

EFFECTIVENESS OF LOW VISION AIDS AS REHABILITATIVE SERVICES GIVEN TO LOW VISION PATIENTS AT KHYBER TEACHING HOSPITAL, PESHAWAR, PAKISTAN

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How to cite this article

Junaid N, Khalil KUR, Bilal S, Akber F, Khan MD. Effectiveness of Low Vision Aids as Rehabilitative Services Given to Low Vision Patients at Khyber Teaching Hospital, Peshawar, Pakistan. J Gandhara Med Dent Sci. 2026;13(4): 85-89.
http://doi.org/10.37762/jgmds.13-4.979

Date Submission: 03-08-2026

Date Revised: 10-09-2026

Date Acceptance: 14-09-2026

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INTRODUCTION

Visual impairment and disability are important public health issues. Visual impairment is a decreased ability to see to an extent that causes problems that cannot be fixed by conventional methods such as wearing glasses or using medication.¹ It is the limitation of the actions or functions of the visual system, which can include loss of visual acuity or visual field, perceptual difficulties, diplopia, photophobia, or a combination of the above. The major causes of visual impairment include: uncorrected refractive error, cataract, retinal degeneration, glaucoma, diabetic neuropathy, corneal opacity, neurological disorders.² The WHO characterizes levels of visual debilitation based on visual acuity or potential visual field restriction, and defines visual impairment as a significant hindrance (this can refer to visual deficiency in one eye or impairment in the individual).³ The WHO defines visual impairment as visual acuity under 20/400 and a visual field of less than 10 degrees in the better eye. Visual sharpness of 20/70 to

ABSTRACT

OBJECTIVES

This study aims to determine the effectiveness of various low vision aids provided to low vision patients and to observe their impact on quality of life.

METHODOLOGY

A cross-sectional study was conducted to collect data from low vision patients visiting the Eye OPD, Khyber Teaching Hospital, Peshawar, using a well-structured questionnaire. We estimated a total sample size of 100 using a formula and collected data through non-probability convenience sampling. Informed consent was obtained. We analyzed the data using SPSS version 20.

RESULTS

Of the 100 participants, 74% were male, and 26% were female. 36% of participants were aged 5-15 years, whereas 64% were 16-80 years old. 98% already used low vision aids, and 2% did not. Of these, 66% used telescopes, 16% used magnifiers, and 18% used both. After the use of low vision aids, 40% of participants had a visual acuity in the range of 6/6 and 6/9, 24% had between 6/18 and 6/12, 21% between 6/24 and 6/18, 11% had between 6/60 and 6/36, 3% had between 1/60 and 3/60 and 1% between 4/60 and 5/60. Of 100 participants, 51% had average effectiveness, 38% poor effectiveness, and 11% excellent effectiveness. Participants' quality of life improved significantly. 40% of participants had slightly improved quality of life, 38% had moderately improved quality of life, and 22% had significantly improved quality of life.

CONCLUSION

Use of low vision aids has significantly improved vision and quality of life in low vision patients. The dependency on others to perform various daily tasks has greatly decreased for a vast majority of patients. Hence, our study concludes that low vision aids have proved to be really effective as a visual rehabilitative service for low vision patients.

KEYWORDS: Low Vision Aids, Visual Acuity, Quality of Life

20/400 (comprehensive) is viewed as moderate visual disability or low vision.⁴ According to WHO, 191-285 million people worldwide have vision impairment, 39 million blind and 246 million with low vision. About 80 million people worldwide need low vision care. Of these, 6 million are children, 4.8 million of whom live in low- and middle-income countries.⁵ According to research, an estimated 727,00 adults in Pakistan have functional low vision. The standardized prevalence of functional low vision and total blindness is 1.7% and 0.2%, respectively. Globally and in Pakistan, management of visually impaired individuals has largely been focused on rehabilitation through assistive technologies, training, rehabilitation services and education.⁶ Visual rehabilitation aims to restore functional ability and improve quality of life after vision loss. Visual rehabilitation services include Visual Assessment, in which a low-vision eye exam is done to check residual function.⁷ Providers may prescribe eyeglasses and other visual aids, such as magnifiers, telescopes, and filters. Visual skill training in which eyes are trained to use visual aids and strategies.^{8,9} Environmental Adaptation

includes lighting recommendations, contrast enhancements, labeling, organization, and glare-reduction techniques.¹⁰ Adaptive communication techniques include Braille, computer and handwriting, listening and recording techniques, low vision technology, and math and keyboarding. Low vision aids include magnifiers, reading spectacles, telescopes, glare-control devices, and enlarged products.¹¹ Home skills training includes communication skills, self-care skills, personal management, socialization skills, vocational training, education, and recreation activities.¹² The present study is very helpful as it will assess the effect of low vision aid devices and their impact on the quality of life of visually impaired people.

METHODOLOGY

A cross-sectional descriptive study was carried out from January 2024 to April 2025 at the Eye OPD, Khyber Teaching Hospital, Peshawar. Data were collected after ethical approval (Ref No. 819/DME/KMC, dated 27-09-2023) from the Ethics Committee of Khyber Medical College, Peshawar. Before data collection, we informed patients about the study and obtained consent. We then used a well-structured proforma to gather information on the underlying cause of low vision and the performance of daily activities such as reading a newspaper or mail, watching television, recognizing people, signing documents, driving, walking up stairs, etc., after using low-vision aids to assess their effectiveness. Simultaneously, visual acuity tests were also performed using a Snellen eye chart. We calculated a sample size of approximately 100 using OpenEpi online software, with a 95% confidence interval, a 5% margin of error, and an anticipated frequency of low vision of 7% from a previous study. The present study included children and adults aged 5 to 60 years. We collected data using a structured proforma and used a Snellen chart to measure visual acuity. Data were analyzed using SPSS version 26 for Windows. Quantitative variables were summarized as mean $\pm$ SD, and qualitative variables were presented as percentages and frequencies. All data were presented in tables and graphs.

RESULTS

A total of 100 participants were included in the study. Of these, 36 (36%) were children aged 5–15 years and 64 (64%) were adults aged 16–60 years. Most participants, 98 (98%), reported using a low-vision aid, whereas 2 (2%) did not use any low-vision aid. Among the 100 participants, telescopes were the most frequently used low-vision aid, reported by 66 (66%) participants. Magnifiers alone were used by 16 (16%), while 18 (18%) participants used both a telescope and a magnifier (Figure 1).

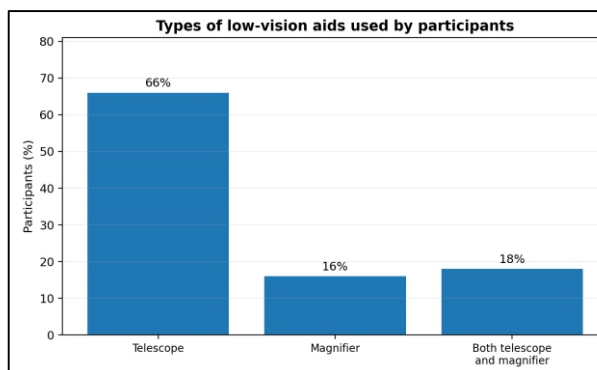


Figure 1: Distribution of Low-Vision Aids Used by Study Participants (N=100)

Before using low-vision aids, the largest proportion of participants, 64 (64%), had visual acuity between 6/60 and 6/36. Ten (10%) participants had visual acuity between 1/60 and 3/60, 11 (11%) between 4/60 and 5/60, and 13 (13%) between 6/24 and 6/18. Only 2 (2%) participants had visual acuity between 6/18 and 6/12 (Figure 2).

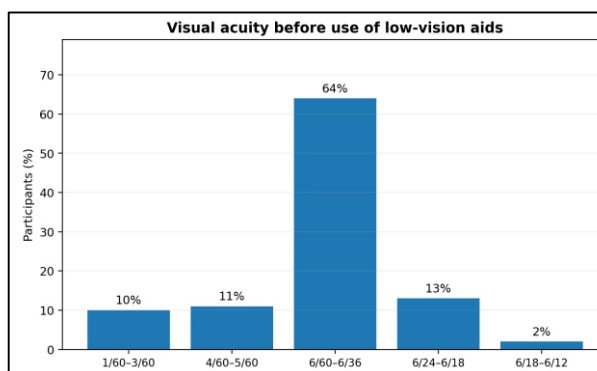


Figure 2: Distribution of Visual-Acuity Categories before Use of Low-Vision Aids (n=100)

Following use of low-vision aids, visual acuity shifted toward better acuity categories. Forty (40%) participants achieved visual acuity between 6/9 and 6/6, 24 (24%) were between 6/18 and 6/12, and 21 (21%) were between 6/24 and 6/18. The remaining 15 (15%) participants were reported in lower visual-acuity categories; however, the available data did not provide a further breakdown of these participants (Figure 3).

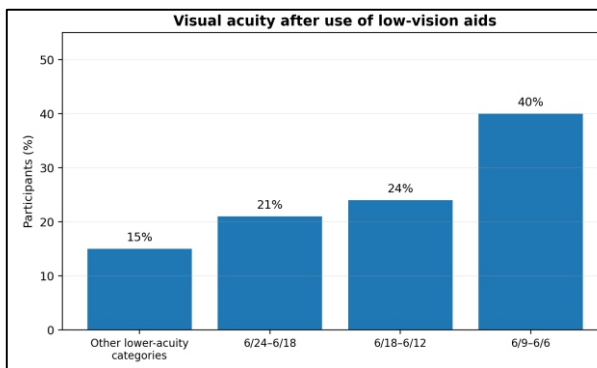


Figure 3: Distribution of Visual-Acuity Categories after Use of Low-Vision Aids (n=100)

The mean coded visual-acuity score increased from 2.86 ± 0.84 before use of a low-vision aid to 4.82 ± 1.27 after use. The reported two-tailed significance value was <0.001 , indicating a statistically significant improvement in visual acuity following use of low-vision aids (Table 1). Because the available output provides only the coded means, standard deviations, standard errors, and p-value, the corresponding test statistic and confidence interval are not reported here.

Table 1: Comparison of Coded Visual-Acuity Scores Before and After Use of Low-Vision Aids.

Visual-acuity assessment	Mean	N	SD	SE	p-value
Without low-vision aid	2.86	100	0.841	0.084	
With low-vision aid	4.82	100	1.266	0.127	<0.001

Note: The p-value is reported as $p < 0.001$ rather than $p = 0.000$. The analysis should be identified in the Methods as a paired-samples test if the same participants were assessed before and after the intervention.

Based on the study's effectiveness grading, 51 (51%) participants rated the effectiveness of low-vision aids as average, 38 (38%) as poor, and 11 (11%) as excellent (Figure 4).

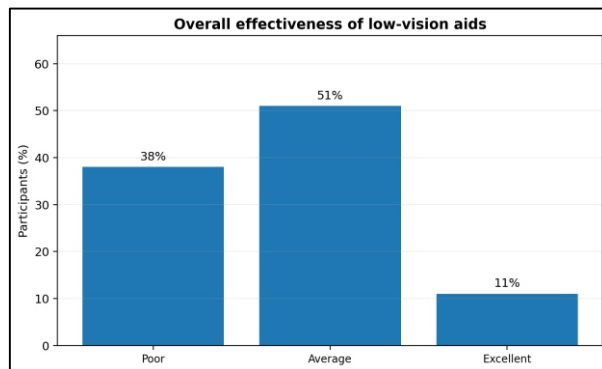


Figure 4. Participant-Rated Effectiveness of Low-Vision Aids (n=100).

Participants also reported improvement in quality of life after using low-vision aids. Forty (40%) participants reported slight improvement, 38 (38%) reported moderate improvement, and 22 (22%) reported significant improvement (Figure 5). Thus, all participants reported at least some improvement in quality of life, although the degree of improvement varied across participants.

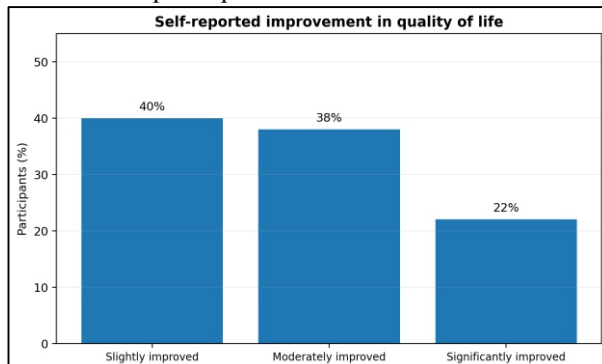


Figure 5: Reported Improvement in Quality of Life Following Use of Low-Vision Aids (n=100)

DISCUSSION

The present study showed that visual acuity significantly improved with the use of visual aids in both children and adults. The quality of life of about 38% of participants improved moderately, while 22% showed significant improvement. International studies on the effects of low vision aids also showed benefits. A study by Erginturk Acar showed that patients with low vision due to macular degeneration had a statistically significant increase in overall vision, distance activities, and social functioning. In the rehabilitation group, statistically significant increases were found in the overall composite score, and general vision, near and distance activities, social functioning, mental health, role difficulties, and dependency subscale scores of the NEI-VFQ-25 quality of life scale after low vision rehabilitation ($p = 0.009$ for general vision, $p < 0.001$ for others). Overall quality of life improved significantly.¹³ Our results align with the cited study and showed that quality of life greatly improved after using low vision aids. Interventional studies also evaluated the effectiveness of low vision aids. A non-randomized controlled trial by Nisha et al. showed that the intervention group had significant improvement in vision-related quality of life, including daily tasks. The use of LVAs improved reading and near visual acuity by 3.57 ± 1.76 and 2.25 ± 2.79 lines, respectively. The percentage of patients able to read font size 2 increased from 2.7% to 53.0% after using near vision aids. The results showed that low vision aids can be a good option, but compliance with the aid is a necessary factor.¹⁴ Our findings showed that quality of life improves with aid use, but this cross-sectional study only shows a baseline association. A study from Nigeria showed that visual aid use in rehabilitation of visually impaired patients improved outcomes among those with good compliance. Compared with children, adults showed significant improvement.¹⁵ The use of LVAs improved reading and near visual acuity by 3.57 ± 1.76 and 2.25 ± 2.79 lines, respectively. The percentage of patients able to read font size 2 increased from 2.7% to 53.0% after using near vision aids. In the present study, age was not significantly associated with quality-of-life improvement. A cross-sectional study from Saudi Arabia evaluated the quality of life of patients previously diagnosed with keratoconus. The participants reported significant improvement after using low vision aids.¹⁶ Our study showed mixed improvement with low vision aids. Various studies in Pakistan have examined the importance of visual aids in visually impaired patients. A study by Fatima Zahid showed significant improvement in patients' mobility after using visual aids. The most common devices used in this study were

magnifiers(38.5%).¹⁷ Our study found that 16% of patients used magnifiers. Another study by Ansa et al. showed that 51.8% preferred telescopes for low vision Aids. Visual acuity improved significantly (p -value < 0.05) after using low vision Aids¹⁸. In our study, telescopes and magnifiers were the preferred devices. Similarly, visual acuity improved after using low vision aids. Regarding awareness of low vision aids, a study by Sharqa et al. showed that 58.8% of patients had poor awareness of low vision aid devices. Those already using devices showed beneficial effects, as reflected in improved quality of life.¹⁹ Similarly, our study also found a lack of awareness about devices, and those who used them showed improved quality of life. Numerous other studies in Pakistan showed that the patient's quality of life significantly improved with the use of low vision devices. These studies, including the present study, provide strong evidence that these devices are effective. The main reasons for not using them are their cost and lack of awareness.^{20,21,22} The present study has limitations, including a small sample size and a single-center design. This topic can be further extended to assess patients' barriers and knowledge regarding the use of low vision aids.

LIMITATIONS

This study has several limitations. The relatively small sample size and single-center design may limit the generalizability of the findings to the wider low-vision population. The use of non-probability convenience sampling may have introduced selection bias. Furthermore, the cross-sectional design and absence of a control or comparison group limit the ability to establish a causal relationship between the use of low-vision aids and improvements in visual acuity or quality of life. Quality-of-life improvement was based on participant-reported responses rather than a validated standardized quality-of-life instrument. Future multicenter studies with larger samples, standardized assessment tools, longer follow-up, and appropriate comparison groups are recommended to confirm these findings.

CONCLUSIONS

Low vision aids are significantly effective in improving vision and the social life of low vision patients. Our results indicate that patients' visual acuity improved substantially with these aids as a rehabilitative measure. Moreover, we assessed these patients' quality of life after they were prescribed and used low vision aids. We can successfully conclude that the inclusion of aids has positively affected them socially and physically by decreasing their dependency on others and mentally rendering them free from depression and frustration that

came with not being able to do their daily tasks on their own. These patients' working efficacy has improved tremendously after use. Furthermore, almost all patients recommended using low vision aids.

CONFLICT OF INTEREST: None

FUNDING SOURCES: None

REFERENCES

1. Perrault MA, Lauer G, Voss S, Seitz B, Käsmann-Kellner B. Visual impairment and low vision aids—a comparison between children and adults. *J Pers Med.* 2023;13(11):1608. doi:10.3390/jpm13111608. PMID: 38003923.
2. Kafle N, Adhikari S, Kar A. Disorders encountered low vision. *Acta Sci Ophthalmol.* 2023;6(2):40-46. doi:10.31080/ASOP.2023.06.0618.
3. Prasad S. Innovative assistive technologies for enhancing daily living in individuals with low vision. *Int J Adv Acad Stud.* 2024;6(12):10-12. doi:10.33545/27068919.2024.v6.i12a.1307.
4. Singh K, Singh A, Chaudury P, Jain D. Efficacy of low-vision devices in elderly population with age-related macular degeneration. *Indian J Ophthalmol.* 2023;71(7):2808-2811. doi:10.4103/IJO.IJO_72_23. PMID: 37417125.
5. Akuffo KO, Kyeremeh S, Agyekum S, Osei Duah Junior I, Ampong J, Okine M, et al. Low vision services in sub-Saharan Africa: a systematic review. *Front Health Serv.* 2026;6:1839924. doi:10.3389/frhs.2026.1839924. PMID: 42318162.
6. Apostoae MG, Baritz M, Repanovici A, Barbu DM, Lazăr AM, Bodi G. Visual aid systems from smart city to improve the life of people with low vision. *Sustainability.* 2023;15(8):6852. doi:10.3390/su15086852.
7. Odjimogho SE, Chibuzo NV, Odjimogho SE, Gabriel BO. Assessment of the quality of life of low-vision patients in Benin-City, Edo-State. *Afr Multidiscip J Sci Artif Intell.* 2025;2(2):112-125. doi:10.58578/amjsai.v2i2.5137.
8. van Nispen RMA, Virgili G, Hoebe M, Langelaan M, Klevering J, Keunen JEE, et al. Low vision rehabilitation for better quality of life in visually impaired adults. *Cochrane Database Syst Rev.* 2020;1(1). doi:10.1002/14651858.CD006543.pub2. PMID: 31985055.
9. Tu C, Ni L, Jiang L, Zhang X. Low vision aids to improve the quality of life in low vision patients. *Chin J Optom Ophthalmol Vis Sci.* 2019;21(6):460-463. doi:10.3760/cma.j.issn.1674-845X.2019.06.010.
10. Fereydouni F, Tabatabaee S. Can low vision aids improve the quality of life of low vision patients? *J Eye Dis Disord.* 2018;3:122.
11. Nazar MZ, Rana Z, Babur N, Mahmood K, Bilal MT. The impact of assistive technology on quality of life in individuals with low vision: a systematic review. *Am J Biomed Sci Res.* 2025;27(6):903-905. doi:10.34297/AJBSR.2025.27.003612.
12. Asimadu IN, Okeke S, Onyebueke GC. Vision-related quality of life amongst patients with low vision and blindness in a resource-limited country. *Int Ophthalmol.* 2023;43(4):1291-1302. doi:10.1007/s10792-022-02527-8. PMID: 36175783.
13. Acar DE, Batoğlu F, Idil A, Şahlı E, Goksuluk D. Rehabilitation methods for patients with geographic atrophy due to age-related macular degeneration and effects of rehabilitation on quality of life. *J Ophthalmol.* 2023;2023:3389750. doi:10.1155/2023/3389750. PMID: 37455795.
14. Yadav N, Rawat BS, Saini SK, Raj S, Pandav SS, Duggal M. Vision beyond sight—low-vision services for quality of life and functional independence: a non-randomized clinical trial. *Br J Vis Impair.* 2026 Jan 19. doi:10.1177/02646196251382490

15. Ejiafor I, Achigbu E, Onyia O, Edema O, Florence NU. Impact of visual impairment and blindness on quality of life of patients in Owerri, Imo State, Nigeria. Middle East Afr J Ophthalmol. 2019;26(3):127-132. doi:10.4103/meajo.MEAJO_256_18. PMID: 31619898.
16. Al-Dairi W, Al Dehailan AM, Alhammadi Y, Aljohar HI, Alhadi FA, Alhaboob ZA, et al. Vision-related quality of life in patients with keratoconus: a nationwide study in Saudi Arabia. Cureus. 2023;15(2). doi:10.7759/cureus.35178. PMID: 36960261.
17. Zahid F, Lal DM. Influence of low vision assistive technology on mobility among visually impaired individuals. J Health Wellness Community Res. 2025;3(10). doi:10.61919/wrykf60.
18. Benazir A, Gul N, Syed K, Farwa U, Ahmad S. Enhancing vision: evaluating the effectiveness of telescopic devices in individuals with retinitis pigmentosa. Pak J Ophthalmol. 2025;41(1):4-11. doi:10.36351/pjo.v41i1.1900.
19. Fatima S, Tanveer M, Ayub F, Sohail W, Batool Z. Awareness, utilization and barriers in accessing assistive technology among patients attending low vision rehabilitation center. Pak J Med Health Sci. 2024;18(7):21-25. doi:10.53350/pjmhs020241874.
20. Abdul Aziz A, Kulkarni U. Effectiveness of low vision aids in patients with low vision attending a medical college hospital. Trop J Ophthalmol Otolaryngol. 2020;5(4):88-95. doi:10.17511/jooo.2020.i04.02.
21. Bashir MS, Shaukat T, Sunny S, Kaxmi SZ, Khokhar GS, Javeed T. Comparison of vision-related quality of life and mental health in congenital versus acquired low vision patients. Insights J Health Rehabil. 2025;3(5):220-226. doi:10.71000/ve0tzj41.
22. Jabbar M, Asghar SS, Gillani SS, Saeed M, Akram Z, Jabbar K. Comparative analysis of quality of life questionnaires in low vision patients. Pak J Health Sci. 2023;4(6):258-262. doi:10.54393/pjhs.v4i06.879.

AUTHORS CONTRIBUTION

Natasha Junaid - Concept & Design; Data Acquisition; Data Analysis/Interpretation; Critical Revision; Supervision; Final Approval

Kashif Ur Rehman - Concept & Design; Data Analysis/Interpretation; Drafting Manuscript; Final Approval

Sadaf Bilal - Concept & Design; Data Acquisition; Critical Revision; Final Approval

Faiza Akber - Concept & Design; Data Analysis/Interpretation; Critical Revision; Final Approval

Muhammad Dawood Khan - Concept & Design; Data Acquisition; Data Analysis/Interpretation; Critical Revision; Final Approval

The authors accept responsibility for all aspects of the work and will ensure that any concerns regarding the accuracy or integrity of any part are properly investigated and resolved.



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