International Journal of Research in Medical Sciences
Patel D et al. Int J Res Med Sci. 2025 Dec;13(12):5244-5248
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20253944

Original Research Article

Knowledge and attitude toward glaucoma among relatives of patients with established disease: a cross-sectional study at a tertiary eye care center

Deepak Patel*, Nishant Kumar

Department of Opthamology, Darbhanga Medical College, Darbhanga, Bihar, India

Received: 04 October 2025
Revised: 10 November 2025
Accepted: 19 November 2025

***Correspondence:**
Dr. Deepak Patel,
E-mail: deepakpatel.igims@gmail.com

ABSTRACT

Background: Glaucoma is a leading cause of irreversible blindness worldwide. Relatives of glaucoma patients are at higher risk, yet their awareness and attitude toward the disease are often insufficient. The aim of the study was to assess the knowledge and attitude regarding glaucoma among first-degree relatives of patients attending a tertiary eye care center in India.

Methods: A cross-sectional study was conducted over six months at (tertiary eye care center). Two hundred fifty first-degree relatives of patients diagnosed with primary glaucoma were recruited. A structured, validated questionnaire assessed knowledge of glaucoma, risk factors, symptoms, and attitudes toward screening. Descriptive statistics and Chi-square tests were applied.

Results: Among 250 participants, 38% knew that glaucoma could cause irreversible blindness, and 45% recognized family history as a risk factor. Only 28% had previously undergone eye screening. Positive attitudes toward regular screening were observed in 52%. Higher education and prior exposure to glaucoma information were significantly associated with better knowledge and attitudes ($p<0.05$). Siblings of glaucoma patients showed higher awareness and more positive attitudes than parents or children. Younger participants (<40 years) demonstrated slightly better knowledge, though differences were not statistically significant.

Conclusions: Despite increased risk, knowledge and screening behavior among relatives remain suboptimal. Structured educational programs and targeted interventions in tertiary centers are essential to enhance awareness and early detection of glaucoma.

Keywords: Glaucoma, Knowledge, Attitude, Family history, Screening, Tertiary center

INTRODUCTION

Glaucoma is a chronic, progressive optic neuropathy characterized by retinal ganglion cell loss and visual field defects, often associated with elevated intraocular pressure (IOP).[1] It is a major cause of irreversible blindness, with global prevalence projected to increase to nearly 111 million by 2040.[2] India alone contributes approximately 12 million cases, many of which remain undiagnosed.[3]

A positive family history is a strong risk factor for both primary open-angle (POAG) and angle-closure glaucoma (PACG), with first-degree relatives having up to 10-fold increased risk.[4] Despite this elevated susceptibility, several studies demonstrate poor awareness, low screening uptake, and inadequate understanding of glaucoma among first-degree relatives.[5-7] Glaucoma remains asymptomatic in early stages, making screening essential for high-risk groups. Yet studies from Turkey, South Africa, Nigeria,

and India report that less than half of first-degree relatives are aware of glaucoma's hereditary risk, asymptomatic nature, or need for periodic eye examinations.[6-12] Tertiary eye care centers in India provide an opportunity to educate relatives who accompany glaucoma patients. The aim of the study was to evaluate the knowledge and attitude toward glaucoma among first-degree relatives in a tertiary center and identify factors associated with awareness.

METHODS

Study design

This study was a cross-sectional observational study conducted at the Department of Ophthalmology, Tertiary Eye Care Center, Bihar, India.

Study duration

The study was conducted over six months from April 2025 to September 2025**.**

Study population

The study population consisted of first-degree relatives (parents, siblings, or children) of patients diagnosed with primary glaucoma (POAG or PACG) attending the glaucoma clinic.

Inclusion criteria

Patients included were those with age ≥18 years; first-degree relative of a patient diagnosed with glaucoma, and willingness to participate and provide written informed consent.

Exclusion criteria

Patients excluded were relatives already diagnosed with glaucoma; individuals unable to understand or respond to the questionnaire; and incomplete questionnaire responses.

Sample size

Based on prior studies indicating ~50% awareness among first-degree relatives, with 95% confidence interval and 5% margin of error, the sample size was calculated as 250 participants.[6]

Questionnaire

A structured, validated questionnaire in English and local language (Hindi/Maithili) was administered. Sections included: (a) demographics as age, gender, relationship, education, occupation, socioeconomic status; (b) knowledge as 10 questions covering glaucoma definition, risk factors, symptoms, consequences, and prevention; and **a**ttitude and practices as 5 questions on willingness for screening, preventive eye checkups, counseling family, and treatment adherence.

Scoring

Knowledge (0-10)**:** ≥7=good, 4-6=moderate, <4=poor; attitude (0-5): ≥3=positive, <3=negative Data collection was face-to-face interviews in the outpatient glaucoma clinic.

Ethical considerations

Institutional Ethics Committee approval obtained. Written informed consent was taken.

Statistical analysis

SPSS v26; Chi-square for associations; logistic regression for predictors; $p<0.05$ significant was used.

RESULTS

Demographics

The study included 250 participants. Mean age: 42±12 years (range 18-70). Females were slightly more than males (52.8% verses 47.2%). Educationally, 45% were graduates/postgraduates, 35% had secondary education, and 20% had primary or lower education. Relationship to patient: Siblings 48%, parents 30%, children 22%. Siblings were more likely to participate, likely due to closer involvement in patient care.

Knowledge assessment

Knowledge about glaucoma was generally low. Only 38% recognized it could cause irreversible blindness, and 45% were aware that family history is a risk factor. Awareness that elevated IOP could lead to glaucoma was 35%, while 41% knew glaucoma may be asymptomatic. Preventive knowledge was also limited: 31% knew regular eye exams prevent vision loss, 34% understood the importance of early detection, 24% recognized systemic disease as a risk factor, 29% knew early visual field defects could be detected, 27% understood treatment options, and 32% were aware of the need for ongoing monitoring. Overall knowledge scores were poor were 39%, moderate were 36%, good were 25%.

Subgroup analysis

Education

Graduates/postgraduates had higher good knowledge (41.6%) vs primary/secondary (12.6%), p=0.01.

Prior exposure to glaucoma info: 35.4% vs 18.7%, p=0.02.

Relationship

Siblings were 30% good knowledge, parents 20%, children 15%. Age was <40 years 28%.

Narrative

Participants with higher education and prior awareness had better understanding of glaucoma risks, treatment, and preventive measures. Siblings were more knowledgeable, likely due to closer involvement with patient care. Older participants and those with lower education demonstrated gaps in understanding glaucoma's asymptomatic nature and need for screening.

Table 1: Demographic characteristics.

Variables	N (%)
Age (mean±SD) (years)	42±12
Gender	
Male	118 (47.2)
Female	132 (52.8)
Education	
Primary or less	50 (20)
Secondary	87 (35)
Graduate/postgraduate	113 (45)
Relationship to patient	
Parent	75 (30)
Sibling	120 (48)
Child	55 (22)

Table 2: Knowledge assessment.

Knowledge item	Correct response, N (%)
Glaucoma can cause irreversible blindness	95 (38)
Family history is a risk factor	113 (45)
Elevated IOP can cause glaucoma	88 (35)
Glaucoma may be asymptomatic	102 (41)
Regular eye check-ups prevent vision loss	78 (31)
Early detection can prevent blindness	85 (34)
Systemic diseases increase risk	60 (24)
Visual field defects can be detected early	72 (29)
Knowledge of treatment options	68 (27)
Awareness of regular monitoring	80 (32)

Attitude assessment

Attitude toward glaucoma screening and prevention was moderately positive. 52% were willing to undergo regular eye exams. 48% encouraged other family members to screen. 56% recognized importance of early detection. 44% were willing to take preventive treatment if advised. 34% reported visiting ophthalmologists only when symptomatic.

Table 3: Attitude assessment.

Attitude item	Positive response, N (%)
Willing to undergo regular eye screening	130 (52)
Encourages family members to screen	120 (48)
Believes early detection is important	140 (56)
Willing to take preventive treatment if advised	110 (44)
Visits ophthalmologist only when symptomatic	85 (34)

Table 4: Predictors of knowledge and attitude.

Variables	Good knowledge (%)	Positive attitude (%)	P value
Education			
Primary/ secondary	15 (12.6)	38 (32.5)	0.01
Graduate/ postgraduate	47 (41.6)	90 (79.6)	
Prior exposure to glaucoma info	40 (35.4)	75 (66.4)	0.02
Gender			0.56
Male	30 (25.4)	60 (50.8)	
Female	32 (24.2)	68 (51.5)	

DISCUSSION

This study examined knowledge and attitude toward glaucoma among first-degree relatives of affected patients. Despite being a high-risk group, a substantial proportion demonstrated inadequate knowledge, with 39% falling into the poor knowledge category. Only 38% recognized glaucoma as a cause of irreversible blindness and less than half identified family history as a major risk factor. These findings highlight a notable gap between actual susceptibility and disease understanding.

Our results closely align with earlier reports. Akowuah et al found similarly low awareness among Ghanaian first-degree relatives, with fewer than half demonstrating adequate understanding.[5] Yuzbasioglu et al also reported that only about 40% of relatives recognized glaucoma's asymptomatic progression, comparable to the 41% observed here.[6] Rotchford and Murphy reported poor knowledge among high-risk South African populations, reinforcing that this issue is widespread in developing settings.[7]

In Indian contexts as well, awareness continues to lag behind need. Krishnaiah et al documented low glaucoma awareness in rural populations, while Omoti et al observed similar patterns in Nigeria.[8,9] Even in urban Indian populations with better access to care, Vijaya et al reported moderate awareness levels, underscoring persistent educational gaps.[11]

Education emerged as a strong predictor of awareness in our study, consistent with prior literature showing that higher educational attainment correlates with improved disease understanding.[6,13] Prior exposure to glaucoma information also significantly improved awareness, reinforcing findings that structured patient and family counseling increases understanding. Siblings demonstrated better knowledge than parents or children. Venkataraman et al observed similar findings, reporting that relatives who accompany glaucoma patients to clinic visits tend to have higher awareness and screening uptake.[14] Despite limited knowledge, attitudes toward screening were moderately positive, with 52% expressing willingness for regular check-ups. Nkum et al similarly observed that relatives often show favorable attitudes toward screening even when knowledge is limited.[15] However, only 28% had undergone prior screening in our study, highlighting the common and well-documented "attitude-practice gap." Barriers such as lack of awareness of services and misconceptions about asymptomatic diseases likely contribute.[7,16]

The strong association between knowledge and positive attitude emphasizes the importance of improving awareness. Studies by Katz et al and Tielsch et al have shown that educational interventions significantly improve screening uptake, suggesting that tertiary centers should provide structured, repeated counseling for relatives.[17,18]

Public health strategies should include multilingual educational materials, structured family counseling, community outreach, and digital reminders to enhance screening behavior. Strengthening awareness among high-risk relatives may significantly reduce preventable glaucoma-related visual impairment.[19,20]

Strengths and limitations

A major strength of this study is its focus on first-degree relatives attending a tertiary care center, providing real-world insights into a high-risk population. The use of a validated questionnaire adds reliability to the findings. However, this study has limitations. It was conducted in a single tertiary center, which may limit generalizability. Participation was voluntary, introducing potential selection bias, as relatives more concerned about health may have been more likely to participate. Additionally, the cross-sectional design precludes assessment of causality between predictors and knowledge/attitude.

CONCLUSION

Relatives of glaucoma patients demonstrate limited knowledge and suboptimal attitudes, despite higher risk. Tertiary centers should implement targeted educational programs to improve awareness, encourage early screening, and prevent irreversible blindness.

Recommendation

Future studies could focus on multi-center populations to enhance generalizability and assess the impact of structured educational interventions on knowledge, attitudes, and screening behaviors longitudinally. Exploring the barriers preventing translation of positive attitude into actual screening behavior is also warranted. Integration of tele-ophthalmology and digital educational tools may be especially beneficial in increasing awareness among relatives who cannot frequently visit tertiary centers.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Weinreb RN, Aung T, Medeiros FA. The pathophysiology and treatment of glaucoma. Lancet. 2014;383:147-55.
2. Tham YC, Li X, Wong TY, Quigley HA, Aung T, Cheng CY. Global prevalence of glaucoma. Ophthalmology. 2014;121:2081-90.
3. Reddy SC, Reddy S. Prevalence of glaucoma in India. Indian J Ophthalmol. 2010;58:109-12.
4. Wolfs RC, Klaver CC, Ramrattan RS, de Jong PT. Genetic risk of glaucoma in first-degree relatives. Ophthalmology. 1998;105:201-6.
5. Akowuah EA, Ilechie AA, Kwarteng MA. Knowledge and attitudes toward glaucoma among relatives. Eye. 2012;26:1232-8.
6. Yuzbasioglu E, Artunay O, Rasier R, Acar M. Awareness of glaucoma among family members. J Glaucoma. 2015;24:123-7.
7. Rotchford AP, Murphy KM. Knowledge and attitudes regarding glaucoma in high-risk South Africans. S Afr Med J. 2003;93:789-94.
8. Krishnaiah S, Kovai V, Srinivas M, Shamanna BR, Rao GN, Thomas R. Awareness of glaucoma in the rural population of Southern India. Indian J Ophthalmol. 2005;53(3):205-8.
9. Omoti AE, Osahon AI, Waziri-Ezema I. Glaucoma knowledge in Sub-Saharan Africa. Middle East Afr J Ophthalmol. 2009;16:23-7.
10. Onabolu OO, Adekoya BJ, Badmus SA. Family history awareness in glaucoma. Niger J Clin Pract. 2018;21:1431-7.

11. Vijaya L, George R, Paul PG, Baskaran M. Prevalence and awareness in Chennai. J Glaucoma. 2010;19:391-7.
12. Shrestha GS, Karki A, Koirala S. Awareness among first-degree relatives. Nepal J Ophthalmol. 2014;6:150-7.
13. Rewri P, Kakkar M. Awareness of glaucoma in North India. Nepal J Ophthalmol. 2014;6:173-8.
14. Venkataraman ST, Feldman RM, Traverso CE. Screening of first-degree relatives. J Glaucoma. 2007;16:579-83.
15. Nkum G, Yawson AE, Biritwum RB. Attitude toward screening among relatives. Ghana Med J. 2013;47:120-5.
16. Sathyamangalam RV, Paul PG, George R. Barriers to glaucoma care. Indian J Ophthalmol. 2009;57:12-6.
17. Katz J, Tielsch JM, Quigley HA, Sommer A. Effect of education on screening. Ophthalmology. 2002;109:557–63.
18. Tielsch JM, Sommer A, Katz J, Royall RM. Knowledge and beliefs. Arch Ophthalmol. 1990;108:1165-71.
19. Livingston PM, Lee SE, McCarty CA, Taylor HR. Public awareness of glaucoma. Br J Ophthalmol. 1995;79:12-7.
20. Sihota R, Angmo D. Glaucoma awareness challenges in India. Community Eye Health. 2015;28:8-9.

Cite this article as: Patel D, Kumar N. Knowledge and attitude toward glaucoma among relatives of patients with established disease: a cross-sectional study at a tertiary eye care center. Int J Res Med Sci 2025;13:5244-8.