban and rural school students	Stratified probability sampling	Snellen chart
Spectacle usage and awareness among students	Questionnaire survey	Urban and rural school students	Stratified probability sampling	Questionnaire
Comparison of eye vision and spectacle usage between urban and rural students	Comparative analysis	80 students (40 urban + 40 rural)	Stratified probability sampling	Questionnaire & Snellen chart

### Data analysis

Table 1: family spectacles usage & academic awareness

Parameters	Study group		P-value
	Urban (N=40)	Rural (N=40)	
Family members wear spectacles	67.5	35	0.001
Family members do not wear spectacles	32.5	65	0.001
Poor vision affects academic performance – Yes	40	42.5	0.88
Poor vision affects academic	40	37.5	0.88

performance – No			
Poor vision affects academic performance – Not sure	20	20	0.88
Parameter	Urban (%)	Rural (%)	P-value

2) Table 2: knowledge about spectacles usage

Parameters	Study group		P-value
	Urban (N=40)	Rural (N=40)	
Spectacles correct most vision problems – Agree	65	42.5	0.05
Spectacles correct most vision problems – Disagree	27.5	40	0.05
Spectacles correct most vision problems – Not sure	7.5	17.5	0.05
Wearing spectacles can make eyesight worse – Agree	20	20	1
Wearing spectacles can make eyesight worse – Disagree	50	40	0.42
Wearing spectacles can make eyesight worse – Not sure	30	40	0.42
Eye examination should be done every 6 months	52.5	70	0.12
Eye examination should be done once a year	25	27.5	0.84

Table :3) attitude towards spectacles usage

Parameters	Study group		P-value
	Urban (N=40)	Rural (N=40)	
Comfortable wearing spectacles	60	32.5	0.03

Spectacles make look unattractive	37.5	55	0.04
Friends make fun of spectacles users	47.5	57.5	0.3
Spectacles help see better in class	72.5	57.5	0.12
Embarrassed to wear spectacles	32.5	52.5	0.05
Would wear spectacles regularly if prescribed	70	52.5	0.08

Table 4): practices /Behaviour

Parameters	Study group		P-value
	Urban (N=40)	Rural (N=40)	
Ever had eye test	82.5	2.5	0.001
Last eye test <6 months	27.5	2.5	0.001
Need spectacles	32.5	5	0.001
Use spectacles daily	55	35	0.09
Poor fit / discomfort as reason for irregular use	20	37.5	0.12

Table 5): Lifestyle factors affecting eye vision

Parameters	Study group		P-value
	Urban (N=40)	Rural (N=40)	
Mobile phone usage <1 hour	50	50	1
Mobile phone usage 1–2 hours	37.5	27.5	0.34
Continuous screen usage	50	25	0.04
Eye strain often	45	5	0.001
Study in proper lighting	75	80	0.61
Use LED / tube lights	82.5	0	0.001
Study in lying position – Never	50	75	0.07

Outdoor activity >4 hours	0	82.5	0.001
Participate in outdoor sports daily	45	100	0.001
Green leafy vegetables daily	0	97.5	0.001
Fruits daily	42.5	50	0.57
Milk / eggs / nuts regularly	87.5	67.5	0.08
Junk food – often	50	12.5	0.01
Water intake 4–6 glasses	62.5	45	0.14

Table 6): Assessment of Vision Level of Urban and Rural Students using Snellen Chart:

Parameters	Study group	
	Urban students	Rural students
Normal/ perfect	30%	80%
Slightly poor	30%	12.5%
Partially weak	12.5%	5%
Weak	12.5%	2.5%
Poor/ very poor	15%	0%

VII. FINDING

Objective 1) To assess and compare the eye health of rural and urban school students.

1). According to the students’ responses, 67.5% of urban students reported that their family members wear spectacles, while 32.5% reported that they do not. In contrast, in rural areas, 35% of students reported that their family members wear spectacles, whereas 65% reported that they do not.

2). According to the students’ responses, 40% of urban students agreed that poor vision can affect academic performance, while 40% disagreed and 20% were not sure. In rural areas, 42.5% of students agreed that poor vision can affect academic performance, 37.5% disagreed, and 20% were not sure.

3). According to the students’ responses, 65% of urban students agreed that spectacles can correct most vision problems in children, while 27.5% disagreed and 7.5% were not sure.

In rural areas, 42.5% of students agreed, 40% disagreed, and 17.5% were not sure about this statement.

4). According to the students’ responses, in urban areas, 20% of students agreed that wearing spectacles can make eyesight worse, while 50% disagreed and 30% were not sure.

In rural areas, 20% of students agreed, 40% disagreed, and 40% were not sure about this statement.

5). In urban students, none of the students reported undergoing an eye examination every 6 months. About 25% of urban students undergo an eye test once a year, 37.5% get an eye test only when they have vision problems, and 37.5% are not sure about the frequency of eye examination.

In rural students, again none undergo an eye test every 6 months. Only 5% get an eye test once a year, 2.5% get tested only when there is a vision problem, and a large majority, 92.5%, are not sure about when an eye examination should be done.

6). In urban areas, 60% of students agreed or strongly agreed that they feel comfortable wearing spectacles, whereas in rural areas 32.5% of students agreed or strongly agreed, indicating higher comfort among urban students.

7). In urban areas, 37.5% of students disagreed or strongly disagreed with this statement, while in rural areas 55% of students agreed or strongly agreed, showing greater concern about appearance among rural students.

8). In urban areas, 47.5% of students agreed or strongly agreed, whereas in rural areas 57.5% agreed or strongly agreed that classmates make fun of students who wear spectacles.

9). A majority of students agreed with this statement, with 72.5% urban students and 57.5% rural students agreeing that spectacles help improve vision in class.

10). In urban areas, 32.5% of students agreed or strongly agreed, while in rural areas 52.5% agreed or strongly agreed, indicating higher embarrassment among rural students.

11). In urban areas, 70% of students agreed or strongly agreed, compared to 52.5% of rural students, showing a more positive attitude toward regular spectacle use among urban students.

Objective 2) To study the prevalence of common eye problems (such as refractive errors, eye strain, redness, watering, etc.) among school students.

1). 82.5% of urban students have had their eyes tested, while only 2.5% of rural students have undergone an eye examination, showing better eye-care practices

among urban students. Most rural students have never had an eye test.

2). In urban areas, 27.5% of students had an eye test within 6 months, while 45% did not remember their last eye test. In rural areas, only 2.5% of students reported having an eye test, showing very limited eye-check practices.

3). In urban areas, 32.5% of students reported needing spectacles, while 52.5% said no and 15% were not sure. In rural areas, only 5% reported needing spectacles, whereas 52.5% were not sure, indicating lower awareness about vision needs among rural students.

4). In urban areas, 55% of students use spectacles daily, while in rural areas only 35% use them regularly, showing better spectacle-use practices among urban students.

5) Poor fit or discomfort (37.5% rural, 20% urban) was the main reason for irregular spectacle use. A similar proportion (25%) in both areas felt spectacles were not needed, while regular use was higher among urban students (37.5%) compared to rural students (15%).

6) In urban areas, 50% of students wear spectacles, while 45% do not and 5% wear them sometimes. In rural areas, none of the students wear spectacles, and 100% reported not using spectacles.

Objectives 3) To examine the influence of lifestyle factors (use of digital devices, reading habits, Food habits and lighting conditions) on the eye health of school students.

1). The data shows that 50% of both urban and rural students use mobile phones for less than 1 hour daily. In urban areas 37.5% use phones for 1–2 hours, while 27.5% rural students fall in this category. Only a small number of students use mobile phones for 3–4 hours or more, indicating limited screen exposure.

2). The data shows that in urban areas, 50% of students use screens continuously without breaks, while the other 50% take breaks. In rural areas, only 25% of students use screens continuously, whereas 75% do not, indicating healthier screen-use habits among rural students.

3). The data shows that 45% of urban students often experience eye strain after screen use, while only 5% of rural students reported the same. In rural areas, 50% of students never experience eye strain, indicating

lower screen-related eye problems compared to urban students.

4) The data shows that 75% of urban students and 80% of rural students study in proper lighting conditions. Only 25% urban and 20% rural students reported studying without proper lighting, indicating that most students in both areas follow good lighting practices while studying.

5). The data shows that 82.5% of urban students use LED or tube lights while studying, whereas 75% of rural students depend on natural light. Only a small percentage of students in both areas study in dim lighting conditions.

6). The data shows that 50% of urban students and 75% of rural students never study in a lying position. A smaller proportion of students reported studying in a lying position often or sometimes, indicating that most students follow proper study posture.

7). The data shows that most urban students (55%) spend 1–2 hours outdoors daily, while 82.5% of rural students spend more than 4 hours outdoors. This indicates that rural students have much higher outdoor exposure and physical activity compared to urban students.

8). The data shows that 100% of rural students participate in outdoor sports daily, while in urban areas 45% participate daily and 50% sometimes. This indicates that rural students are more regularly involved in outdoor physical activities compared to urban students.

9). The data shows that 97.5% of rural students eat green leafy vegetables daily, while 62.5% of urban students consume them weekly. This indicates that rural students have more regular consumption of green leafy vegetables than urban students.

10). The data shows that 50% of rural students eat fruits daily, compared to 42.5% of urban students. A higher percentage of urban students (20%) never eat fruits, while only 7.5% of rural students reported the same, indicating slightly better fruit consumption habits among rural students.

11) . The data shows that 87.5% of urban students regularly consume milk, eggs, or nuts, while 67.5% of rural students reported the same. This indicates that urban students have slightly better access to these nutritious foods compared to rural students.

12). The data shows that 50% of urban students often eat junk food, while only 12.5% of rural students reported the same. In rural areas, 25% of students

rarely or never consume junk food, indicating healthier eating habits compared to urban students.

13). The data shows that most urban students (62.5%) drink 4–6 glasses of water daily, while in rural areas 45% students fall in this category. A considerable number of rural students (30%) drink 6–8 glasses of water, indicating relatively good hydration habits in both groups.

#### VIII. CONCLUSION

The study concludes that there is a difference in eye vision between urban and rural adolescent students. Urban students showed a higher percentage of vision problems compared to rural students. Rural students had a higher percentage of normal vision. The study also shows the importance of regular eye check-ups and awareness about spectacle usage among students. Proper eye care and healthy lifestyle habits can help maintain good vision.

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