



## Quality of life among patients with open-angle glaucoma at Hanoi Eye Hospital in 2025

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### ABSTRACT

**Objective:** To describe the current status of vision-related quality of life among patients with open-angle glaucoma at Hanoi Eye Hospital in 2025. **Methods:** A cross-sectional descriptive study was conducted using the 25-item National Eye Institute Visual Function Questionnaire on 215 patients diagnosed with OAG attending the glaucoma outpatient clinic at Hanoi Eye Hospital. **Results:** The overall vision-related quality of life among the participants was generally low, with a mean score of  $41.7 \pm 18.6$  out of 100. Over 60% of the patients scored below 50. The domains most severely impaired were general vision and dependency, whereas activities such as driving and color vision were relatively preserved. Notably, visual impairment was associated with a reduced capacity for disease self-management, reflecting underlying limitations in patients' awareness and self-care behaviors. **Conclusion:** The vision-related quality of life of patients with open-angle glaucoma at Hanoi Eye Hospital is predominantly at a moderate level. These findings highlight the urgent need to implement comprehensive intervention strategies to enhance the well-being of this vulnerable patient population.

**Keywords:** Quality of life, Open-Angle Glaucoma, vision-related quality of life

### INTRODUCTION

Glaucoma is an optic neuropathy typically associated with elevated intraocular pressure (IOP). Characterized by an insidious and asymptomatic progression, it remains the leading cause of irreversible blindness worldwide, particularly among the elderly population <sup>1</sup>. In its early stages, the disease often develops slowly without noticeable symptoms, leading to delayed diagnoses until significant visual impairment has already occurred. According to the World Health Organization (WHO), approximately 76 million individuals globally were living

with glaucoma in 2020, and this prevalence is projected to rise parallel to the increasing global life expectancy <sup>2</sup>.

The contemporary management of open-angle glaucoma (OAG) extends beyond the mere reduction of IOP; it increasingly prioritizes the preservation and enhancement of the patient's vision-related quality of life (VRQoL). The VRQoL of OAG patients is profoundly affected not only by the severity of vision loss but also by its secondary impacts on independence, social participation, and psychological well-being <sup>3</sup>. Prolonged and irreversible visual impairment significantly

restricts daily activities, such as reading, driving, navigating safely, and recognizing faces, which subsequently diminishes patient autonomy and exacerbates feelings of isolation.

Previous literature demonstrates that OAG patients generally report a significantly lower QoL compared to individuals without ophthalmic conditions, particularly in domains related to mobility, personal care, and social interactions<sup>1, 3</sup>. Furthermore, psychological factors play a crucial role; patients exhibiting a positive illness perception tend to maintain a higher QoL, whereas persistent anxiety and distress regarding progressive vision loss can substantially deteriorate their overall well-being<sup>4</sup>.

In Vietnam, the incidence of glaucoma is rising concurrently with the rapid aging of the population. Despite this growing disease burden, empirical research focusing on the VRQoL of OAG patients remains sparse. Therefore, assessing the QoL of this specific population is essential to provide an evidence-based foundation for developing comprehensive care strategies. By addressing both the clinical and psychosocial needs of patients, healthcare providers can facilitate earlier detection, implement timely interventions, and ultimately alleviate the disease burden. Consequently, this study was conducted to describe the current status of the quality of life among patients with open-angle glaucoma at Hanoi Eye Hospital in 2025.

## METHODS

**Subjects:** The study population comprised patients aged 18 years and older diagnosed with OAG presenting at the Glaucoma Clinic, Examination Department of Hanoi Eye Hospital.

**Inclusion criteria:** Patients with a confirmed clinical diagnosis of OAG, who possessed the cognitive and communicative abilities to accurately respond to the questionnaire and voluntarily provided informed consent to participate.

**Exclusion criteria:** Patients with communication barriers or cognitive impairments; and those whose visual impairment was primarily attributed to other concomitant ocular pathologies, such as corneal diseases, cataracts, or retinal disorders.

**Study setting and duration:** The research was conducted at the Glaucoma Clinic, Examination Department, Hanoi Eye Hospital, spanning from February to August 2025. The primary data collection phase took place between March and June 2025.

**Research design:** A cross-sectional descriptive study design

**Sample size and sampling method:** The sample size was determined using the formula for estimating a population mean:

$$n = \frac{Z_{1-\alpha/2}^2 \times \sigma^2}{d^2}$$

Where:  $n$  is the minimum required sample size.  $Z_{1-\alpha/2} = 1.96$  with a significance level of  $\alpha = 0.05$ .  $\sigma$  is the standard deviation of the QoL score in glaucoma patients, estimated at  $\sigma = 0.5$  based on a prior study by Nelson et al<sup>6</sup>.  $d$  is the allowable margin of error, set at  $d = 0.07$ .

Applying these parameters, the calculated minimum sample size was 196. To account for a potential 10% non-response or dropout rate, the final sample size was adjusted to 215 patients.

Participants were recruited using a convenience sampling method.

**Instruments:** A structured questionnaire consists of two parts:

Part 1: Sociodemographic Characteristics, such as age, gender, marital status, occupation, education level, living arrangements, and economic status.

Part 2: Vision-Related Quality of Life was assessed by the validated Vietnamese version of the 25-item National Eye Institute Visual Function Questionnaire (NEI VFQ-25), originally developed by the National Eye Institute (USA) <sup>5</sup>. This instrument evaluates VRQoL across 12 sub-domains on a 0–100 scale, where higher scores indicate better visual functioning. To facilitate clinical interpretation, the continuous scores were additionally categorized into four levels: Poor (< 25 points), Moderate (25–49 points), Good (50–74 points), and Very good (75–100 points). The questionnaire demonstrated excellent internal consistency in this study (Cronbach’s Alpha = 0.93).

**Data collection:** Data were collected via direct, face-to-face interviews. Data collection was systematically conducted every Wednesday morning in a designated, private room at the glaucoma clinic to ensure patient confidentiality. Trained researchers

conducted the interviews and meticulously cross-checked the completed questionnaires with the respondents to ensure data accuracy and completeness prior to final submission.

**Statistical analysis:** Data were entered, cleaned, and analyzed using SPSS statistical software. Descriptive statistics were employed: categorical variables were summarized using frequencies and percentages, while continuous variables were expressed as means and standard deviations (SD).

**Ethical considerations:** The study protocol was reviewed and approved by the Institutional Review Board of Nam Dinh University of Nursing (Approval No. 584/GCN-HDDD, dated March 5, 2025). Participation was strictly voluntary, and written informed consent was obtained from all participants after they were fully briefed on the study’s objectives. To maintain anonymity, all personal identifiers were replaced with study codes. Participants retained the right to withdraw from the study at any time without their medical care being compromised. The research posed no physical or psychological harm to the participants.

## RESULTS

**Table 1. Demographic characteristics of the study subjects (N = 215)**

	Characteristics	n	%
Age (years)	< 40	8	3.7
	40 – 60	55	25.6
	> 60	152	70.7
	Mean ± SD: 64.14 ± 10.98		
Gender	Male	87	40.5
	Female	128	59.5

Characteristics		n	%
Living conditions	Living alone	31	14.4
	Living with spouse	105	48.8
	Living with spouse and children	79	36.7
Occupation	Retirement	69	32.1
	Civil servants/Officials	70	32.6
	Workers	33	15.3
	Freelancers	43	20.0

As detailed in Table 1, the mean age of the cohort was  $64.14 \pm 10.98$  years (range: 24–88), indicating a predominantly elderly population, with 70.7% of patients aged over 60 years. Females accounted for 59.5% of the participants. The majority of patients (85.5%) lived with their families, whereas 14.4% lived alone. Regarding occupational status, retirees and civil servants comprised the largest proportion, at 32.1% and 32.6%, respectively.

**Table 2. Clinical characteristics of study subjects (N = 215)**

Characteristics		Right eye		Left Eye	
		n	%	n	%
Visual Acuity (Snellen)	$\geq 6/18$	92	42.8	99	46.0
	$< 6/18 - 6/60$	98	45.6	94	43.7
	$< 6/60 - 3/60$	18	8.4	13	6.0
	$< 3/60$ - Light perception	7	3.2	9	4.3
Intraocular Pressure (mmHg)	$< 5$	0	0	1	0.5
	5 - 21	205	95.3	210	97.7
	$> 21$	10	4.7	4	2.9

Table 2 revealed that the majority of participants maintained relatively preserved visual acuity, with 68.4% achieving a Snellen visual acuity of  $\geq 6/18$  across both eyes. Severe visual impairment ( $< 3/60$  to light perception) was observed in only a small fraction of the affected eyes (3.2% in the right eye and 4.3% in the left eye). Furthermore, optimal intraocular pressure (IOP) control (5–21 mmHg) was noted in the vast majority of cases (95.3% for the right eye and 97.7% for the left eye).

**Table 3. NEI VFQ-25 scores by domain (N = 215)**

Domains	Mean $\pm$ SD	Classification
Overall Score	41.7 $\pm$ 18.6	Moderate
General Vision	39.7 $\pm$ 19.6	Moderate
Mental Health	41.1 $\pm$ 19.2	Moderate
Ocular Pain	44.8 $\pm$ 21.3	Moderate
Distance Activities	41.8 $\pm$ 20.5	Moderate
Near Activities	42.0 $\pm$ 20.4	Moderate
Peripheral Vision	43.3 $\pm$ 20.7	Moderate
Color Vision	45.4 $\pm$ 21.5	Moderate
Social Functioning	41.6 $\pm$ 19.0	Moderate
Driving	46.2 $\pm$ 18.5	Moderate
Role Difficulties	41.9 $\pm$ 18.9	Moderate
Dependency	40.7 $\pm$ 20.2	Moderate

The assessment of VRQoL utilizing the NEI VFQ-25 instrument demonstrated an overall mean score of  $41.7 \pm 18.6$ , reflecting a moderate level of impairment across multiple life aspects. As shown in Table 3, the sub-domains that retained the highest functional scores were “Driving” ( $46.2 \pm 18.5$ ) and “Color Vision” ( $45.4 \pm 21.5$ ), suggesting that patients still preserved certain specific visual capabilities. Conversely, the most profoundly impacted domains were “General Vision” ( $39.7 \pm 19.6$ ) and “Dependency” ( $40.7 \pm 20.2$ ), indicating substantial difficulties in overall perception and a diminished sense of autonomy in daily life.

**Table 4. Distribution of overall NEI VFQ-25 scores (N = 215)**

Score Categories	n	%
Poor (< 25 points)	53	24.6
Moderate (25–49 points)	78	36.3
Good (50–74 points)	73	34.0
Very Good (75–100 points)	11	5.1
Mean $\pm$ SD	41.7 $\pm$ 18.6	

The majority of the patients (60.9%) reported VRQoL scores below 50 points. Specifically, the largest segment fell into the “Moderate” category (36.3%), followed by the “Poor” category (24.6%). Only 5.1% of the participants achieved a “Very Good” VRQoL score ( $\geq 75$  points), highlighting the pervasive and debilitating impact of visual impairment on this patient population.

## DISCUSSION

The present study demonstrated that VRQoL among patients with OAG was moderately impacted, with domain scores of the NEI VFQ-25 ranging from 39.7 to 46.2. This finding is consistent with Nelson et al <sup>6</sup>, who reported that glaucoma patients frequently experience diminished VFQ-25 scores, particularly in the domains of general vision and dependency. This underscores that the burden of OAG extends beyond structural visual impairment to encompass psychological distress, loss of autonomy, and a generalized reduction in overall QoL. Similarly, Hirooka et al <sup>7</sup> in Japan observed the lowest scores in the general vision domain, emphasizing the critical relationship between central visual acuity, visual field defects, and patient-reported outcomes.

Conversely, consistent with Sen et al <sup>8</sup> in India, our cohort maintained higher functional scores in driving and color vision. This is characteristic of early-to-moderate stage glaucoma, where central vision is relatively preserved despite peripheral vision loss. A review by Quaranta et al <sup>9</sup> further corroborated that dependency and general vision are highly susceptible to early impairment, whereas color discrimination and driving are typically compromised only in advanced stages of the disease. This phenomenon reflects the insidious natural history of OAG; however, heightened disease awareness, anticipatory anxiety regarding future blindness, and a growing sense of dependency significantly depress scores in the general vision and mental health domains long before total vision loss occurs.

The mean scores for distance and near activities were also found to be moderate,

aligning with Dhawan et al <sup>3</sup>, who noted that despite retaining central vision, OAG patients face substantial functional challenges in daily living. Furthermore, Hirooka et al <sup>7</sup> highlighted that peripheral visual field decline is the strongest determinant affecting QoL, which explains the high variability observed in our study's peripheral vision scores. Domain scores for social functioning, role difficulties, and dependency all fell below 45, indicating a pronounced restriction on independent living. This aligns with Rossi et al <sup>10</sup> who established a strong correlation between visual field loss, perceived dependency, and social activity limitations. These psychological burdens are often exacerbated by a lack of community-based psychosocial support and visual rehabilitation programs.

The study is subject to certain limitations. The cross-sectional design and the use of convenience sampling at a single hospital limit causal inferences and the generalizability of the findings to the broader community. Future longitudinal, multi-center studies integrating objective clinical indices with comprehensive psychosocial evaluations are warranted to provide a more holistic assessment of QoL in glaucoma patients.

## CONCLUSION

In conclusion, the VRQoL of patients with open-angle glaucoma at Hanoi Eye Hospital was predominantly moderate, with an overall NEI VFQ-25 mean score of  $41.7 \pm 18.6$ . The most profoundly affected domains encompassed general vision, dependency, role difficulties, and both near and distance activities. Conversely, specific functions such as driving, color vision, and peripheral vision remained relatively preserved, reflecting the retention of certain visual

capabilities. These findings emphasize that optimal OAG management necessitates a holistic approach; clinical interventions aimed at controlling intraocular pressure must be complemented by psychological support, visual rehabilitation, and targeted health education to sustainably improve patient outcomes.

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