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Original Research Article

Awareness and knowledge of glaucoma among the patients attending a tertiary eye hospital with and without glaucoma diagnosis

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ABSTRACT

Background: Glaucoma, a leading cause of irreversible blindness, remains under-recognized in many regions, including Bangladesh. This study aimed to assess the awareness and knowledge of glaucoma among the patients attending a tertiary eye hospital with and without glaucoma diagnosis.
Methods: This cross-sectional study was conducted on 300 individuals attending deep eye care foundation, Rangpur, from April 2023 to September 2023. Informed consent was obtained from eligible participants over 18 years. The questionnaire, available in both English and Bengali, collected demographic data and included questions on glaucoma awareness and knowledge. Data were analysed using SPSS 25, and the chi-square test was applied to determine statistical significance.
Results: Among the participants, 34.7% had heard of glaucoma, with doctors/hospitals being the primary source of information. Awareness varied significantly based on age, residency, education, occupation, and income levels. Among those aware of glaucoma, 59.6% had poor knowledge, 33.7% had average knowledge, and only 6.7% had good knowledge. No significant association was found between glaucoma patients and non-glaucoma patients regarding knowledge level.
Conclusions: This study revealed a substantial gap in glaucoma awareness and knowledge in Bangladesh. While a notable portion of the population had heard of glaucoma, their understanding of the condition was limited, emphasizing the need for targeted awareness campaigns and improved access to eye care services. Addressing these gaps is crucial for early diagnosis, treatment, and preventing irreversible blindness while reducing the economic burden associated with glaucoma-related healthcare costs

Keywords: Awareness, Knowledge, Glaucoma, Cross sectional study

INTRODUCTION

Glaucoma is a chronic and progressive optic neuropathy characterized by specific changes in the optic disc and visual field defects, often associated with elevated intraocular pressure (IOP).[1] It ranks as the second leading cause of blindness globally, following cataracts, and stands as the primary cause of irreversible blindness worldwide. Unfortunately, it is frequently diagnosed at an advanced stage, resulting in significant eye damage.[2] Early detection and treatment can prevent permanent blindness, but a lack of awareness and inadequate screening tools contribute to delayed diagnosis, even among educated individuals.[3] Studies have indicated that a substantial percentage of glaucoma cases, ranging from 50% to 90%, go undiagnosed.[4] The main culprit behind delayed glaucoma diagnosis is often a lack of awareness, which significantly increases the risk of glaucoma-related blindness.[2,3] Socioeconomic factors, including education levels, family history, access to entertainment, and exposure to public health education efforts by government

or non-governmental organizations (NGOs), influence the level of awareness.[4]

Insufficient awareness not only impacts the timing of diagnosis but also hinders the utilization of eye care services.[5] Glaucoma-related blindness imposes substantial financial burdens on affected individuals and healthcare systems, reducing the overall quality of life and increasing the cost of recovery, which, in turn, affects a nation's economic development.[6] The most significant risk factors for glaucoma include advanced age, elevated IOP, familial predisposition, and ethnicity.[1] Treatment usually involves IOP-lowering medications such as beta-blockers, prostaglandin analogues, and carbonic anhydrase inhibitors. However, the effectiveness of these drugs in halting glaucoma progression is sometimes uncertain.[6] Surgical interventions like laser trabeculoplasty and trabeculectomy become options when medical treatment fails.[7] Unfortunately, glaucoma diagnoses typically occur in advanced stages, leading to substantial visual impairment.[8]

Therefore, assessing awareness and knowledge levels is essential for developing effective information, education, and communication models and devising new strategies to raise glaucoma awareness. Increased awareness encourages individuals to seek regular eye examinations and helps reduce the economic burden of this disease.[3,5] This study was designed to evaluate the extent of awareness and knowledge regarding glaucoma among the patients with and without glaucoma diagnosis using a questionnaire survey, aiming to develop targeted strategies against this vision-threatening condition.

METHODS

This cross-sectional hospital-based study was conducted from April 2023 to September 2023 at deep eye care foundation in Rangpur. The study enrolled 300 individuals who attended the facility. Informed consent was obtained from all eligible participants. The institutional ethics committee of deep eye care foundation granted ethical approval for the study. Inclusion criteria included patients over 18 years of age who provided informed written consent to participate. Patients who were severely ill, unwilling to participate, under the age of 18, or mentally unstable were excluded from the study.

A structured questionnaire was developed in English and translated into the local language, Bangla, to ensure ease of understanding. Data collection through the questionnaire was conducted before participants entered the ophthalmologist's examination room. Following the collection of demographic data, participants were asked awareness-related questions, including inquiries about medical history (e.g., history of DM and HTN), history of eye examination, and family history of glaucoma, as well as their sources of information. Awareness was assessed by asking participants, "Have you ever heard of the term 'glaucoma'?"

Knowledge details were only obtained from patients who were aware of glaucoma. Knowledge was assessed by questioning participants about the altered anatomical site, different types, clinical presentation, risk factors, association with high IOP and visual field, and treatment options for glaucoma. This survey was conducted by doctors, optometrists, and reactionists who were trained on the questionnaire and had extensive knowledge about glaucoma.

The obtained data were entered into a Microsoft excel spreadsheet and analysed using SPSS version 25. The Chi-square test was applied, with a significance level set at $p<0.05$.

RESULTS

In this study, a total of 300 participants were interviewed during the study period. The age of participants ranged between 18 and 85 years with mean age of 43.9±15.4 years (Table 1). Regarding gender, the study had almost equal representation, with 50.7% male participants and 49.3% female participants. In terms of residency, 49.0% of the patients lived in urban areas, while 51.0% resided in rural areas. Educational background of participants varied significantly. Participants had diverse educational backgrounds, with 22.3% having completed secondary education, 19% having no formal education, and 15.3% holding graduate degrees. Occupations ranged from day labour (2%) to service holder (18.3%), and majority (53.7%) had a monthly income below 20,000 Bangladeshi Taka (Table 2). In terms of medical history, 20% (60) of participants had a history of hypertension, 13.7% (41) had history of diabetes, and 15.3% (46) history of glaucoma. Additionally, 8.6% (26) had positive family history of glaucoma. When asked if they had ever heard of term glaucoma before 34.7% (104) responded affirmatively, while 65.3% had not. Among those who had heard of glaucoma, 86.5% knew that it is eye disease (Table 3).

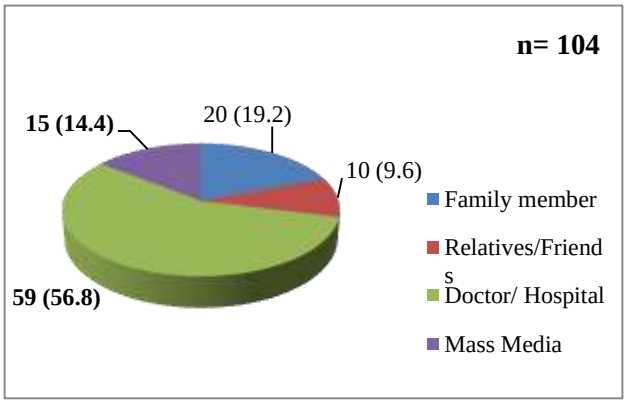

Figure 1: Source of information who were aware about glaucoma.

For those who were aware of glaucoma, the primary source of information was doctors/hospitals (56.8%), followed by family members (19.2%), relatives/friends (9.6%), and

mass media (14.4%) (Figure 1). Further analysis showed no significant differences in glaucoma awareness based on gender. However, awareness varied significantly across age groups, with the youngest age group (18-39 years) having the highest awareness. Urban residents were more aware of glaucoma than rural residents. Educational level was strongly associated with awareness, with higher education levels corresponding to higher awareness (p≤0.001). Occupation also played a significant role in awareness, with service holders having the highest awareness (p≤0.001). Monthly income was associated with awareness, with higher income individuals having greater awareness (p≤0.001) (Table 4). Among those who were aware of glaucoma (n=104), the mean knowledge score was 6.6 out of a maximum of 13, with 59.6% having poor knowledge, 33.7% having average knowledge, and 6.7% having good knowledge about glaucoma (Table 5). There was no significant association found between glaucoma patients and non-glaucoma patients with their level of knowledge (p=0.570) (Table 6). Table 7 presents frequency of responses regarding basic glaucoma knowledge among participants who aware of glaucoma.

Table 1: Distribution of age group of the respondents.

Age group (in years)	N	Percentage (%)	
18-39	120	40.0	Mean± SD= 43.9±15.4, minimum=18, maximum=85
40-49	66	22.0	
50-59	54	18.0	
60 and above	60	20.0	
Total	300	100.0	

Table 2: Socio-demographic criteria of the respondents.

Variables	N	Percentage (%)
Sex		
Male	152	50.7
Female	148	49.3
Area of resident		
Urban	147	49.0
Rural	153	51.0
Education		
No formal education	57	19.0
Primary education	44	14.7
Secondary education	67	22.3
Higher secondary	45	15.0
Graduate	46	15.3
Post-graduate	41	13.7
Occupation		
Unemployed	25	8.3
Retired	17	5.7
Farmer	52	17.3
Business	50	16.7
Day labor	6	2.0
Service holder	55	18.3
Home maker	54	18.0
Student	28	9.3
Others	13	4.3
Monthly income (BDT)		
<20000	161	53.7
20001-30000	52	17.3
30001-40000	24	8.0
40001-50000	26	8.7
>50000	37	12.3
Total	300	100

Table 3: History of glaucoma and other diseases with awareness on glaucoma.

Variables	Yes, N (%)	No, N (%)
History of hypertension	60 (20.0)	240 (80.0)
History of diabetes	41 (13.7)	259 (86.3)
History of glaucoma (Diagnosed glaucoma patients)	46 (15.3)	254 (84.7)
Positive history of glaucoma in family	26 (8.6)	274 (91.4)

Continued.

Variables	Yes, N (%)	No, N (%)
Have you ever heard of the term "glaucoma" before?	104 (34.6)	196 (65.4)
Do you know that glaucoma is an eye disease? (n=104)	90 (86.5)	14 (13.5)

Table 4: Association of awareness of glaucoma with socio-demographic factors.

Variables	Aware	Not aware	Total	P value
Sex				
Male	53	99	152	0.941
Female	51	97	148	
Age group (in years)				
18-39	47	73	120	0.05
40-49	24	42	66	
50-59	10	44	54	
60 and above	23	37	60	
Area of resident				
Urban	65	82	147	0.001
Rural	39	114	153	
Education				
No formal education	6	51	57	<0.001
Primary education	12	32	44	
Secondary education	15	52	67	
Higher secondary	17	28	45	
Graduate	24	22	46	
Post-graduate	30	11	41	
Occupation				
Unemployed	11	14	25	<0.001
Retired	8	9	17	
Farmer	4	48	52	
Business	12	38	50	
Day labor	1	5	6	
Service holder	30	25	55	
Home maker	19	35	54	
Student	11	17	28	
Others	8	5	13	
Monthly income (BDT)				
<20000	38	123	161	<0.001
20001-30000	19	33	52	
30001-40000	10	14	24	
40001-50000	12	14	26	
>50000	25	12	37	
Total	104	196	300	

Table 5: Knowledge level among the respondents who were aware of glaucoma, (n=104).

Degree of level	Knowledge			
	Poor, <50%	**Average, 50%-75%**	**Good, >75%**	Mean±SD=6.6±3.74, minimum=2, maximum=13
Number	62	35	7	
Percentage (%)	59.6	33.7	6.7	

Table 6: Association between glaucoma and non-glaucoma patients with their level of knowledge (n=104).

Patients with and without glaucoma diagnosis	Level of knowledge				P value
	Poor, <50%	**Average, 50%-75%**	**Good, >75%**	**Total, N (%)**	
Glaucoma patients	25 (54.3)	18 (39.1)	3 (6.5)	46 (100.0)	0.570
Non-glaucoma patients	37 (63.8)	17 (29.3)	4 (6.9)	58 (100.0)	
Total	62 (59.6)	35 (33.7)	7 (6.7)	104 (100.0)	

Table 7: Frequency of responses regarding basic glaucoma knowledge.

Questions	N (%)
Altered anatomical site in glaucoma	
Retina	3 (2.9)
Optic nerve*	34 (32.7)
Cornea	0 (0.0)
I don't know	67 (64.4)
Existence of different types of glaucoma	
Yes*	24 (23.0)
No/ I don't know	80 (77.0)
Glaucoma can occur without symptoms	
Yes*	29 (27.9)
No/ I don't know	75 (72.1)
Glaucoma is more common in people above 60 years	
Yes*	41 (39.4)
No/ I don't know	63 (60.6)
High IOP, family history and advanced age are glaucoma risk factors	
Yes*	49 (47.1)
No/ I don't know	55 (52.9)
Associated with high IOP	
Yes	55 (52.9)
No	49 (47.1)
Not always	0 (0.0)
I don't know	0 (0.0)
Visual field is affected	
Yes	47 (45.2)
No/ I don't know	57 (54.8)
Glaucoma progresses over time	
Yes*	53 (51.0)
No/ I don't know	51 (49.0)
Glaucoma causes blindness	
Yes*	57 (51.0)
No/ I don't know	47 (49.0)
Glaucoma can be cured	
Yes/ I don't know	43 (41.3)
No*	61 (58.7)
Glaucoma has treatment	
Yes*	68 (65.4)
No/ I don't know	36 (34.6)
Available treatment options	
Drops, laser and surgery	44 (42.3)
I don't know	41 (39.4)
Drops and surgery	7 (6.7)
Only drops	11 (10.6)
Only surgery	1 (1.0)
Purpose of the treatment of glaucoma	
Regain vision	24 (23.0)
I don't know	51 (49.0)
Delay progression	17 (16.3)
Stop progression	12 (11.5)
Glaucoma treatment reduces IOP	
Yes*	52 (50.0)
No/ I don't know	52 (50.0)
Glaucoma damage is reversible	
Yes*	27 (26.0)
No/ I don't know	77 (74.0)

Continued.

Questions	N (%)
Glaucoma is inherited	
Yes*	33 (31.7)
No/ I don't know	71 (68.3)

*Correct answer.

DISCUSSION

Glaucoma, a leading cause of irreversible blindness, can be prevented with early diagnosis and treatment. Our cross-sectional study exhibited nearly equal representation, with 50.7% male and 49.3% female participants. Interestingly, we found that 19% of participants had no formal education, a statistic that mirrors findings from a study conducted by Lartey et al.[2]

In our study conducted in Bangladesh, we observed that 34.7% of participants had heard of the term "glaucoma," indicating a notable level of awareness within the population. However, a significant majority, comprising 65.3%, had not previously encountered this term. In stark contrast, a study by Tenkir et al.[8] among Southwestern Ethiopians reported remarkably low glaucoma awareness, with only 2.4% of participants indicating awareness of the condition. This substantial regional disparity underscores the significant influence of varying healthcare infrastructure and public health initiatives.

A study conducted in Bangladesh by Nasrin et al.[9] reported a higher awareness rate, with 50% of the study population being aware of glaucoma. Our study's 34.7% awareness rate aligns reasonably well with their findings, suggesting a certain level of consistency in glaucoma awareness within the country. In contrast, the study by Islam, also conducted in Bangladesh, revealed lower levels of glaucoma awareness (0.5%).[10] These differences may be attributed to factors such as the urban-rural divide or specific community characteristics. Conversely, the study by Becerril-Ledezma et al in Mexico reported a significantly higher general awareness proportion of 73.9%, indicating relatively high glaucoma awareness among Mexican patients.[11] In urban Chennai, Ramesh et al found an awareness level of 13.3%, while Mridula et al in a tier 2 city of South India, reported an awareness level of 4.8%.[12,13]

These variations illustrate the wide range of glaucoma awareness levels across different countries and regions, likely influenced by disparities in healthcare systems and public health efforts.

In summary, our study contributes significantly to understanding of glaucoma awareness and knowledge within the context of Bangladesh. These comparative findings emphasize the necessity of tailored awareness campaigns and improved access to eye care services, accounting for regional variations and unique socioeconomic factors influencing glaucoma awareness. Furthermore, our analysis showed no significant differences in glaucoma awareness based on gender, in contrast to findings from developed countries where males often exhibit lower awareness levels. Urban residents in our study more aware of glaucoma than rural residents. Education level, occupation, and monthly income were strongly associated with awareness, aligning with the demographic characteristics of the population.[14-17]

Additionally, the primary source of glaucoma awareness in our study was doctors or hospitals (56.8%), followed by family members with glaucoma and mass media. In contrast, in southern India, the most common source of glaucoma awareness was TV/magazines, followed by family members with glaucoma. Representative German population surveys indicated that friends were the most common source of awareness (44%), surpassing physicians (13%), a trend similarly observed in urban Indian populations.[18-20]

In our study, while we observed a moderate level of glaucoma awareness, we identified a notably low level of knowledge (6.7%) among individuals who were aware of condition. Comparing our findings to study by Becerril-Ledezma et al.[11] conducted in Mexico, we observed a similar trend, with both studies reporting a relatively low proportion of participants with good knowledge of glaucoma (15.5%). This suggests that, despite reasonable awareness levels, a significant gap in understanding glaucoma persists among patients in both settings.

Conversely, a study by Atebo et al.[21] in Australia reported a high awareness rate of 93%. However, even with such high awareness, only 29% of participants demonstrated some knowledge of glaucoma. Similarly, the study by S. Lartey et al found that 74% of participants were aware of glaucoma, but only 27% had some knowledge of its clinical presentation.[2] This finding aligns with our observation that a substantial proportion of individuals may be aware of glaucoma's existence but lack a deeper understanding of its clinical aspects.

Notably, our study did not identify any significant association between glaucoma patients and non-glaucoma patients regarding knowledge level. However, studies by Becerril-Ledezma et al and Celebi found higher knowledge scores among patients with glaucoma.[11,22]

In conclusion, our study highlights the importance of region-specific strategies to address the challenges of glaucoma awareness and knowledge. While glaucoma awareness can vary widely between countries and regions, our findings emphasize the need for targeted educational initiatives to bridge the gap between awareness and

understanding. These insights underscore the importance of comprehensive efforts to combat this potentially blinding disease effectively.

CONCLUSION

This study highlights a significant gap in glaucoma awareness and knowledge in Bangladesh. While a notable portion of the population has heard of glaucoma, their understanding of this vision-threatening condition is alarmingly limited, even among those aware of it. This underscores the urgent need for tailored awareness campaigns and improved access to eye care services, especially in regions with lower awareness levels. In summary, addressing glaucoma awareness and knowledge gaps is crucial for early diagnosis, treatment, and preventing irreversible blindness, while also reducing the economic burden associated with glaucoma-related healthcare costs.

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REFERENCES

1. Divya V, Suvarna G. Glaucoma awareness among patients at outpatient Department of Ophthalmology in Smt. Kashibai Navale medical college and general hospital, Narhe, Pune. Int J Sci Res. 2012:3(9):2319-7064.
2. Nkum G, Lartey S, Frimpong C, Micah F, Nkum B. Awareness and Knowledge of Glaucoma Among Adult Patients at the Eye Clinic of a Teaching Hospital. Ghana Med J. 2015;49(3):195-9.
3. Gupta S, Rishi P. Glaucoma awareness in undiagnosed literate individuals attending routine eye clinic at a tertiary care center. Indian J Clin Exp Ophthalmol. 2016;2(4):370-2.
4. Sandhya R, Sinha A, Shetty N. A Study of Awareness of Glaucoma among Ophthalmology out patients in a 2-Tier City, Tumkur. Indian J Clin Exp Ophthalmol. 2015;1(3):156-8.
5. Pamu PNJ, Priyanka CS. Assessment of knowledge, awareness on glaucoma among glaucoma patients and its impact on daily life. Int J Adv Res. 2019;7(2):374-8.
6. Priyadarshini R, Priye S, Chander A. To study glaucoma awareness, knowledge, attitude towards screening in patients of western Uttar Pradesh. Int J Med Ophthalmol. 2020;2(2):68-72.
7. Alqahtani SM, Bakarman MA, Almanjoumi A, Alzahrani SH. Awareness and knowledge about glaucoma among patients visiting the screening clinic in Jeddah Eye Hospital, Saudi Arabia. Int J Ophthalmol. 2021;14(6):887-95.
8. Tenkir A, Solomon B, Deribew A. Glaucoma awareness among people attending ophthalmic services in Southwestern Ethiopia. BMC Opthalmol. 2010;10:17.
9. Nasrin N, Asaduzzaman M, Sharmin D, Tithi N, Hudda S. A survey-based study on awareness of eye diseases among population of Bangladesh. Asian J Med Biological Res. 2020;5(4):292-6.
10. Islam S. Knowledge and Awareness of Glaucoma and associated Risk Factors in Urban Community. Science Open Preprints. 2020.
11. Becerril-Ledezma V, Alvarez-Ascencio D, Del Hierro-Gutiérrez CE, Hernandez-Oteyza A, Jiménez-Román J. Knowledge and awareness of glaucoma in Mexican patients with and without glaucoma diagnosis in an Ophthalmology Referral Center. Int J Ophthalmol. 2022;15(6):990-6.
12. Sathyamangalam RV, Paul PG, George R, Baskaran M, Hemamalini M, Madan RV, et al. Determinants of glaucoma awareness and knowledge in urban Chennai. Indian J Ophthalmol. 2009;57(5);355-60.
13. Prabhu M, Patil SH, Kangokar PR. Glaucoma awareness and knowledge in a tertiary care hospital in a tier-2 city in South India. J Sci Soc. 2013;40(1);3-8.
14. Maharana PK, Rai VG, Pattebahadur R, Singhi S, Chauhan AK. Awareness and knowledge of glaucoma in central India: a hospitalbased study. Asia Pac J Ophthalmol (Phila). 2017;6(3):243-9.
15. Kizor-Akaraiwe NN, Monye HI, Okeke S. Awareness and knowledge about glaucoma and proportion of people with glaucoma in an urban outreach programme in Southeast Nigeria. BMJ Open Ophthalmol. 2017;1(1):e000018.
16. Sood D, Sood S, Sood I, Kumar D, Sood R, Sood NN. Glaucoma awareness amongst glaucoma patients seeking a second opinion. Int Ophthalmol. 2018;38(4):1441-9.
17. De-Gaulle VF, Dako-Gyeke P. Glaucoma awareness, knowledge, perception of risk and eye screening behaviour among residents of Abokobi, Ghana. BMC Ophthalmol. 2016;16(1):204
18. 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;53:205-8.
19. Pfeiffer N, Krieglstein GK, Wellek S. Knowledge about glaucoma in the unselected population: A German survey. J Glaucoma. 2002;11:458-63.
20. Dandona R, Dandona L, John RK, McCarty CA, Rao GN. Awareness of eye diseases in an urban population in southern India. Bull World Health Organ. 2001;79:96-102.
21. Attebo K, Mitchell P. Knowledge and diseased about common eye diseases. Aust N Zeal J Ophthalmol. 1997;25(3):283-4.
22. Celebi ARC. Knowledge and Awareness of Glaucoma in Subjects with Glaucoma and their Normal First-Degree Relatives. Med Hypothesis Discov Innov Ophthalmol. 2018;7(1):40-7.

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