

## Original Research Article

# ASSESSMENT OF KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING GLAUCOMA AMONG ELDERLY PATIENTS ATTENDING A TERTIARY CARE HOSPITAL

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**ABSTRACT**

**Background:** Glaucoma is a chronic, progressive optic neuropathy requiring lifelong treatment and regular follow-up to prevent irreversible vision loss. Inadequate patient awareness may adversely affect disease control and visual outcomes, particularly among elderly individuals. The objective is to assess the knowledge, attitudes, and practices (KAP) regarding glaucoma among elderly patients attending a tertiary care hospital and to evaluate associations among KAP domains.

**Materials and Methods:** This hospital-based cross-sectional study was conducted at the Glaucoma Clinic of Dr. B.R. Ambedkar Medical College and Hospital, Bangalore, from December 2024 to March 2025. A total of 100 patients aged  $\geq 60$  years with a prior diagnosis of glaucoma were enrolled using purposive sampling. Data were collected using a predesigned structured questionnaire assessing KAP domains. Responses were scored and categorized as poor, average, good, and excellent.

**Results:** Among 100 participants, 53% were female, with a mean age of  $61.4 \pm 9.8$  years. Knowledge regarding glaucoma was inadequate, with only 22% aware that untreated disease can cause permanent vision loss and 21% recognizing the importance of regular follow-up. Attitudes were predominantly unfavorable, with 48% demonstrating poor attitude scores and only 8% excellent scores. Practices were similarly suboptimal, with 72% reporting discontinuation of treatment without medical advice and 59% missing scheduled follow-ups; overall, 58% demonstrated poor practice scores. A significant association was observed between knowledge and attitude ( $\chi^2 = 3.892, p = 0.048$ ).

**Conclusion:** The study demonstrates substantial deficiencies in KAP regarding glaucoma among elderly patients, highlighting the need for structured patient education and adherence-enhancing interventions to improve long-term disease outcomes.

**Keywords:** Glaucoma, Knowledge, Attitude, Practice, Elderly, Treatment adherence.

**INTRODUCTION**

Glaucoma is a group of chronic progressive optic neuropathies characterized by degeneration of retinal ganglion cells, resulting in characteristic optic nerve

head changes and corresponding visual field defects.<sup>[1]</sup> It is one of the leading causes of irreversible blindness worldwide and represents a major public health challenge. Globally, glaucoma affects approximately 3.54% of individuals aged 40–

80 years.<sup>[2]</sup> India bears a substantial share of the global burden, with nearly 11 million affected individuals.<sup>[3]</sup> The number of people living with glaucoma worldwide is projected to increase from 60.5 million in 2010 to 111.8 million by 2040, primarily due to population growth and increased life expectancy.<sup>[1]</sup>

Advancing age is among the most important risk factors for glaucoma, and disease prevalence increases significantly among older adults. Consequently, elderly individuals are particularly vulnerable to glaucoma-related visual impairment and blindness.<sup>[4]</sup> Vision loss due to glaucoma can adversely affect mobility, independence, social functioning, and overall quality of life. Furthermore, visual impairment among older adults is associated with an increased risk of falls, injuries, psychological distress, and functional dependency. Beyond its clinical consequences, glaucoma imposes a considerable social and economic burden on affected individuals, their families, and healthcare systems.<sup>[4]</sup> Despite significant advances in diagnostic and therapeutic modalities, glaucoma remains substantially underdiagnosed, particularly in developing countries. Approximately 75% of glaucoma cases remain undetected owing to inadequate awareness, limited access to eye care services, and the largely asymptomatic nature of the disease until advanced stages.<sup>[4,5]</sup> Delayed diagnosis is further compounded by poor health-seeking behavior, underutilization of preventive eye care services, and inadequate follow-up practices.<sup>[5,6]</sup> Since glaucomatous vision loss is irreversible, early diagnosis and timely intervention are critical for preserving visual function and preventing disease progression. Elevated intraocular pressure remains the most important modifiable risk factor and the primary target of glaucoma management.<sup>[1,4,5]</sup>

Enhancing public awareness and promoting early detection are among the most effective strategies for reducing glaucoma-related blindness. Awareness regarding glaucoma is influenced by several factors, including educational status, family history, media exposure, and information disseminated through governmental and non-governmental organizations.<sup>[7,8]</sup> Given that early diagnosis largely depends on patients' awareness and health-seeking behavior, Knowledge, Attitudes, and Practices (KAP) studies provide valuable insights into disease-related perceptions and behaviors. Adequate knowledge regarding glaucoma can facilitate early diagnosis and improve treatment adherence, while positive attitudes and appropriate practices, including regular eye examinations and compliance with prescribed therapy, are essential for preventing disease progression and vision loss.<sup>[9,10]</sup>

Although several studies,<sup>[3,11]</sup> have evaluated glaucoma awareness among urban, rural, and general outpatient populations, evidence regarding glaucoma-related knowledge, attitudes, and practices among elderly patients attending tertiary care hospitals in India remains limited, despite their

increased susceptibility to vision loss from the disease.

Therefore, the present study was undertaken to assess the knowledge, attitudes, and practices regarding glaucoma among elderly patients attending a tertiary care hospital. The findings are expected to identify gaps in awareness and health-seeking behaviors and contribute to the development of targeted educational and preventive strategies aimed at reducing the burden of glaucoma-related visual impairment and blindness among the elderly population.

## MATERIALS AND METHODS

**Study Setting and Design:** The present hospital-based cross-sectional observational study was conducted at the Glaucoma Clinic of Dr. B.R. Ambedkar Medical College and Hospital, Bangalore, from December 2024 to March 2025. The study was undertaken to assess the knowledge, attitudes, and practices regarding glaucoma among elderly patients attending a tertiary care hospital. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

**Study Participants:** A total of 100 elderly patients previously diagnosed with glaucoma and attending the glaucoma clinic during the study period were enrolled in the study using purposive sampling. Eligibility of participants was determined according to the predefined inclusion and exclusion criteria.

### Inclusion Criteria

- Patients aged 60 years and above
- Previously diagnosed with glaucoma
- Attending the glaucoma clinic during the study period
- Willing to provide written informed consent
- Able to comprehend and respond to the structured questionnaire

### Exclusion Criteria

- Severe cognitive impairment or dementia (Mini-Mental State Examination score <18) precluding adequate understanding of the questionnaire or provision of informed consent
- Acute severe systemic illness or terminal medical condition at the time of interview
- Acute ocular emergencies, including acute angle-closure glaucoma or recent ocular trauma
- History of ocular surgery within the preceding one month
- Patients unwilling to participate in the study

**Ethical Considerations:** Ethical approval was obtained from the Institutional Ethics Committee (IEC) of Dr. B.R. Ambedkar Medical College and Hospital, Bangalore. Written informed consent was obtained from all participants prior to enrollment. Participants were informed about the objectives and procedures of the study, and confidentiality of all collected information was strictly maintained. Participation was entirely voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences.

**Data Collection Methodology:** Data were collected through face-to-face interviews using a predesigned and validated structured questionnaire. Sociodemographic information, including age, gender, educational status, occupation, duration of glaucoma, family history of glaucoma, and treatment-related details, was recorded for each participant. All collected data were anonymized and coded to ensure confidentiality.

**Knowledge, Attitude, and Practice Assessment:** The questionnaire consisted of 27 items distributed across three domains: knowledge, attitude, and practice.

**Knowledge Assessment:** The knowledge domain comprised 10 questions assessing participants' awareness regarding glaucoma, including permanent vision loss, asymptomatic disease progression, hereditary risk factors, the role of intraocular pressure, treatment modalities, medication use, correct eye drop instillation techniques, and the importance of regular follow-up and eye examinations.

**Attitude Assessment:** The attitude domain comprised 9 questions evaluating participants' perceptions and beliefs regarding glaucoma management, including acceptance of lifelong treatment, perceived effectiveness of therapy, willingness to attend regular follow-up visits, concerns regarding vision loss, treatment-related expenses, and willingness to encourage glaucoma screening among family members.

**Practice Assessment:** The practice domain comprised 8 questions assessing glaucoma-related health behaviors, including adherence to prescribed medications, regular attendance at follow-up visits, discontinuation of treatment without medical advice, proper eye drop instillation techniques, checking medication expiry dates, and hand hygiene practices before eye drop administration.

**Scoring and Classification:** Each correct or favorable response was assigned a score of 1, whereas each incorrect or unfavorable response was assigned a score of 0. Knowledge, attitude, and practice scores were calculated separately for each domain and converted into percentages. Based on the percentage scores obtained, participants were categorized as follows:

- Poor: <25%
- Average: 25–50%
- Good: 50–75%
- Excellent: >75%

**Statistical Analysis:** Data were entered into Microsoft Excel (Version 2019) and analyzed using IBM SPSS Statistics software (Version 22.0). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participants' sociodemographic characteristics and questionnaire responses. The results were presented in the form of tables and charts wherever appropriate. Associations between sociodemographic variables and KAP levels, as well as relationships among knowledge, attitude, and practice domains, were assessed using the Chi-square ( $\chi^2$ ) test. Degrees of freedom and corresponding p-values were calculated for each analysis. A p-value of less than 0.05 was considered statistically significant.

## RESULTS

A total of 100 participants were enrolled in the study, comprising 53 females (53%) and 47 males (47%). The age of participants ranged from 40 to 80 years, with a mean age of  $61.4 \pm 9.8$  years. The majority of participants (62%) had been diagnosed with glaucoma within the preceding 1–5 years.

**Table 1: Knowledge Level Regarding Glaucoma (n = 100)**

Sr. No.	Knowledge Questions	Yes (n)	No (n)
1	Awareness that glaucoma can cause permanent vision loss if untreated	22	78
2	Understanding that glaucoma treatment controls the disease rather than curing it	28	72
3	Knowledge that family history is a significant risk factor for glaucoma	54	46
4	Awareness of the asymptomatic nature of glaucoma in early stages	48	52
5	Knowledge of high intraocular pressure as a risk factor	39	61
6	Awareness that glaucoma leads to irreversible vision loss	34	66
7	Knowledge of the importance of routine eye check-ups	16	84
8	Awareness of correct medication usage	42	58
9	Knowledge of correct eye drop instillation technique	51	49
10	Understanding the importance of regular follow-up	21	79

[Table 1] summarizes the knowledge of participants regarding glaucoma and its management. The highest level of awareness was recorded for family history as a risk factor, acknowledged by 54% of respondents, followed by knowledge of correct eye drop instillation technique in 51% of participants. Awareness of the asymptomatic nature of glaucoma in early stages was present in 48% of cases, while correct medication usage was known to 42% of respondents. Knowledge of high intraocular pressure as a risk factor was identified in 39% of participants.

Recognition of irreversible vision loss associated with glaucoma was reported by only 34%, and 28% understood that treatment serves to control rather than cure the condition. Awareness that untreated glaucoma can lead to permanent vision loss was noted in merely 22% of participants. The lowest levels of awareness were recorded for the importance of regular follow-up (21%) and routine eye check-ups (16%), reflecting substantial gaps in patient knowledge across critical aspects of glaucoma management.

**Table 2: Attitude Toward Glaucoma (n = 100)**

Sr. No.	Attitude Questions	Yes (n)	No (n)
1	Belief that treatment can protect sight effectively	19	81
2	Willingness to attend regular doctor visits	24	76
3	Comfort in asking doctors questions about glaucoma	31	69
4	Belief in the importance of timely medication use	15	85
5	Belief that glaucoma requires lifelong care and monitoring	27	73
6	Worry about potential vision loss due to glaucoma	12	88
7	Concern regarding long-term treatment expenses	36	64
8	Belief that treatment adherence prevents blindness	22	78
9	Willingness to inform family members to undergo eye testing	18	82

[Table 2] presents the attitudes of participants toward glaucoma and its management. Concern regarding long-term treatment expenses was the most prevalent attitude, expressed by 36% of respondents. Approximately 31% of participants felt comfortable asking their physicians questions about their condition, while 27% acknowledged that glaucoma necessitates lifelong care and monitoring. Willingness to attend regular doctor visits was observed in only 24% of participants, and 22% believed that adherence to treatment could prevent blindness. The belief that treatment can effectively protect sight was held by only 19% of respondents,

while willingness to inform family members to undergo eye testing was reported in 18%. Recognition of the importance of timely medication use was noted in only 15% of participants, and merely 12% expressed concern about potential vision loss attributable to glaucoma. Overall, 48% of participants demonstrated poor attitude (scores < 25%), 27% had average attitude (25–50%), 17% demonstrated good attitude (50–75%), and 8% showed excellent attitude (> 75%). The findings collectively indicate a predominantly unfavourable attitude toward glaucoma management among the study population.

**Table 3: Practices Related to Glaucoma Management (n = 100)**

Sr. No.	Practice Questions	Yes (n)	No (n)
1	Uses prescribed eye drops regularly as advised	38	62
2	Misses scheduled follow-up appointments	59	41
3	Has stopped treatment without medical consultation	72	28
4	Undergoes regular eye check-ups as advised	43	57
5	Checks expiry date of medications before use	46	54
6	Washes hands before instilling eye drops	32	68
7	Follows correct eye drop instillation technique	49	51
8	Adheres to treatment without skipping doses	40	60

[Table 3] details the self-reported practices of participants regarding glaucoma management. The most concerning finding was that 72% of respondents reported discontinuing treatment without medical consultation, representing the most prevalent adverse practice in the study cohort. Missing scheduled follow-up appointments was reported by 59% of participants, while correct eye drop instillation technique was followed by 49% of respondents. Checking medication expiry dates before use was practiced by 46% of participants, and regular eye check-ups were undertaken by 43%. Adherence to

treatment without skipping doses was reported in 40% of cases, and regular use of prescribed eye drops was observed in 38% of respondents. Hand washing prior to eye drop instillation, an essential hygiene practice, was performed by only 32% of participants. Overall, 58% of participants demonstrated poor practices (< 25%), 24% had average practices (25–50%), 12% demonstrated good practices (50–75%), and 6% showed excellent practices (> 75%), indicating a predominantly deficient level of disease management behaviour across the study population.

**Table 4: Association Between Knowledge Level and Treatment Adherence**

Knowledge Category	Adherent n (%)	Non-Adherent n (%)	Chi-Square ( $\chi^2$ )	df	p-value
Good Knowledge (n=35)	15 (42.9%)	20 (57.1%)	0.046	1	0.831
Poor Knowledge (n=65)	25 (38.5%)	40 (61.5%)			

Statistically significant at  $p < 0.05$  (Chi-square test)

[Table 4] presents the association between knowledge level and treatment adherence. Among participants with good knowledge, 42.9% were adherent to treatment, compared with 38.5% among those with poor knowledge. The chi-square test revealed no statistically significant association

between knowledge level and treatment adherence ( $\chi^2 = 0.046$ ,  $df = 1$ ,  $p = 0.831$ ), suggesting that possessing adequate knowledge alone does not reliably translate into improved adherence behaviour in this population.

**Table 5: Association Between Knowledge Level and Attitude**

Knowledge Category	Positive Attitude n (%)	Negative Attitude n (%)	Chi-Square ( $\chi^2$ )	df	p-value
Good Knowledge (n=35)	14 (40.0%)	21 (60.0%)	3.892	1	0.048*
Poor Knowledge (n=65)	9 (13.8%)	56 (86.2%)			

Statistically significant at  $p < 0.05$  (Chi-square test)

[Table 5] presents the association between knowledge level and attitude toward glaucoma management. Among participants with good knowledge, 40.0% demonstrated a positive attitude, compared with only 13.8% among those with poor knowledge. A statistically significant association was observed between knowledge level and attitude ( $\chi^2 =$

3.892,  $df = 1$ ,  $p = 0.048$ ), indicating that better knowledge was significantly associated with a more favourable attitude toward glaucoma management. These findings suggest that targeted educational interventions aimed at improving patient knowledge may contribute to improved attitudinal outcomes.

**Table 6: Association Between Attitude and Follow-up Practice**

Attitude Category	Regular Follow-up n (%)	Irregular Follow-up n (%)	Chi-Square ( $\chi^2$ )	df	p-value
Positive Attitude (n=23)	12 (52.2%)	11 (47.8%)	2.145	1	0.143
Negative Attitude (n=77)	29 (37.7%)	48 (62.3%)			

Statistically significant at  $p < 0.05$  (Chi-square test)

[Table 6] presents the association between attitude and follow-up practice among participants. Among those with a positive attitude, 52.2% maintained regular follow-up appointments, compared with 37.7% among participants with a negative attitude. Despite this observable trend, the association between attitude and follow-up practice did not reach statistical significance ( $\chi^2 = 2.145$ ,  $df = 1$ ,  $p = 0.143$ ), indicating that a favourable attitude, while directionally associated with better follow-up behaviour, was not a statistically independent predictor of regular follow-up in this study cohort.

## DISCUSSION

The present study assessed the knowledge, attitudes, and practices (KAP) regarding glaucoma among elderly patients attending a tertiary care hospital. Despite all participants having a prior diagnosis of glaucoma and being on treatment, substantial deficiencies were observed across all three domains, indicating persistent gaps in disease awareness, perception of therapy, and self-management behaviors. These findings are clinically important, as glaucoma is a chronic, progressive, and irreversible optic neuropathy requiring lifelong treatment and strict follow-up to prevent avoidable visual impairment.

Knowledge regarding glaucoma was found to be inadequate in the majority of participants. Although 54% recognized family history as a risk factor and 51% were aware of correct eye-drop instillation technique, awareness of essential aspects of the disease remained poor. Only 22% were aware that untreated glaucoma can lead to permanent vision loss, 21% understood the importance of regular follow-up, and merely 16% were aware of the need for routine eye examinations. Furthermore, only 28% recognized that glaucoma treatment controls disease progression rather than curing it. These findings are consistent with previous studies by Dandona R et al,<sup>[12]</sup> and Krishnaiah S et al,<sup>[13]</sup> who reported similarly low levels of glaucoma awareness in Indian populations. Comparable deficiencies were also reported by Ichhpujani P et al,<sup>[5]</sup> and Alemu DS et al,<sup>[4]</sup> highlighting poor understanding of disease chronicity and long-term management. The observed low knowledge levels may be attributed to inadequate

patient counselling, limited health literacy, and the asymptomatic nature of early glaucoma, which often leads to underestimation of disease severity.

Attitudes toward glaucoma management were also predominantly unfavorable. Only 19% believed that treatment could preserve vision, 24% were willing to attend regular follow-up visits, and 22% believed that adherence to therapy prevents blindness. Concern regarding long-term treatment costs was reported by 36% of participants, making it the most common attitude-related barrier. Overall, 48% of participants demonstrated poor attitude scores, while only 8% exhibited excellent attitudes. These findings are in agreement with Ashwini G et al,<sup>[3]</sup> who emphasized that inadequate counselling and insufficient disease understanding contribute significantly to negative perceptions regarding glaucoma management. The unfavorable attitudes observed in this study may reflect misconceptions regarding lifelong therapy, fear of progressive vision loss, and financial burden associated with chronic treatment.

Practice-related findings were particularly concerning, as a large proportion of participants demonstrated poor adherence behaviors that could directly impact disease progression. Treatment discontinuation without medical consultation was reported by 72% of participants, while 59% missed scheduled follow-up visits. Only 38% used prescribed medications regularly, and 40% adhered to treatment without skipping doses. Hand hygiene before eye-drop instillation was practiced by only 32% of participants. Overall, 58% demonstrated poor practice scores. These findings are consistent with Spaeth G et al,<sup>[9]</sup> who highlighted poor compliance as a major determinant of unfavorable glaucoma outcomes. In elderly patients, poor practices may be influenced by forgetfulness, treatment fatigue, financial constraints, physical dependency, and comorbid illnesses, all of which can adversely affect long-term disease control.

The present study further demonstrated no statistically significant association between knowledge and treatment adherence ( $p = 0.831$ ), suggesting that knowledge alone is insufficient to ensure compliance with glaucoma therapy. However, a statistically significant association was observed between knowledge and attitude ( $p = 0.048$ ), indicating that better awareness positively influences

patients' perceptions and acceptance of disease management. Similar findings have been reported by Rewri P et al,<sup>[14]</sup> who observed improved attitudes among individuals with higher educational status and better disease awareness. The association between attitude and follow-up practice was not statistically significant ( $p = 0.143$ ), although a favorable trend was noted. This suggests that multiple external barriers such as transportation difficulties, financial limitations, caregiver dependence, and comorbid conditions may influence follow-up behavior in elderly patients.

## CONCLUSION

The present study sheds light on the knowledge, attitudes, and practices regarding glaucoma among elderly patients attending a tertiary care hospital. Despite being diagnosed cases on treatment, participants demonstrated inadequate knowledge of key aspects of glaucoma, particularly its irreversible nature, necessity for lifelong follow-up, and importance of routine eye examinations. Attitudes toward glaucoma management were predominantly unfavorable, with limited confidence in treatment effectiveness, poor willingness to attend regular follow-ups, and inadequate recognition of the importance of adherence, as reflected by a high proportion of poor attitude scores. Similarly, glaucoma-related practices were suboptimal, with frequent treatment discontinuation, irregular follow-up attendance, and poor medication adherence observed in a majority of participants. Although a statistically significant association was found between knowledge and attitude ( $\chi^2 = 3.892$ ,  $p = 0.048$ ), no significant association was observed between knowledge and treatment adherence or between attitude and follow-up behavior, indicating that patient behavior is influenced by multiple behavioral, social, and systemic determinants beyond awareness alone. Overall, the study highlights important gaps in glaucoma-related awareness and self-care practices among elderly patients, emphasizing the need for structured patient education, repeated counselling, family engagement, and integrated adherence-support strategies to improve long-term disease control and reduce glaucoma-related visual impairment and blindness.

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