Assessing Visual Outcomes After Senile Cataract Surgery in Urban and Rural Populations of Southern Pakistan.

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ABSTRACT:
Objective: To assess the outcomes of cataract surgery in terms of visual improvement among older adults residing in both urban and rural areas of Southern Pakistan.
Methodology: This cross-sectional observational study was conducted at Institute of Ophthalmology, Liaquat University of Medical & Health Sciences, in Jamshoro during August 2023 to December 2023. 100 patients; 50 from urban and 50 from rural areas were selected through purposive sampling. Visual outcome after cataract surgery was assessed at 15th day, 1 month and 2nd month postoperatively.
Results: After cataract surgery, visual acuity improved in 62% of the urban population and 76% of the rural population by the 15th day after the operation.
Conclusion: The study's findings revealed a notable difference in vision improvement between rural and urban residents after surgery. Specifically, rural residents experienced greater improvement in their vision compared to their urban counterparts. These findings suggest that targeted interventions and tailored healthcare strategies may be necessary to address the unique needs of rural and urban populations and optimize care pathways for patients undergoing cataract surgery.

Key words: Urban, Rural, Cataract, Visual Outcomes, Cross-sectional.

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Introduction:

Cataract is the leading cause of blindness globally, and in Pakistan, it is responsible for about 51.5% of blindness cases, as reported by the National Blindness and Visual Impairment Survey conducted from 2002 to 2003.[1,2] The research indicated that following uncorrected refractive errors (43%), cataract emerged as the primary cause of visual impairment, accounting for 33% of cases.[3] In a study conducted in the urban area of Limbe and the rural area of Muyuka in Cameroon, the prevalence rates of bilateral blindness among individuals aged 40 and older were found to be 1.1% and 1.6%, respectively. Cataract was identified as the leading cause of blindness, contributing to 21% of cases in Limbe and 62.1% in Muyuka.[4-6] Two widely used cataract surgery techniques, phacoemulsification and Manual Small Incision Cataract Surgery (MSICS), have demonstrated high effectiveness with minimal complications. MSICS is especially advantageous for developing nations where advanced cataracts are prevalent. Nevertheless, in Pakistan, a conventional technique known as extracapsular cataract extraction (ECCE) is being practiced widely.[7,8]

In the southern region of Pakistan, individuals residing in rural areas frequently encounter considerable obstacles in obtaining cataract surgery, resulting in different outcomes when compared to those living in urban settings. Rural populations face challenges such as a lack of awareness regarding available treatments, difficulties in traveling to healthcare facilities, and financial constraints, which complicate their ability to receive timely medical attention. This situation underscores the necessity for solutions that tackle these specific barriers and guarantee equitable access to high-quality eye care for everyone.[9,10] When individuals in rural regions are unable to obtain timely care, their vision issues can deteriorate, leading to unsatisfactory results. The problem is often exacerbated by a scarcity of specialized eye care services and qualified doctors in these areas, leaving patients with few choices and less favorable outcomes.[11,12]

Studies show that various factors, including urban versus rural residence, age, and gender, can affect the success rates of cataract surgery. For example, those from urban locales may experience better visual outcomes due to enhanced access to healthcare services and follow-up care.

Objectives:

The study's primary objective was to assess the outcomes of cataract surgery in terms of visual improvement among older adults residing in both urban and rural areas of Southern Pakistan.

Methodology:

The study included 100 patients, evenly divided between urban and rural settings, selected through purposive sampling. This study was conducted at the "Institute of Ophthalmology - Liaquat University of Medical and Health Sci-

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ences, Jamshoro during August 2023 to December 2023. The ethical review committee approved the study, which involved patients diagnosed with senile cataract. Informed written consent was obtained from those who met the inclusion criteria. The best-corrected visual acuity (BCVA) was evaluated for each patient, and surgeries were carried out by a single surgeon per group using phacoemulsification with Intraocular Lens (IOL). Patients who faced complications during the surgery were excluded. Areas with district hospitals were classified as part of the urban population, while the remaining population was categorized as rural. Success was assessed through subjective postoperative visual acuity and best corrected visual acuity (BCVA) at 15 days, 1 month, and 2 months following surgery. Patients of either gender, aged 50 or more with senile cataract were included, while those having associated anterior or posterior segment diseases, complicated cataract and those with mental illness were excluded.

Data analysis was conducted using SPSS version 22, where mean and standard deviation for age were calculated, along with frequencies and percentages for sex and visual acuity. The Best Corrected Visual Acuity (BCVA) was measured and compared pre- and post-operatively in both urban and rural population groups using the Chi-square test.

Results:

The mean age of participants was 63 years with a standard deviation of 11.4 years. Among them, 73% were male, with a mean age of 66 years and a standard deviation of 9.5 years, while 27% were female, averaging 62 years with a standard deviation of 7.9 years. The findings indicated that at the 8-week follow-up visit, 96% of the population had favorable outcomes compared to 88% from the rural population. The study revealed that in urban settings, mature cataracts were the most prevalent type at 42%, followed by hypermature at 16%, cortical at 12%, and posterior subcapsular at 10%.

Table No 1: Age Description of study population

Parameter	Mean Age
Overall Age of Sample	63 ± 11.4 Years
Mean Age of Males	66 ± 9.5 Years
Mean Age of Females	62 ± 7.9 Years

Figure No 1: Types of cataract in rural and urban population.

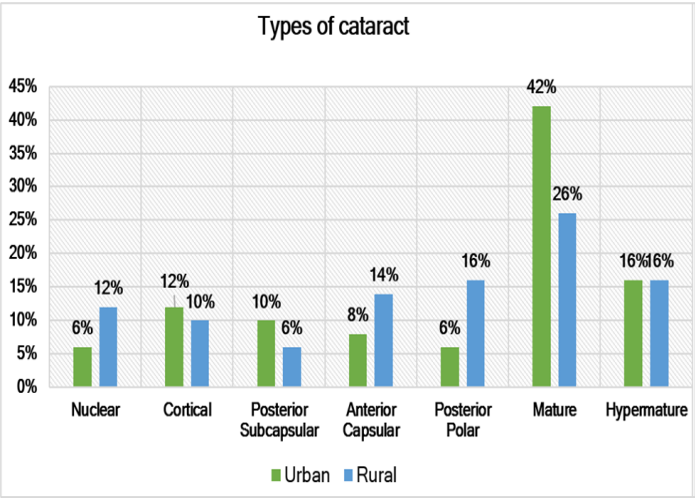

Table No 2: Improvement in Postoperative Visual Acuity.

Follow Up	Rural	Urban
After 15 Days	31 (62 %)	38 (76 %)
After 1 Month	39 (78 %)	43 (86 %)
After 2 Months	44 (88 %)	48 (96 %)

Conversely, rural areas exhibited a higher prevalence of mature cataracts at 26%, followed by nuclear at 18%, hypermature at 16%, and both cortical and posterior polar at 10%. Post-cataract surgery, visual acuity improved for 62% of rural patients and 76% of urban patients by the 15th day. This improvement increased to 78% in rural patients and 86% in urban patients after one month, and further increased to 88% in rural and 96% in urban patients after two months.

Discussion:

Studies have shown that the visual results following cataract surgery tend to be more favorable in urban populations than in rural ones. This difference may stem from a variety of factors, such as lifestyle variations, availability of healthcare, and demographic traits.[13-15] Research conducted in the Framingham eye studies indicates that individuals under 65 years old living in urban areas are two to three times more likely to develop cataracts, whereas those above this age group experience nearly half the incidence compared to their rural counterparts. Luo J attributed these results to variations in lifestyle, access to healthcare, demographic factors, and other pre-existing health conditions.[16-18] Darren A highlighted that there is a notable link between socioeconomic status, healthcare usage, and health outcomes. Individuals with lower socioeconomic status often face greater obstacles in accessing care, leading to worse health outcomes.[19-21]. Urban and rural populations exhibit varying rates of cataract formation and treatment results. Individuals living in cities are more prone to developing cataracts, yet they generally achieve better surgical outcomes. Conversely, those in rural areas frequently present with more severe cataracts, resulting in less favorable outcomes. Factors contributing to these disparities encompass lifestyle choices, healthcare accessibility, demographic variations, and pre-existing health conditions. Individuals with lower incomes are especially impacted, as postponing treatment exacerbates their situation. By recognizing these differences, we can create focused strategies to enhance care for both urban and rural populations.

Conclusion:

The study emphasized the insufficient eye care services accessible to individuals residing in rural regions as opposed to those in urban areas of Pakistan. The study emphasized the insufficient eye care services accessible to individuals residing in rural regions as opposed to those in urban areas of Pakistan. Equitable health care services are essential to bridge the gaps, including prompt cataract surgeries and necessary post-operative care for patients in rural settings. These measures will significantly improve vision outcomes while reducing the unnecessary suffering that individuals endure. Furthermore, the gaps identified in the research necessitate thorough investigation to formulate targeted solutions that will enhance care for the most underserved populations.

Conflict of interest: No conflict of interest declare by any author.

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Authors' Contribution	
Muhammad Raihan Memo	Conceptualization, Study design, Methodology.
Imtiaz Ahmed Gilal	Data interpretation, Critical revisions for intellectual content.
Ghulam Hyder Sahito	Data collection, writing synopsis
Muhammad Ashfaque	Statistical analysis
Prof. Dr. Rajesh Rathi	Oversight of overall project, Final approval of the manuscript.