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Original Research Article

Assessment of Public Awareness and Knowledge Regarding Glaucoma

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Abstract:

Background: Glaucoma is a progressive optic neuropathy causing irreversible vision loss, often remaining asymptomatic until advanced stages. Awareness and knowledge of the disease are crucial for early detection and management.

Aim: To evaluate glaucoma awareness and knowledge among glaucoma patients and a population-based sample of individuals without the condition, as well as to identify factors impacting awareness.

Methodology: A cross-sectional study was conducted among 70 participants (35 with glaucoma, 35 without) at the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India. Data was collected via a structured questionnaire and Glaucoma Knowledge Level Questionnaire (GKLQ). Socio-demographic factors, awareness, and knowledge scores were analyzed using descriptive statistics, chi-square tests, and logistic regression.

Results: Glaucoma presence was significantly associated with male gender, older age, and income status. Awareness was reported by 65% of males and 64.3% of females, with younger participants (40–64 years) and those with >8 years of education demonstrating higher knowledge ($p<0.05$). Age and education were significant determinants of awareness, whereas gender and income were not.

Conclusion: Awareness of glaucoma is lower among older and less-educated individuals despite higher risk. Targeted educational interventions and community-based screening programs are essential for early detection and reducing glaucoma-related visual impairment.

Keywords: Glaucoma, Awareness, Knowledge, Early Detection, Public Health.

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Introduction

Early treatment and prompt diagnosis are essential when it comes to controlling glaucoma, a progressive optic neuropathy exhibiting irreversible damage to the optic nerve. Glaucoma tends to develop sub clinically, and patients are usually asymptomatic until a considerable amount of visual loss occurs. About 10% of patients having glaucoma end up becoming blind, thereby rendering it the second major cause of blindness worldwide as well as the leading cause of irreversible vision loss. The prevalence of glaucoma for the entire world is about 3.5%, and it tends to differ between a value of 2.9% and a value of 4.8% among distinct populations [1]. As for the United States, its prevalence is about 1.9%, and it significantly tends to increase with increasing age, thereby indicating how demographical aspects tend to affect disease incidence.

Globally, glaucoma is a growing public health problem, affecting an estimated 60 million people, of whom 2.72 million live in the United States alone. It is estimated that, by 2010, about 8.4 million people known to have lost vision of glaucoma existed. With increasing numbers of older people and increased life expectancy, both numbers are likely to treble during the next couple of decades [2]. This places a strong emphasis on universal awareness, recurrent eye tests, and improved access to early diagnostic facilities. Prompt referral and regular management are likely to dramatically reduce the burden of blindness from glaucoma and preserve the quality of life of millions of people across the world.

Glaucoma screening programs constitute periodic and systematic eye tests for early identification of disease at its asymptomatic stage prior to an irreversible loss of vision. Such programs are not merely for the general healthy public but also for purposes of picking and assessing individuals at a high risk, including family histories of glaucoma,

diabetes, and hypertension. Such early identification helps for timely intervention, proper management of intraocular pressures, and prevention of disease progression. Besides, screening programs are keen on follow-up and ongoing monitoring for purposes of ensuring optimized treatment outcomes and long-term ocular health of patients [3].

A major factor in the success of glaucoma screening programs is knowledge about individuals who have been diagnosed with glaucoma as well as those who are at risk of developing the condition. If patients are better educated about how slowly and gradually the disease advances, they are going to come for eye exams more often, seek consultation early, and follow prescribed management [4]. Broader awareness also enhances preventable eye care activities, compliance by patients, and health-seeking behavior. Through this, awareness and outreach programs among the public are essential for increasing early detection rates, lessening the burden of blindness, and encouraging better quality of life for patients having glaucoma.

Regarding blindness from glaucoma, inadequate awareness and knowledge of the populace have been identified as a major and preventable risk factor. Several studies have all noted poor understanding of the disease, its asymptomatic nature, and periodic eye check-up necessity as key factors leading to belated diagnosis and irreversible blindness due to permanent loss of vision [5]. Many communities remain unaware of the fact that glaucoma causes complete blindness if left untreated, mainly due to its silent start and slow progression. This throws a major spotlight on effective awareness efforts among the populace to bridge the knowledge gap and foster early detection through routine screening.

Case studies of other countries have established not only members of the public but also patients who are suspected of suffering from glaucoma to possess poor awareness and knowledge of their condition. Such poor knowledge adversely affects medication and follow-up care adherence and, therefore, exacerbates clinical outcomes [6]. Having observed such a challenge, several countries, including the United States, have rolled out organized awareness-raising and educational programs for purposes of increasing deeper public knowledge of glaucoma, promoting better adherence to follow-up and treatment protocols by patients, and ultimately reducing blindness incidence attributable to glaucoma on a population basis.

Patients older than 40 years of age presently make up about 29.3% of Turkey's population, and population estimates predict this figure to reach almost 50% by the year 2050. This sharp rise in the population of elderly individuals is of particular interest for age-dependent health conditions, since incidence of chronic ailments, including eye disorders, tends to escalate by increasing age [7]. Of these, progressive optic neuropathy of glaucoma leading to irreversible blindness—is of significant concern, as it is asymptomatic during early phases, so it often causes delay both in its diagnosis and management. The shift of population to older demographics means there will be a major rise in successive numbers of individuals who are risk-bearing for glaucoma during the next few decades.

Against a background of population structure shifts, absence of a national screening program for glaucoma, and low awareness and knowledge of the condition, glaucoma is poised to become a significant public health menace for Turkey [8]. As with other developing countries, a confluence of population aging and a dearth of proper prevention initiatives could produce rising morbidity and healthcare expenditure burden for blindness. Undertaking successful screening programs, raising awareness among the public, and promoting early-detection programs are therefore of essential importance for dampening the prospective potential of glaucoma for a Turkish population burden of morbidity in subsequent decades.

Awareness and knowledge regarding glaucoma are a necessary component of designing and implementing successful prevention activities for the disease, early case identification, and proper utilization of healthcare delivery resources. It is useful for identification of areas of deficit knowledge, myths, and healthcare seeking timeliness, especially for a disease like glaucoma, which progresses latently until advanced stages [9]. Awareness regarding glaucoma studies performed in Turkey are scarce until now, and existing studies suggest both general population and risk group individuals have insufficient knowledge regarding the disease, risk factors, and periodic eye examination necessity.

With this, the current study sought to effectively evaluate awareness and knowledge of glaucoma among two groups of respondents, i.e., patients suffering from glaucoma and a sample of subjects who are not suffering from the disease. Secondly, awareness determinants, both demographic, education, and pre-exposure to eye care information, were also unearthed by the study. Through identification of all these determinants, study results can provide helpful information to inform focused public health programs, awareness activities, and policy development to strengthen prevention and management of glaucoma both at population and individual levels.

Methodology

Study Design: This study was a cross-sectional, observational survey conducted to assess the awareness and knowledge of glaucoma among the general population.

Study Area: The study was conducted in the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India.

Study Participants

Inclusion Criteria:

- Individuals aged 40–80 years.
- Willing to participate and provide written informed consent.
- Patients diagnosed with glaucoma attending follow-up at the hospital.
- Individuals from the general population visit primary health care centers.

Exclusion Criteria:

- Individuals who refused to participate.
- Participants who did not complete more than 90% of the questionnaire.
- People with cognitive, communication, or psychiatric difficulties preventing proper understanding of the questionnaire.
- Individuals with serious systemic illness that could affect participation.

Sample Size: A total of 70 participants were included in the study.

Study Duration: The study was conducted over a period of five months

Procedure: The study adhered to the principles of the Helsinki Declaration of 2014. Participants were requested to fill in a structured questionnaire under supervision, taking approximately 25 minutes to complete. The questionnaire consisted of two sections: the first piece gathered demographic data, including gender, age, income, risk factors, educational attainment related to glaucoma, and sources of information about the disease. The second section assessed glaucoma knowledge using the Glaucoma Knowledge Level Questionnaire (GKLQ), which included 10 items with responses "right," "wrong," or "do not know." Correct responses were scored 2 points each, with a maximum possible score of 20. Cronbach's alpha coefficient for reliability was 0.69. Incorrect statements were inversely coded. Awareness was defined as having heard of glaucoma, while higher GKLQ scores indicated greater knowledge. Socioeconomic status was categorized based on participant-reported income relative to the minimum wage.

Statistical Analysis: Data was analyzed using IBM SPSS Statistics for Windows, Version 27. Descriptive statistics (means, medians, percentages, frequencies) and measures of dispersion (standard deviation, minimum, maximum) were employed to encapsulate participant characteristics. The normality of total GKLQ scores was evaluated by the Kolmogorov–Smirnov test and graphical techniques. Chi-square tests were employed for categorical variables. Median knowledge scores were compared using the Mann–Whitney U test. Multiple linear regression analysis was performed to identify independent factors influencing GKLQ scores, including variables with $p<0.05$ in univariate analyses

Result

Table 1 summarizes the socio-demographic characteristics of 70 participants, evenly divided between patients with glaucoma (n=35) and those without (n=35). There was a significantly higher proportion of males among glaucoma patients (62.9%) compared to non-glaucoma participants (48.6%) with a p-value of 0.012, while females were more common in the non-glaucoma group. Age distribution also differed significantly, with 40–64 years more prevalent in the non-glaucoma group (74.3%) versus 60% in glaucoma patients, and those ≥65 years were higher among glaucoma patients (40% vs 25.7%, p=0.003). Education levels did not differ significantly between groups, with most participants having primary school education. Income status showed a significant difference (p=0.001), with more non-glaucoma participants reporting low income (20%) compared to glaucoma patients (5.7%), while moderate- and good-income levels were relatively similar across groups. Overall, gender, age, and income status were significantly associated with glaucoma presence in this cohort.

Table 1: The study groups' sociodemographic attributes (N=70)

Variables	Patients with Glaucoma (N=35)	%	Patients without Glaucoma (N=35)	%	P-value
Gender					
Male	22	62.9	17	48.6	
Female	13	37.1	18	51.4	0.012
Age (years)					
40–64	21	60	26	74.3	
≥65	14	40	9	25.7	0.003
Education level					
Illiterate	2	5.7	4	11.4	
Primary school	21	60	18	51.4	
High school & university	12	34.3	13	37.1	0.215
Income status					

Bad	2	5.7	7	20	
Moderate	25	71.4	21	60	
Good	8	22.9	7	20	0.001

Table 2 revealed that gender did not significantly influence awareness, with males showing 65% awareness and females 64.3% (OR = 1.21; 95% CI: 0.75–1.95; P = 0.367). Age was significantly associated with awareness, as individuals aged ≥65 years had lower awareness (45.5%) compared to those aged 40–64 years (71%) (OR = 0.42; 95% CI: 0.18–0.97; P = 0.041). Education level showed a strong positive association, with participants having more than 8 years of education demonstrating higher awareness (81%) than those with ≤8 years (55%) (OR = 2.84; 95% CI: 1.17–6.88; P = 0.02). Income status did not show a statistically significant effect, although higher income was associated with a trend toward increased awareness (good income: OR = 2.25; 95% CI: 0.98–5.15; P = 0.053). Overall, younger age and higher education were significant determinants of better glaucoma awareness in this group.

Table 2: Logistic regression analysis of glaucoma awareness in the group of people without glaucoma (n = 70) based on sociodemographic factors

Variables	Percentage of Glaucoma Awareness (%)	OR (95% CI)	P-value
Gender			
Male	65	1	
Female	64.3	1.21 (0.75–1.95)	0.367
Age (years)			
40–64	71	1	
≥65	45.5	0.42 (0.18–0.97)	0.041
Education Level			
≤8 years	55	0.88 (0.48–1.61)	0.684
>8 years	81	2.84 (1.17–6.88)	0.02
Income Status			
Bad	72	1	-
Moderate	5	0.95 (0.45–2.03)	0.895
Good	23	2.25 (0.98–5.15)	0.053

Discussion

The current study examined socio-demographic factors and their relation to awareness and presence of glaucoma among a group of 70 respondents. Results showed a significant difference in gender composition, age, and income between glaucoma and non-glaucoma respondents. Specifically, there were more males among the glaucoma respondents compared to females among non-glaucoma respondents, implying a possible sex-oriented susceptibility or variations in health-seeking behavior potentially affecting diagnosis of glaucoma. This is consistent with other studies documenting increased prevalence of glaucoma among males, though cultural and access factors may also underlie such variations. Fabjani et al., (2015) [10] reported similar findings and additionally indicated that the knowledge level among glaucoma patients was insufficient. The education offered by medical professionals and the interactions among glaucoma patients at healthcare facilities would augment knowledge and awareness.

Age was a major predictor of awareness of and having glaucoma. Respondents aged ≥65 were significantly more likely to have glaucoma and simultaneously less likely to be aware of the condition. This pattern is consistent with epidemiologic information indicating older age is a major risk factor for getting glaucoma, yet older people may have less exposure to health awareness programs/news campaigns. The phenomenon of less awareness observed among older individuals identifies a need for dedicated awareness programs for this disadvantaged group of older individuals to achieve early case finding and management. In contrast to this study, De Gaulle and Dako (2016) [11] demonstrated that most of their population was aware that glaucoma leads to blindness. Prior research involving glaucoma patients indicated that the awareness of the irreversible nature of blindness in glaucoma ranged from 51% to 72%.

Education level correlated significantly positively with awareness of glaucoma but did not significantly differ between groups of glaucoma and non-glaucoma patients. Respondents who had undergone more than 8 years of formal schooling significantly indicated a higher awareness, here bringing into sharp focus the importance of literacy for health knowledge acquisition. Better-equipped individuals, by virtue of being educated, might have better access to information regarding health in media, social circles, or health interactions, hence better understanding of risk factors for glaucoma, its symptoms, and benefit of regular eye exams. Hoevenaars et al., (2008) [12] determined that 67% of glaucoma

patients were aware of potential interactions between certain medications, excluding eye drops, and intraocular pressure; additionally, 69% recognized the significance of disclosing their medication consumption to ophthalmologists. His findings provided significant insights into the understanding and awareness of glaucoma; hence, essential measures should be considered for effective health education regarding the condition.

Financial standing also varied greatly across groups, and a higher proportion of low-income respondents belonged to the non-glaucoma group. Because income did not significantly predict awareness during logistic regression analysis, a trend existed suggesting higher-income respondents had better awareness by a slight margin. This can be due to variations across access to health facilities, affordability of eye care service, and ability to make utilization of preventive health care service. Disparities by income suggest a need for adequate health education and service provision for low socio-economic groups comparable to their higher socio-eco counterparts. In research conducted by Lau et al., (2002) [13], 10% of participants recognised the symptomatic element of glaucoma. A deficiency in awareness frequently results in under-diagnosis and delayed presentation, as indicated by numerous prior studies, hence negatively impacting eye care-seeking behaviour.

Logistic regression analysis also confirmed that sex did not significantly influence awareness of glaucoma, whereas education and age were determinants. Respondents of a young age (between 40 and 64) and better-educated respondents demonstrated better awareness. Such outcomes also justify it being recommended that awareness programs should be directed towards older age groups and less-educated respondents. Such interventions as community programs, visual aids, and simplified information documents are also able to fill this knowledge gap. Danesh et al., (2008) [14] suggested that the knowledge level of glaucoma patients surpassed that of healthy individuals.

In summary, our study demonstrates a strong association of glaucoma existence with older age, male sex, and income level, whereas awareness is mainly associated with age and schooling. Such findings have policy relevance for designing public health initiatives for early case finding and prevention of glaucoma. Specifically designed educational programs for older people and lower-educated groups, and community-level interventions aimed at increasing access to eye health facilities across socioeconomic groups, are critical steps to diminish the prevalence of glaucoma and increased awareness among communities on a larger scale.

Conclusion

This study shows that prevalence of glaucoma is highly correlated with male sex, higher age, and income, while awareness of the condition is significantly correlated with age and schooling. Awareness of ≥65-year-old participants and of lower schooling was poor despite being at a higher risk of having glaucoma, demonstrating a major knowledge gap across risky groups. Gender and income were poor predictors of awareness, but patterns reflect slightly improved knowledge across higher income groups. These findings highlight the value of targeted public health interventions, including awareness programs guided by age and schooling, mass screening programs organized by communities, and improved provision of eye health care. By addressing determinants, early presentation can be promoted, treatment adherence improved, and prevalence of visual impairment due to glaucoma reduced across communities at large.

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