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FREQUENCY OF LOW VISION CAUSES IN DIFFERENT HOSPITALS OF LAHORE

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ABSTRACT

Background: Low vision significantly impacts daily activities in urban areas like Lahore, Pakistan. Understanding the prevalence and underlying causes of low vision is crucial for developing effective health policies, enhancing service accessibility, and strengthening low-vision rehabilitation efforts.

Objective(s): To assess the frequency and leading cause of low vision in Lahore.

Methodology: This four-month observational cross-sectional study was started at the University of Lahore Teaching Hospital (ULTH) and LRBT, involving 140 patients aged 10 to 60 years diagnosed with low vision. Using a non-probability convenient sampling method, the study ensured ethical compliance by obtaining informed consent and maintaining participant confidentiality. Data collection included comprehensive eye exams (e.g., visual acuity, refraction, slit-lamp, fundoscopy, tonometry, and visual field testing), structured questionnaires, and medical record reviews to assess demographics, medical history, and the impact of low vision on quotidian life. Data was securely recorded and analyzed using SPSS version 27, with descriptive statistics to identify common causes of low vision.

Results: Of the total 140 participants, 71 were female (50.7%) and 69 were male (49.3%). In terms of age, the prime group was those aged 51–60 years (56 participants, 40.0%), followed by the 41–50 year group (29 participants, 20.7%). Among the causes of low vision, Retinitis Pigmentosa was the most common, affecting 33 participants (23.6%), followed by Glaucoma (18 cases, 12.9%) and Cataract (15 cases, 10.7%). ARMD (Age-Related Macular Degeneration) and Diabetic Retinopathy accounted for 11 (7.9%) and 10 (7.1%) cases, respectively. Other notable causes included Myopia (8.6%), Macular Dystrophy (6.4%), Maculopathy (5.7%), Nystagmus (4.3%), Corneal Opacity (3.6%), and Optic Atrophy, which was the least common, affecting only 4 participants (2.9%) and other diseases also include, retinal detachment, macular scar and PVD.

Conclusion(s): This study concluded that retinal disorders, particularly Retinitis Pigmentosa and Glaucoma, are the leading contributors to low vision in this population, with a clear trend of increased prevalence among individuals over 50 years of age.

INTRODUCTION

Low vision is a major public health issue, especially in developing countries like Pakistan, where limited access to eye care services leads to underdiagnosis and undertreatment.[1] It refers to significant visual impairment that cannot be fully corrected with glasses, medication, or surgery, yet still allows for partial sight.[2] In cities like Lahore, low vision is increasingly common due to factors such as uncorrected refractive errors, cataracts, diabetic retinopathy, glaucoma, and age-related conditions.[3] It severely affects daily functioning, quality of life, and independence, often leading to social isolation and depression.[4]

According to global estimates by the WHO, over 2.2 billion people have vision impairment, with 1.1 billion affected by preventable or untreated conditions.[5] In Pakistan alone, around 26.3 million people live with vision loss, including over 700,000 needing low vision rehabilitation.[6],[7] Common causes include uncorrected myopia, presbyopia, and cataracts, many of which remain untreated due to financial constraints and inadequate healthcare infrastructure. The rising prevalence of diabetes has also increased the burden of diabetic retinopathy, making early detection and intervention crucial.[8]

Low vision is an escalating public health issue in Lahore, driven by age-related conditions like macular degeneration and cataracts, chronic diseases such as diabetic retinopathy and glaucoma, genetic disorders like retinitis pigmentosa, uncorrected refractive errors, and traumatic eye injuries.[9] Factors such as limited awareness, delayed diagnosis, and restricted access to eye care, especially in lower-income communities, further contribute to the burden.[10] Environmental and lifestyle influences, including poor nutrition, screen exposure, smoking, and occupational hazards, also play a role in worsening visual impairment.[11]

Despite the availability of advanced eye care, many individuals remain underserved, particularly the elderly and socioeconomically disadvantaged.[12] The growing prevalence of low vision in Lahore highlights the urgent need for early detection, public health education, affordable rehabilitation services, and targeted interventions.[13] This study aims to identify the most common causes of low vision in Lahore, providing data to guide effective healthcare planning, reduce preventable blindness, and improve the quality of life for affected individuals.

Objective

To assess the frequency and leading cause of low vision in Lahore.

Methods

This observational cross-sectional study was conducted over a period of four months at the University of Lahore Teaching Hospital and LRBT Eye Hospital, Multan Road, following the official approval of the research synopsis. A total of 140 participants diagnosed with low vision, aged between 10 and 60 years, were included using a non-probability convenient sampling technique, with a confidence interval of 90%. Both male and female participants were eligible, while individuals unwilling to participate or with mental impairments affecting communication were excluded. Data was collected using a self-structured Performa that captured demographic details, chief complaints, symptom duration, ocular and systemic history, and clinical findings. Written informed consent was obtained from all participants, who were assured of their anonymity, confidentiality, and the right to withdraw at any stage without risk. Data was initially recorded manually and later entered into SPSS version 27 for statistical analysis. Descriptive statistics, including frequencies and percentages, were used to determine the prevalence and common causes of low vision among the study population.

Result

Of the total 140 participants, the gender distribution was nearly equal, with 71 females (50.7%) and 69 males (49.3%), ensuring balanced representation. In terms

of age, the majority of participants were older adults, with the largest group being those aged 51–60 years (56 participants, 40.0%), followed by the 41–50 year group (29 participants, 20.7%), indicating a higher prevalence of low vision in older age groups. Among the causes of low vision, Retinitis Pigmentosa was the most common, affecting 33 participants (23.6%), followed by Glaucoma (18 cases, 12.9%) and Cataract (15 cases, 10.7%). ARMD (Age-Related Macular Degeneration) and Diabetic Retinopathy accounted for 11 (7.9%) and 10 (7.1%) cases, respectively. Other notable causes included Myopia (8.6%), Macular Dystrophy (6.4%), Maculopathy (5.7%), Nystagmus (4.3%), Corneal Opacity (3.6%), and Optic Atrophy, which was the least common, affecting only 4 participants (2.9%)

Table 1: Age Distribution

Age Statistics		
Age	**Frequency**	**Percent (%)**
10-20	28	20.0%
21-30	16	11.4%
31-40	11	7.9%
41-50	29	20.7%
51-60	56	40.0%
Total	140	100.0%

Table 1

The age distribution of the 140 participants indicates that the majority were older adults. The largest age group was 51–60 years, comprising 56 individuals (40.0%), followed by 41–50 years with 29 participants (20.7%). The 10–20 year group included 28 individuals (20.0%), showing a notable number of younger participants as well. Meanwhile, 16 participants (11.4%) fell into the 21–30 year range, and the smallest group was 31–40 years, with 11 individuals (7.9%). This distribution reveals that most cases of low vision in the sample occurred in individuals aged 51 and above, suggesting an age-related trend in visual impairment.

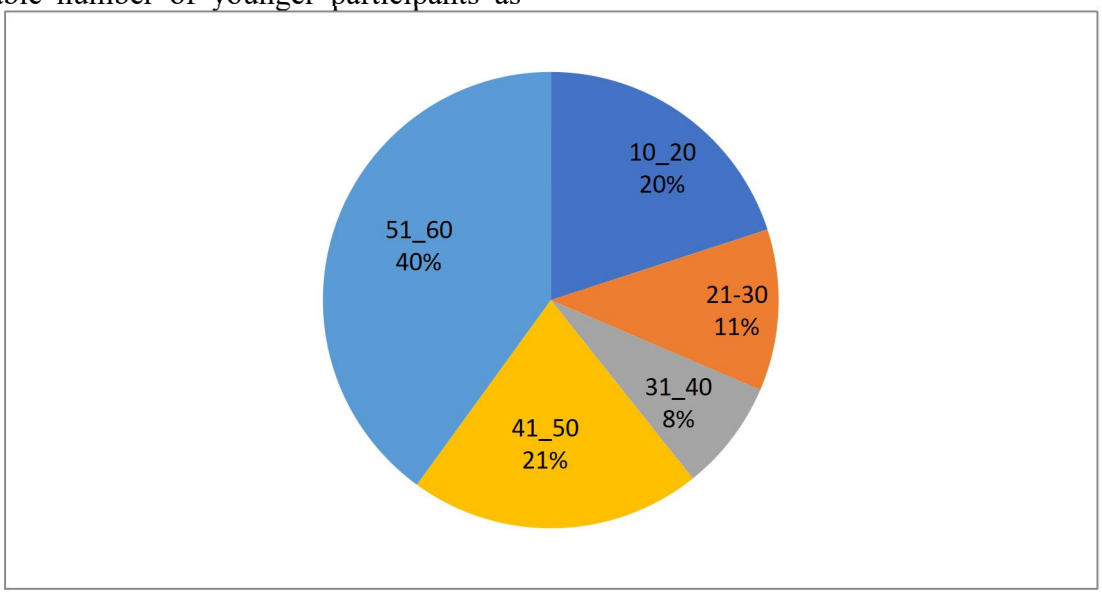

Figure 1: Age Statistics

This pie chart represents the age distribution of the participants, ranging from 10 to 60 years.

Table 2: Gender Distribution

Gender		
	Frequency	**Percent (%)**
Female	71	51.0%
Male	69	49.0%
Total	140	100.0%

Table 2

Out of a total of 140 individuals, 71 were female, representing 51% of the sample, while 69 were male, making up 49%. This indicates a nearly equal gender representation, with only a slight predominance of female participants.

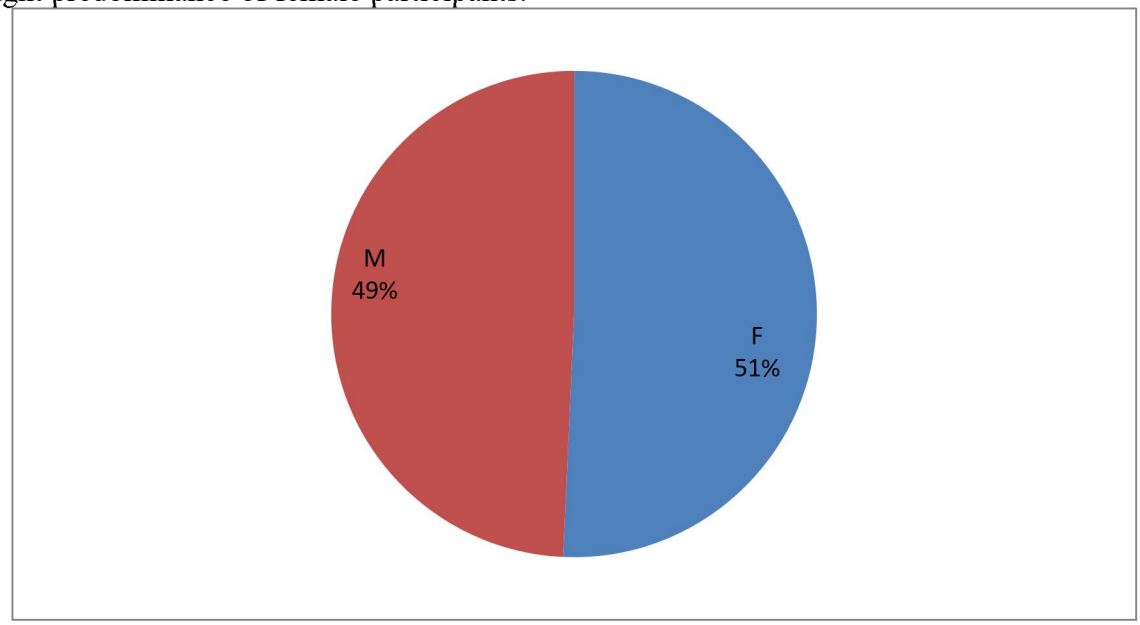

Figure 2: Gender Statistics

This pie chart represents the distribution of gender: Female 51% (Blue) and Male 49% (Red).

Table 3: Causes of Low vision

Causes of Low vision		
	Frequency	**Percent (%)**
Retinitis Pigmentosa	33	23.6%
Myopia	12	8.6%
Glaucoma	18	12.9%
Nystagmus	6	4.3%
DR	10	7.1%
Maculopathy	8	5.7%
AMD	11	7.9%
Cataract	15	10.7%
Macular Dystrophy	9	6.4%
Corneal Opacity	5	3.6%
Optic Atrophy	4	2.9%
Others	9	6.4%

Table 3

The table presents the distribution of various causes of low vision among a sample population. The most prevalent cause is Retinitis Pigmentosa, accounting for 33 cases (23.6%), highlighting its significant contribution to visual impairment. Glaucoma follows with 18 cases (12.9%), while Cataract is responsible for 15 cases (10.7%). Myopia was identified in 12 individuals (8.6%), and Age-related Macular Degeneration (AMD) in 11 cases (7.9%). Diabetic Retinopathy (DR) contributed 10 cases (7.1%), and both Macular Dystrophy and "Other" causes accounted for 9 cases each (6.4%). Maculopathy was found in 8 patients (5.7%), Nystagmus in 6 (4.3%), Corneal Opacity in 5 (3.6%), Optic Atrophy in 4 (2.9%), and other diseases in 9 (6.4%). These findings illustrate that retinal disorders, including Retinitis Pigmentosa, Glaucoma, and AMD, are the leading contributors to low vision, while anterior segment diseases like cataract and corneal opacity also play a notable role.

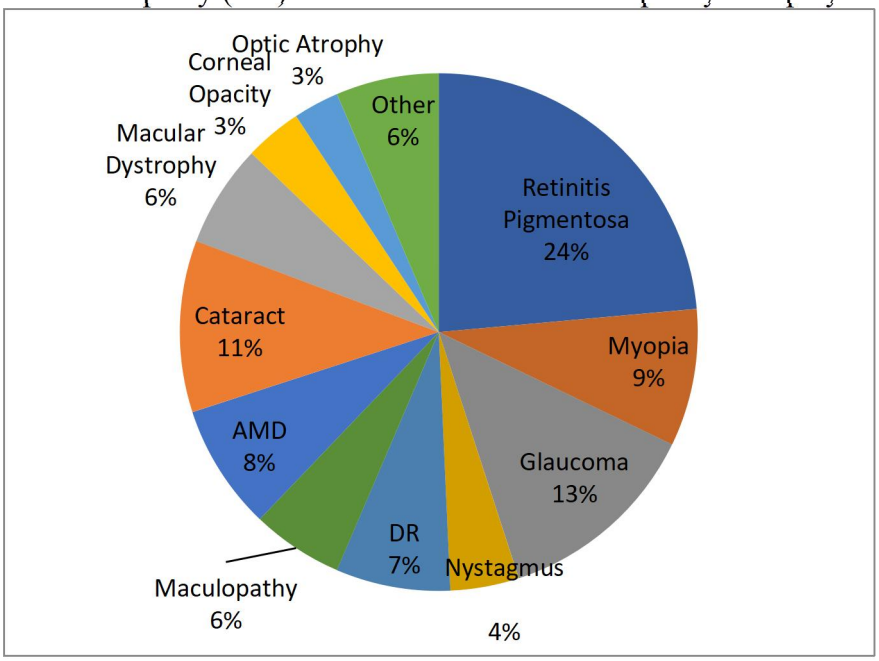

Figure 3: Causes of Low vision

The pie chart illustrates the distribution of various causes of low vision among the study population. Retinitis Pigmentosa is identified as the most common cause, accounting for 24% of all cases. This is followed by Glaucoma (13%), Cataract (11%), and both Myopia and Age-related Macular Degeneration (AMD) at 8% each. Other notable causes include Diabetic Retinopathy (DR) at 7%, Macular Dystrophy and Maculopathy, each contributing 6%, and Nystagmus at 4%. Less frequent conditions include Corneal Opacity (4%) and Optic Atrophy (3%), while the category labeled "Other" comprises 6% of the cases. The chart emphasizes that retinal disorders, particularly Retinitis Pigmentosa, dominate as the leading cause of low vision in this population, underscoring the need for early detection and management of retinal diseases to reduce visual disability.

Discussion

The current study and Fatima Iqbal et al.'s 2019 research at Madinah Teaching Hospital in Faisalabad have identified the leading causes of low vision. Retinitis Pigmentosa is the most prevalent cause, accounting for 23.6% in the current data and 17.5% in the Iqbal et al. study. Glaucoma and Cataract are also among the top three causes, showing similar trends in age-related and chronic ocular conditions contributing to vision loss. However, age-

related Macular Degeneration (ARMD) was notably higher in the current study (7.9%) compared to only 1.3% in the Iqbal et al. study, suggesting a potentially older population or different diagnostic focus in this sample. Diabetic Retinopathy was more prominent in Iqbal et al.'s findings (12.5%) than in the current data (7.1%), which could reflect variations in diabetes prevalence or access to care between the populations. Both studies confirm that retinal diseases and chronic ocular conditions are the primary causes of low vision in Pakistani clinical settings, with some regional variations.[14]

The study by Samia Iqbal et al. at the University of Lahore Teaching Hospital and the current study involving 140 patients both aim to identify the leading causes of visual impairment. Both studies highlight the importance of refractive errors, cataract, eyelid diseases, and squint in causing visual problems. However, the current study identifies retinitis pigmentosa as the leading cause of low vision (23.6%), followed by glaucoma (12.9%) and cataract (10.7%). The study also focuses on complex and chronic visual impairments, such as Age-Related Macular Degeneration (7.9%), maculopathy (5.7%), and diabetic retinopathy (7.1%). The gender distribution in both studies is similar, but the current study has a significantly older population, with the majority of patients aged 51-60 years. Both studies emphasize the need for improved refractive services, cataract management, and basic eye care, especially in rural and underserved populations.[15],[16]

When comparing the results of Muhammad Irfan Wazir et al.'s study with those of the low vision-focused research, clear differences emerge due to the varying scope of each investigation. Wazir's study, steered at DHQ Hospital Bannu, examined the overall frequency of ocular diseases and found that the most common condition was refractive errors (28.2%), followed by cataract (22.1%) and glaucoma (10.0%). In contrast, the low vision study focused specifically on causes of visual impairment and identified retinal disorders as the leading contributors, with Retinitis Pigmentosa being the most prevalent (23.6%), followed by glaucoma (12.9%) and cataract (10.7%). While both studies highlight cataract and glaucoma as common concerns, the low vision study emphasizes degenerative and hereditary retinal diseases such as Retinitis Pigmentosa, Age-Related Macular Degeneration (7.9%), and Diabetic Retinopathy (7.1%), conditions not reported in Wazir's broader analysis. Additionally, both studies observed a higher burden of ocular conditions in older adults, with the most affected age groups being 46–60 years. These findings suggest that while refractive and anterior segment disorders dominate general eye clinic visits, retinal diseases play a more significant role in irreversible vision loss, underlining the need for age-specific screening and early intervention strategies tailored to both functional and vision-threatening eye conditions.[17]

A comparison between the current study and the findings of Pabkota et al. reveals notable differences in the demographic and clinical profiles of low vision patients. While the present study primarily included older adults, with the largest age group being 51–60 years (40%), Pabkota's study at the Nepal Eye Hospital reported a younger patient population, with a mean age of 32.53 years and nearly 68% of patients under 40. Gender distribution was nearly equal in the current study (51% female, 49% male), contrasting with the male predominance (71.5%) observed in Pabkota's study. The leading cause of low vision in the current sample was Retinitis Pigmentosa (23.6%), followed by Glaucoma, Cataract, and Age-Related Macular Degeneration (ARMD), indicating a predominance of retinal and age-related conditions. In contrast, Pabkota identified Nystagmus (30.7%) and high refractive error (22.62%) as the major causes, suggesting a higher prevalence of congenital or developmental issues among younger individuals. Additionally, while Pabkota reported the use of low vision aids, including glasses (78.1%) and telescopes (29.2%), the present study did not document

rehabilitation or device use. These differences highlight the impact of age distribution and clinical setting on the etiology of low vision and underscore the need for age-specific strategies in low vision care and rehabilitation.[18],[19]

A comparison between the current study and the findings of Koc et al. in Izmir, Turkey, highlights both similarities and distinctions in the causes of low vision and blindness across populations. In Koc et al.'s large-scale evaluation of over 20,000 individuals, bilateral low vision and blindness were documented in 347 individuals, with no significant gender disparity, similar to the nearly equal gender distribution observed in our study (51% female, 49% male). Age-stratified analysis in the Izmir population revealed that in younger adults (18–50 years), retinal dystrophies (37%), congenital anomalies (14%), and myopic degeneration (13%) were the leading causes. In contrast, older adults (50+ years) were primarily affected by age-related macular degeneration (21%), followed by diabetic retinopathy, corneal opacities, cataract, and glaucoma. In our study, Retinitis Pigmentosa (23.6%) was the most common overall cause, with other significant contributors including glaucoma, cataract, ARMD, and diabetic retinopathy. Both studies underscore the dominance of retinal disorders as a key cause of visual impairment, particularly in working-age and older adults. However, while Koc et al. observed a shift from hereditary conditions in younger populations to age-related and systemic causes in older age groups, our study identified Retinitis Pigmentosa as the leading cause across all ages, suggesting a strong genetic or hereditary component in our sample population. This comparison emphasizes the need for population-specific strategies, with a focus on retinal disease management and early intervention, particularly in genetically predisposed groups.[20]

Conclusion

The study concluded that retinal disorders, particularly Retinitis Pigmentosa and Glaucoma, are the leading contributors to low vision in this population, with a clear trend of increased prevalence among individuals over 50 years of age. The findings underscore the importance of early screening and targeted interventions for age-related and hereditary retinal conditions to reduce the burden of low vision.

Limitations

There was a small sample size, which restricts how broadly the results may be applied on the general population.

This study was conducted in a short duration and specific time interval and it was a cross-sectional study.

Low vision patient not visiting hospital.

Recommendations

Long-duration cohort studies may further enhance the strength of results.

Inclusion of a larger age group, especially children, may further strengthen our results.

Screening seminars should be arranged for the awareness of disease causing low vision.

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