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Psychological Outcomes of Long-Term Low Vision Rehabilitation in Elderly Patients with Age-Related Ocular Diseases

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*Corresponding author: Dr. Sailesh Kumar, Department of Ophthalmology, Era University, India Email: sk28994gmail.com DOI: 10.62502/nemj/v1i1art8 Received: 10/04/2025 Accepted: 29/07/2025 Published: 20/09/2025 Copyright © 2025. The Author (s) This is an open-access article distributed under the terms of the Creative Commons Attribution, Non-Commercial-4.0 International License (CC BY-NC-4.0), which permits non-commercial use, sharing, adaptation, and reproduction in any medium, provided the original work is properly cited and any derivative works are distributed under the same license.	ABSTRACT Background: Low vision rehabilitation (LVR) aims to improve functional independence in elderly individuals with irreversible age-related ocular diseases. Psychological adaptation, however, may require long-term intervention. Objective: To evaluate psychological outcomes of long-term LVR in elderly patients with age-related visual impairment. Methods: A prospective longitudinal observational study was conducted at a tertiary low vision rehabilitation center. Seventy-two patients aged ≥ 60 years with irreversible visual impairment were assessed at baseline and after long-term rehabilitation using Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), vision-related self-efficacy instruments, and NEI VFQ-25. Results: Significant reductions were observed in depression (GDS: 9.8 ± 3.1 to 6.4 ± 2.7, $p < 0.001$) and anxiety (HADS-A: 10.2 ± 2.8 to 7.1 ± 2.4, $p < 0.001$). Self-efficacy and vision-related quality of life improved significantly ($p < 0.001$). Longer rehabilitation duration correlated with greater psychological gains. Conclusion: Long-term LVR improves psychological wellbeing, self-efficacy, and quality of life in elderly patients, supporting the need for sustained rehabilitation services. Keywords: Low vision rehabilitation, Psychological outcomes, Age-related ocular disease
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INTRODUCTION

Age-related ocular diseases are a major cause of visual impairment among the elderly and represent a growing global public health challenge. Conditions such as age-related macular degeneration (AMD), glaucoma, diabetic retinopathy, and cataract-related sequelae account for a substantial proportion of irreversible vision loss in older adults, significantly affecting functional ability and independence. ^[1,2] With increasing life expectancy worldwide, the prevalence of chronic visual impairment in the aging population is expected to rise, intensifying its clinical, social, and psychological consequences. ^[3] Low vision is increasingly recognized as a multidimensional health condition that extends beyond sensory deficits. Elderly individuals with visual impairment frequently experience difficulties in activities of daily living, reduced mobility, impaired social participation, and loss of autonomy. ^[4] These functional limitations are strongly associated with adverse psychological outcomes, including depression, anxiety, emotional distress, and social isolation. ^[5] Epidemiological studies have demonstrated that older adults with visual impairment have a significantly higher prevalence of depressive symptoms compared with those without vision loss, highlighting the close interaction between visual disability and mental health. ^[6] Low vision rehabilitation (LVR) plays a critical role in the management of irreversible visual impairment. LVR programs typically involve a multidisciplinary approach, incorporating optical and non-optical assistive devices, environmental modification, orientation and mobility training, visual skills enhancement, and patient education. ^[7]

While the primary objective of LVR is to optimize residual vision and functional independence, its potential benefits extend to psychological adaptation by enhancing self-efficacy, autonomy, and coping strategies. [8] Short-term studies have consistently reported improvements in functional performance and quality of life following low vision rehabilitation. [9,10] However, psychological adjustment to vision loss is often a prolonged process, particularly in elderly patients who may simultaneously face age-related physical decline, multiple comorbidities, and reduced social support. Consequently, long-term rehabilitation may be essential not only for sustaining functional gains but also for reducing emotional distress and promoting psychological resilience. [11] Despite this, evidence on the long-term psychological outcomes of LVR remains limited, with many studies characterized by short follow-up periods and heterogeneous outcome measures. [12]

Age-related ocular diseases pose distinct psychological challenges due to their progressive and often unpredictable nature. Progressive conditions such as AMD and glaucoma require continuous adaptation, frequently accompanied by fear of further vision deterioration, loss of confidence, and increasing dependence on caregivers [13] These factors may contribute to persistent anxiety and depressive symptoms if not adequately addressed within rehabilitation frameworks. Understanding the psychological impact of long-term engagement in low vision rehabilitation is therefore of considerable clinical importance. Psychological wellbeing is also increasingly recognized as a determinant of rehabilitation success. Depression and anxiety can negatively influence motivation, learning capacity, and adherence to rehabilitation strategies, ultimately limiting functional outcomes [14] Conversely, improved psychological health may enhance participation in rehabilitation, encourage sustained use of assistive devices, and support long-term independence. Integrating psychological outcome assessment into low vision rehabilitation research aligns with patient-centered care models and holistic approaches to disability management [15]

Given the increasing burden of age-related visual impairment and its psychological consequences, there is a clear need for robust evidence evaluating the long-term psychological effects of low vision rehabilitation in elderly populations. Such evidence is essential to inform clinical practice, guide rehabilitation program development, and support the integration of psychological support within standard low vision services. Therefore, the present study aims to assess the psychological outcomes of long-term low vision rehabilitation in elderly patients with age-related ocular diseases.

AIM AND OBJECTIVE

Aim: The aim of this study is to evaluate the psychological outcomes of long-term low vision rehabilitation in elderly patients with age-related ocular diseases.

Objectives

1. To assess changes in psychological wellbeing, including levels of depression and anxiety, in elderly patients undergoing long-term low vision rehabilitation.
2. To evaluate the impact of sustained low vision rehabilitation on self-efficacy, emotional adjustment, and coping with visual impairment.
3. To examine the association between duration of low vision rehabilitation and psychological outcomes in elderly patients with age-related ocular diseases.
4. To determine the influence of long-term low vision rehabilitation on vision-related quality of life and social participation.

METHODS AND METHODOLOGY

Study Design: A prospective longitudinal observational approach was adopted to examine the psychological effects of sustained low vision rehabilitation (LVR) in elderly individuals with age-related ocular disorders. Psychological status and vision-related outcomes were evaluated at two time points: prior to initiation of rehabilitation and following prolonged participation in a structured rehabilitation program.

Study Setting: The study was carried out at a tertiary-level eye care institution with a dedicated low vision rehabilitation unit. The center provides comprehensive rehabilitation services, including optical and non-optical interventions, orientation and mobility training, and patient-centered counseling. Rehabilitation was delivered by a multidisciplinary team consisting of ophthalmologists, optometrists, low vision rehabilitation therapists, and allied rehabilitation professionals.

Study Population: Participants included adults aged 60 years and older with permanent visual impairment resulting from age-related ocular conditions. Diagnoses encompassed age-related macular degeneration, glaucoma, diabetic retinopathy, and other chronic retinal or optic nerve pathologies associated with irreversible vision loss.

Inclusion Criteria

- Age 60 years or above
- Documented irreversible visual impairment attributable to an age-related ocular disease
- Best-corrected visual acuity poorer than 6/18 in the better eye and/or clinically significant visual field impairment

- Enrollment in a formal low vision rehabilitation program
- Ability to provide informed consent and reliably complete psychological assessments

Exclusion Criteria

- Ocular conditions with potential for visual recovery following medical or surgical intervention
- Presence of severe cognitive deficits or diagnosed psychiatric disorders affecting assessment reliability
- Significant hearing impairment that could compromise questionnaire administration
- Participation in structured low vision rehabilitation within the preceding 12 months

Low Vision Rehabilitation Intervention: All participants received individualized low vision rehabilitation based on functional needs identified during initial assessment. Interventions included prescription and training in the use of optical low vision aids such as magnifiers and telescopes, as well as non-optical strategies including lighting optimization and contrast enhancement. Orientation and mobility training and instruction in activities of daily living were integral components of the program. Educational and counseling sessions focused on psychological adjustment, coping with vision loss, and effective utilization of assistive devices. Rehabilitation was delivered over an extended period, with periodic follow-up visits to reinforce skills and modify interventions as required.

Outcome Measures: Psychological outcomes were evaluated using standardized and validated assessment tools administered at baseline and during long-term follow-up.

- **Depression and Anxiety:** Assessed using the Geriatric Depression Scale (GDS) and the Hospital Anxiety and Depression Scale (HADS), both validated for use in elderly and visually impaired populations.
- **Self-Efficacy and Emotional Adjustment:** Evaluated through vision-specific self-efficacy instruments and adjustment-to-vision-loss scales designed to measure emotional adaptation and coping.
- **Vision-Related Quality of Life:** Measured using a validated vision-specific quality-of-life questionnaire, such as the National Eye Institute Visual Function Questionnaire (NEI VFQ-25).

Data Collection Procedure: Baseline data were collected prior to commencement of low vision rehabilitation. Follow-up psychological assessments were performed after prolonged engagement in the rehabilitation program, with the minimum duration defined by the study protocol. Demographic

characteristics, clinical diagnosis, duration of visual impairment, and details of rehabilitation interventions were documented using a standardized data collection form.

Statistical Analysis: Statistical analysis was performed using appropriate analytical software. Descriptive statistics were used to summarize demographic and clinical variables. Differences in psychological and quality-of-life outcomes between baseline and follow-up assessments were analyzed using paired statistical tests. Correlation and regression analyses were applied to explore associations between rehabilitation duration and psychological outcomes. Statistical significance was defined as a p-value less than 0.05.

RESULTS

Participant Characteristics: A total of 72 elderly patients completed baseline and long-term follow-up assessments and were included in the final analysis. The mean age of participants was 68.4 ± 6.3 years, with a higher proportion of males (56.9%) compared to females (43.1%). The most common primary ocular diagnosis was age-related macular degeneration (38.9%), followed by glaucoma (27.8%) and diabetic retinopathy (22.2%). Other age-related retinal or optic nerve disorders accounted for 11.1% of cases.

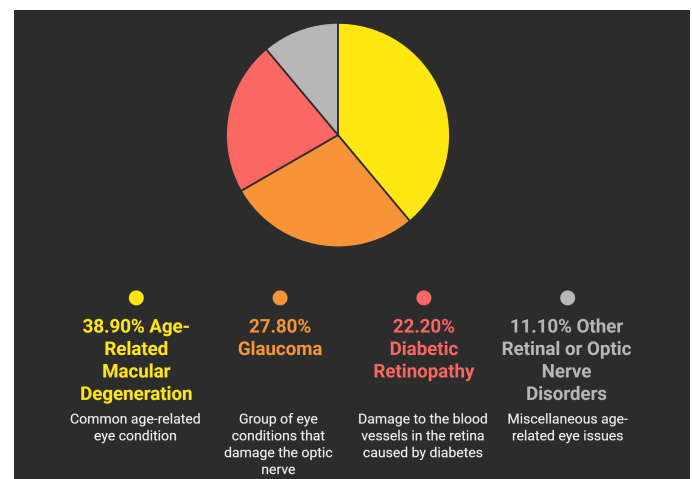


Fig: 1. Distribution of Primary Ocular Diagnoses in Elderly Patients

Significant improvements were observed across all assessed psychological and vision-related outcome measures following sustained participation in the low vision rehabilitation program. Mean Geriatric Depression Scale (GDS) scores showed a substantial reduction from 9.8 ± 3.1 at baseline to 6.4 ± 2.7 at follow-up, indicating a significant decrease in depressive symptoms ($p < 0.001$). Similarly, anxiety levels, measured using the HADS-Anxiety subscale, declined from 10.2 ± 2.8 to 7.1 ± 2.4 , reflecting a statistically

significant improvement ($p < 0.001$).

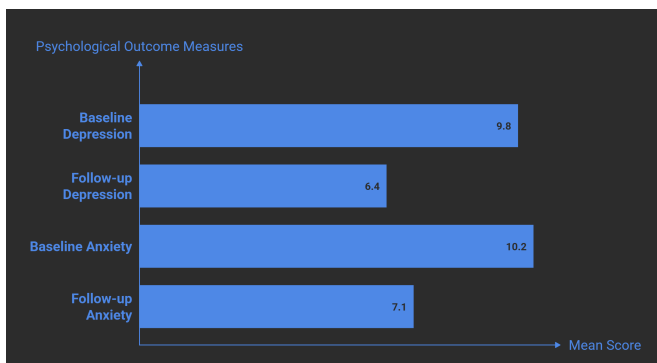


Fig. 2. Changes in Psychological Outcomes Following Long-Term Rehabilitation

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Association Between Rehabilitation Duration and Psychological Improvement: Correlation analysis revealed a significant relationship between the duration of rehabilitation and improvement in psychological outcomes. Longer engagement in low vision rehabilitation was moderately associated with greater reductions in depressive symptoms ($r = -0.46$, $p = 0.002$) and anxiety levels ($r = -0.41$, $p = 0.004$). Positive correlations were observed between rehabilitation duration and increases in self-efficacy ($r = 0.49$, $p = 0.001$) and vision-related quality of life scores ($r = 0.52$, $p < 0.001$). These findings indicate that sustained rehabilitation contributes not only to functional adaptation but also to meaningful psychological adjustment over time. The relationship between rehabilitation duration and improvement in quality-of-life scores.

DISCUSSION

The present study demonstrates that long-term low vision rehabilitation (LVR) is associated with significant improvements in psychological wellbeing among elderly patients with age-related ocular diseases. Sustained participation in a structured rehabilitation program resulted in measurable reductions in depressive and anxiety symptoms, alongside notable gains in self-efficacy and vision-related quality of life. These findings underscore the importance of viewing low vision rehabilitation not solely as a functional intervention, but as a comprehensive strategy addressing the psychological consequences of irreversible visual impairment in older adults. A key observation of this study is the significant reduction in depressive symptoms following prolonged rehabilitation. Visual impairment in later life is frequently accompanied by loss of independence, social withdrawal, and reduced self-esteem, all of which contribute to depression. The observed decrease in GDS scores suggests that rehabilitation interventions, particularly those focusing on functional independence and adaptive coping, may mitigate the emotional distress associated with chronic vision loss. This aligns with the growing body of evidence emphasizing the role of rehabilitative care in improving mental health outcomes among visually impaired elderly populations.

Anxiety levels also declined significantly over the course of rehabilitation. Anxiety in individuals with low vision often stems from fear of falls, dependence on others, and uncertainty about daily functioning. Orientation and mobility training, assistive device instruction, and repeated reinforcement of skills may have contributed to greater confidence and reduced anxiety. The structured and multidisciplinary nature of the rehabilitation program likely played a central role in addressing both functional limitations and psychological concerns. Importantly, the study revealed substantial improvements in self-efficacy, reflecting enhanced confidence in managing daily activities despite visual limitations. Self-efficacy is a critical psychological determinant of successful rehabilitation outcomes, as individuals who believe in their ability to adapt are more likely to engage actively with rehabilitation strategies. The increase in self-efficacy observed in this study suggests that long-term engagement allows patients sufficient time to master assistive devices, integrate compensatory strategies into daily routines, and regain a sense of control over their environment.

Vision-related quality of life showed significant improvement following rehabilitation, further supporting the holistic benefits of long-term LVR. Improvements in NEI VFQ-25 scores indicate better perceived visual functioning, social participation, and emotional wellbeing. These improvements are clinically

meaningful, as quality of life is a central outcome in chronic visual impairment where restoration of vision is often not possible.

A notable finding of this study is the positive association between rehabilitation duration and psychological improvement. Longer engagement in rehabilitation was correlated with greater reductions in depression and anxiety and larger gains in self-efficacy and quality of life. This highlights the importance of sustained rehabilitation rather than short-term or episodic interventions. Psychological adaptation to vision loss is a gradual process, and prolonged rehabilitation may provide the necessary time for emotional adjustment, skill consolidation, and behavioural change. Despite its strengths, this study has certain limitations. The absence of a control group limits causal inference, and the findings rely on self-reported psychological measures, which may be subject to response bias. Additionally, the study was conducted at a single tertiary care center, which may affect the generalizability of results to other settings. Future studies employing randomized controlled designs, larger sample sizes, and longer follow-up periods are warranted to further validate these findings.

CONCLUSION

This study demonstrates that long-term low vision rehabilitation yields significant psychological benefits for elderly patients with age-related ocular diseases. Sustained participation in structured rehabilitation was associated with meaningful reductions in depression and anxiety, alongside improvements in self-efficacy and vision-related quality of life. These findings highlight that effective low vision rehabilitation extends beyond functional support, playing a critical role in psychological adaptation and emotional wellbeing. The positive association between rehabilitation duration and psychological improvement underscores the importance of continuous, long-term rehabilitative care rather than short-term interventions. Integrating psychological assessment, counseling, and individualized rehabilitation strategies within low vision services may enhance overall outcomes for elderly individuals living with irreversible visual impairment.

DECLARATIONS

Ethical Approval: The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Committee of the participating tertiary eye care center prior to the commencement of the study.

Informed Consent: Written informed consent was obtained from all participants before enrollment. Participants were provided with detailed information regarding the study objectives, procedures, potential benefits, and their right to withdraw at any stage without affecting their standard of care.

Consent for Publication: Not applicable. The study does not include any identifiable personal data or images of participants.

Availability of Data and Materials: The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Competing Interests: The authors declare that they have no competing interests.

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Authors' Contributions: All authors contributed significantly to the study conception, design, data collection, analysis, interpretation of results, and manuscript preparation. All authors read and approved the final manuscript.

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