



Original Research Article

PREVALENCE OF PRESBYOPIA AND ITS CORRECTIVE OPTIONS: A CLINICAL STUDY IN UTTAR PRADESH, INDIA

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Abstract: **Background:** Presbyopia is an age-related visual impairment that affects near vision and can significantly reduce quality of life if uncorrected. **Objective:** This study aimed to assess the prevalence of presbyopia, patterns of corrective option utilization, and barriers to correction across different age groups, genders, and residential settings. **Methods:** A population-based cross-sectional study was conducted among 3,000 individuals aged 40 years and above from urban and rural areas. Data on presbyopia prevalence, use of corrective measures, and perceived barriers were collected and analyzed. **Results:** The overall prevalence of presbyopia was 78.6%, increasing with age and higher among females than males. Rural populations showed a higher prevalence (81.9%) compared to urban populations (74.5%). Eyeglasses were the most commonly used corrective option (52.0%), though a substantial proportion (43.0%) reported no correction, particularly in rural areas. Financial constraints, lack of awareness, and limited service availability were the major barriers to correction. **Conclusion:** Presbyopia is highly prevalent, especially in older adults and rural populations, highlighting the need for improved access to affordable eye care and community-based interventions.

Keywords: Presbyopia; Prevalence; Near vision impairment; Corrective options; Eyeglasses; Barriers to eye care; Rural and urban population; Aging; Visual impairment; Eye health services

INTRODUCTION

Presbyopia is a universal, age-related physiological process characterized by the progressive loss of the eye's accommodative ability, leading to a diminished capacity to focus on near objects. Derived from the Greek words *presbys* ("old") and *ops* ("eye"), it is often the first clinical sign of aging experienced by the human visual system (StatPearls, 2025). The condition typically manifests in the early to mid-40s as the crystalline lens loses its elasticity and the ciliary muscle strength declines, moving the near

point of accommodation beyond the functional reading distance (Wikipedia, 2024).

1.1 Global and National Burden

Globally, presbyopia is a public health concern of significant magnitude, affecting approximately **1.8 billion people**, a figure projected to exceed **2.1 billion by 2030** (WHO, 2024). In India, the burden is particularly high due to a rapidly aging population and a high prevalence of uncorrected refractive errors. National estimates suggest that nearly one-

third of the adult population in India suffers from uncorrected presbyopia, which serves as a leading cause of avoidable near-vision impairment (Mishra et al., 2022).

1.2 Regional Context: Uttar Pradesh

In the state of Uttar Pradesh, the prevalence of presbyopia reflects the complex interplay of demographic and socioeconomic factors. Recent clinical studies in districts like Kanpur and Kasganj have reported prevalence rates ranging from **42.7% to 42.9%** among adults aged 35 and above (Malhotra et al., 2022; Buttan et al., 2025). Despite this high prevalence, the **spectacle coverage rate remains alarmingly low, often below 26%**, indicating a massive unmet need for vision correction in the region. Barriers such as lack of awareness, "low perceived need," and limited access to primary eye care services in rural clusters exacerbate the disability (Buttan et al., 2025).

1.3 Corrective Options and Challenges

The management of presbyopia has evolved from simple optical aids to advanced surgical interventions. While **single-vision reading glasses, bifocals, and progressive addition lenses (PALs)** remain the mainstays of treatment, newer options such as multifocal contact lenses and refractive surgeries (e.g., PresbyLASIK or multifocal IOL implants) are increasingly available (CRSToday, 2021). However, in the socio-economic landscape of Uttar Pradesh, the adoption of advanced options is

hindered by high costs and a lack of awareness regarding progressive technologies (Sah et al., 2025). This clinical study seeks to evaluate the current prevalence of presbyopia within Uttar Pradesh and analyze the utilization patterns of various corrective options to provide data-driven insights for improving ophthalmic service delivery in Northern India.

Materials and Methods

This cross-sectional study was conducted between January 2022 and December 2023 across diverse urban and rural regions of Uttar Pradesh, targeting a population of adults aged 40 years and older. To ensure a comprehensive demographic representation, participants were stratified based on age, gender, occupation, and socioeconomic status. Data collection involved a multi-faceted approach: clinical vision assessments were performed using Snellen charts to measure near-vision acuity alongside thorough ocular examinations, while structured interviews and questionnaires were administered to gather details regarding symptoms, occupational requirements, and the availability of corrective measures. Furthermore, detailed demographic profiles—including educational attainment and socioeconomic status—were recorded for each participant. The resulting data were subjected to statistical analysis using both descriptive and inferential methods; specifically, chi-square tests and logistic regression models were employed to identify significant relationships between demographic characteristics and the prevalence of presbyopia.

RESULTS

Prevalence of Presbyopia

The results of the study are presented in detail in the tables below, showing the prevalence of presbyopia and the distribution of corrective measures across demographic groups.

Table 1: Prevalence of Presbyopia by Age and Gender

Age Group (years)	Male e (%)	Female (%)	Overall (%)
40-49	42.0	48.5	45.2
50-59	69.3	75.6	72.8
60+	88.7	93.2	91.5
TOTAL	75.4	81.2	78.6

The table 1. shows that the prevalence of presbyopia increases steadily with age and is consistently higher among females than males across all age groups. In the 40–49 year age group, presbyopia affects 45.2% of the population, with a higher prevalence in females (48.5%) compared to males (42.0%). This prevalence rises markedly in the 50–59 year group to 72.8% overall, again with females (75.6%) more affected than males (69.3%). The highest prevalence is observed among individuals aged 60 years and above, where 91.5% are affected, including 93.2% of females and 88.7% of males. Overall, presbyopia affects 78.6% of the study population, with a greater burden among females (81.2%) than males (75.4%).

Table 2: Prevalence of Presbyopia by Region (Urban vs. Rural)

Region	Population Examined (n)	Presbyopia Cases (n)	Prevalence (%)
Urban	1500	1118	74.5
Rural	1500	1229	81.9
Total	3000	2347	78.6

The table 2 illustrates the prevalence of presbyopia by region, comparing urban and rural populations. A total of 3,000 individuals were examined, with equal representation from urban and rural areas. Presbyopia was identified in 1,118 urban participants, resulting in a prevalence of 74.5%, whereas rural areas recorded a higher number of

cases (1,229) and a greater prevalence of 81.9%. Overall, 2,347 individuals were affected, giving an overall prevalence of 78.6%. These findings indicate that presbyopia is more prevalent in rural populations compared to urban populations.

Table 3: Utilization of Corrective Options

Corrective Option	Urban Adoption (%)	Rural Adoption (%)	Overall Adoption (%)
Eyeglasses	60.2	43.8	52.0
Contact Lenses	5.2	0.8	3.0
Surgical Interventions	2.3	0.7	1.5
No Correction	32.3	54.7	43.0

The table 3 presents the utilization of corrective options for presbyopia in urban and rural populations. Eyeglasses are the most commonly used corrective option overall, with an adoption rate of 52.0%, and their use is notably higher in urban areas (60.2%) compared to rural areas (43.8%). Contact lenses are used by a small proportion of individuals, with an overall adoption of 3.0%, and minimal use in rural areas (0.8%) relative to urban areas (5.2%). Surgical interventions are the least utilized option, with an overall adoption rate of 1.5%, again more common in urban settings (2.3%) than rural settings (0.7%). A substantial proportion of individuals, particularly in rural areas, do not use any form of correction, with 54.7% reporting no correction compared to 32.3% in urban areas, resulting in an overall non-correction rate of 43.0%.

Table 4: Barriers to Correction of Presbyopia

Barrier	Urban Respondents (%)	Rural Respondents (%)	Overall Respondents (%)
Financial Constraints	40.8	68.2	54.5
Lack of Awareness	22.7	48.6	35.7
Limited Availability of Services	18.5	52.3	35.4
Preference for Alternative Method	11.2	8.9	10

The table 4 summarizes the barriers to the correction of presbyopia among urban and rural respondents. Financial constraints emerge as the most commonly reported barrier overall, affecting 54.5% of respondents, with a substantially higher proportion in rural areas (68.2%) compared to urban areas (40.8%). Lack of awareness is also a significant barrier, reported by 35.7% of respondents overall, and is more prevalent in rural populations (48.6%) than in urban populations (22.7%). Limited availability of services affects 35.4% of respondents, again disproportionately impacting rural residents (52.3%) compared to urban residents (18.5%). In contrast, preference for alternative methods is the least cited barrier, reported by 10.0% overall, with similar but slightly higher reporting in urban areas (11.2%) than rural areas (8.9%). Overall, the findings indicate that rural populations face greater barriers to presbyopia correction than urban populations.

DISCUSSION

The present study demonstrates a high prevalence of presbyopia, with a clear age-related increase, higher burden among females, greater prevalence in rural populations, suboptimal utilization of corrective measures, and multiple barriers to correction. These findings are largely consistent with existing literature and reinforce the persistent public health challenge posed by uncorrected presbyopia, particularly in low-resource settings.

The prevalence of presbyopia increased progressively with age, rising from 45.2% among individuals aged 40–49 years to 91.5% among those aged 60 years and above. This pattern aligns with global evidence indicating that presbyopia is an inevitable age-related condition caused by gradual loss of accommodative ability of the crystalline lens (Holden et al., 2015). Similar age-specific trends have been reported in population-based studies conducted in Africa and Asia, where prevalence exceeded 80% among adults aged 60 years and older (Sherwin et al., 2008; Marmamula et al., 2013).

The study also found a consistently higher prevalence of presbyopia among females compared to males. This observation is supported by previous studies suggesting that women may experience earlier onset or higher reported prevalence of presbyopia (Pointer, 1995; Patel & West, 2007). Possible explanations include biological differences, variations in near-work demands, and disparities in health-seeking behavior, although the exact mechanisms remain unclear.

A notable finding of this study is the higher prevalence of presbyopia in rural populations (81.9%) compared to urban populations (74.5%). This rural–urban disparity has been widely documented, with rural residents often experiencing both higher prevalence and greater unmet need for presbyopia correction (Holden et al., 2015; Bourne et al., 2017). Limited access to eye care services, lower socioeconomic status, and reduced awareness in rural areas may contribute to this difference.

Despite the high prevalence, utilization of corrective options was inadequate, particularly in rural areas. Eyeglasses were the most commonly used corrective option, yet overall adoption remained just above half of the affected population. Low use of contact lenses and surgical interventions is consistent with findings from previous community-based studies, which report spectacles as the most feasible and cost-effective correction method for presbyopia (Marmamula et al., 2013). The higher proportion of individuals reporting no correction in rural areas highlights persistent gaps in service delivery and uptake.

The barriers identified in this study—financial constraints, lack of awareness, and limited availability of services—mirror those reported in earlier research. Financial cost has been repeatedly identified as the leading barrier to presbyopia correction, particularly in low-income and rural settings (Patel & West, 2007; Sherwin et al., 2008). Lack of awareness regarding the condition and its simple correction further exacerbates underutilization, while limited availability of eye care services restricts access even among motivated individuals.

The findings of this study are consistent with existing evidence and underscore the need for targeted interventions to address presbyopia, particularly in rural communities. Strategies such as affordable spectacle provision, community-based screening, and health education initiatives are essential to reduce the burden of uncorrected presbyopia and improve quality of life.

Conclusion:

In Uttar Pradesh, presbyopia is very common, and there are a lot of unmet demands for remedial therapies, especially in rural regions. Targeted initiatives are needed to address this issue, such as more accessible healthcare, community education, and reasonably priced vision care options. The burden of presbyopia in this area can be considerably decreased by cooperation between local groups, legislators, and healthcare professionals.

REFERENCES:

- Buttan, S., Sahu, A. B., & Prasannakumar, P. N. (2025). Measuring the prevalence of uncorrected refractive errors and refractive error coverage among the young working age population in Kasganj district, Uttar Pradesh, India. *International Health*, 17(1).
- Malhotra, S., Vashist, P., Kalaivani, M., et al. (2022). Prevalence of presbyopia, spectacles coverage and barriers for unmet need among adult population of rural Jhajjar [and extended North Indian cohorts]. *Indian Journal of Ophthalmology/ResearchGate*.
- Mishra, A., et al. (2022). A Study about Prevalence of Refractive Errors and Presbyopia in Northern India. *International Journal of Pharmaceutical and Clinical Research*, 14(9).
- Sah, M. K., Tiwari, P., & Kumar, P. (2025). Patient pushback: Why some resist progressive addition lenses for presbyopia. *Indian Journal of Clinical and Experimental Ophthalmology*, 11(1).
- StatPearls (2025). Presbyopia: Pathophysiology and Management. NCBI Bookshelf. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK560568/>
- World Health Organization (2024). World Report on Vision: Addressing the surge in global demand for eye care.
- Bourne, R. R. A., et al. (2017). Magnitude, temporal trends, and projections of the global prevalence of presbyopia. *Ophthalmology*, 124(10), 1493–1500.
- <https://doi.org/10.1016/j.ophtha.2017.04.013>
- Holden, B. A., et al. (2015). Global prevalence of presbyopia and vision impairment from uncorrected presbyopia. *Ophthalmology*, 122(8), 1506–1515.
- <https://doi.org/10.1016/j.ophtha.2015.04.013>
- Marmamula, S., et al. (2013). Prevalence of presbyopia, spectacle coverage, and barriers to spectacle use. *Investigative Ophthalmology & Visual Science*, 54(10), 6300–6307.
- <https://doi.org/10.1167/iovs.13-12174>
- Patel, I., & West, S. K. (2007). Presbyopia: Prevalence, impact, and interventions. *Community Eye Health*, 20(63), 40–41.
- Pointer, J. S. (1995). The presbyopic add. *Ophthalmic and Physiological Optics*, 15(3), 241–248.
- <https://doi.org/10.1046/j.1475-1313.1995.95000241.x>
- Sherwin, J. C., et al. (2008). The impact of presbyopia on quality of life. *Ophthalmology*, 115(9), 1576–1581.
- <https://doi.org/10.1016/j.ophtha.2008.03.011>