

Assessment of Knowledge Regarding Glaucoma among Patients at Sindh Institute of Ophthalmology and Visual Science (SIOVS) @ Eye Hospital Hyderabad

**Nirma Mashooque Ali Bhand¹, Nasreen Rebecca Wilson², Zafarullah Junejo³
Muhammad Hanif Bhand⁴, Suhail Ahmed Soomro⁵**

¹BSN Student, Isra School of Nursing, Isra University Hyderabad, Sindh, Pakistan.

²Principial, Isra School of Nursing, Isra University Hyderabad, Sindh, Pakistan.

³Nursing Lecturer, Isra School of Nursing, Isra University Hyderabad, Sindh, Pakistan.

⁴Pathology Lab Assistant, Institute of Ophthalmology, Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan.

⁵English Lecturer, Isra School of Nursing, Isra University Hyderabad, Sindh, Pakistan.

nirmamashooqueali@gmail.com, junejozafar856@gmail.com

DOI: 10.5281/zenodo.14028933

ABSTRACT

Glaucoma is a progressively neuropathic condition of the optic nerve and is estimated to affect about 80-million sufferers worldwide. Usually not noticeable until severe pathology becomes apparent and most dangerous for the people of Africans origin. The important risks factors include raised intraocular pressure, age and family history. However, they still continue not knowing that they have the disease; the majority develops the disease to blindness level when diagnosed. This study aimed to assess the level of knowledge regarding glaucoma among patients at Sindh Institute of Ophthalmology and Visual Science (SIOVS) at Eye Hospital, Hyderabad. A descriptive cross-sectional study was conducted using a self-administered questionnaire. 60 patients were selected through non-probability convenience sampling, and data were analyzed using SPSS version 23. The study revealed that of the participants 88.0% had a college education and a slightly higher number (61.7%) of the participants were female. Education status indicated that, 38.3% of the people had attained secondary education, while 28.3% did not attend any form of education. Occupationally, 33.3 % were student while 10.0% were employed. Here, 73.3% of participants reported having an idea of glaucoma; however, only 28.3% of the participants stated that vision loss may occur without experiencing any pain; hence participants revealed large gaps in their knowledge. Only 60% respondents knew the risk factors while 48.3% had never had their eyes checked. However, 80.0% of the respondents believed that glaucoma can be treated and 83.3% supported early management of glaucoma. The study concluded that patients displayed poor knowledge about the glaucoma, and were unable to identify important symptoms and risk factors associated with it. Further, some patients assumed that glaucoma can be managed with early diagnosis and treatment, overall level of knowledge was poor.

Keywords: Glaucoma, Knowledge Assessment, Visual Field Defects, Eye Care, Intraocular Pressure.

Cite as: Nirma Mashooque Ali Bhand, Nasreen Rebecca Wilson, Zafarullah Junejo, Muhammad Hanif Bhand, & Suhail Ahmed Soomro. (2024). Assessment of Knowledge Regarding Glaucoma among Patients at Sindh Institute of Ophthalmology and Visual Science (SIOVS) @ Eye Hospital Hyderabad. *Mader E Milat International Journal of Nursing and Allied Sciences (MINAS)*, 2(3), 11–21. <https://doi.org/10.5281/zenodo.14028933>

INTRODUCTION

Glaucoma is defined as a group of diseases that result in progressive optic neuropathy with loss of retinal ganglion cells and subsequent visual field defect (Fernández-Albarral et al., 2024). It is commonly called as the “silent thief of sight” by virtue of featuring minimal signs and symptoms despite it having already progressed to significant blindness (Dhawale & Tidake, 2024). Glaucoma is one of the most important global health problems with about 80 million individuals affected and being one of leading causes of irreversible blindness (Singh & Wang, 2024). These diseases present progressive optic neuropathy, with slow development of visual field loss. Persons of African ancestry are particularly at risk since studies have shown them having a greater prevalence glaucoma morbidity (Heisel et al., 2021). Globally, glaucoma is the primary cause of blindness, according to the World Health Organization. High risk groups based on age and family history of glaucoma should be target endorsed to increase awareness and screening (Hassan et al., 2020; Study, 2024). There are several predisposing factors to glaucoma: high intraocular pressure, increasing age, family history and systemic diseases, including diabetes and hypertension. The prevailing type is the primary open angle glaucoma and the disease could be divided into several categories. These findings underline the importance of screening and initial therapy when it comes to the preservation of vision since the therapeutic treatment process introduces major changes in the course of the illness (Thakur et al., 2024; Umetsu et al., 2024). Management of glaucoma depends on the type as well as the stage of the disease at which it has been diagnosed. They include meditational treatment, laser treatment, and surgical procedures. Eye drops are used and they are supposed to minimize the production of the aqueous humor or to enhance its drainage to reduce IOP (King et al., 2024). There are laser therapies like selective laser trabeculoplasty that help to open the drainage gate and boost the amount of fluid the eye is able to remove. In more severe conditions, sometimes, various operations should be performed to develop new routes for drainage or to decrease fluid creation (Kolko et al., 2023; Takusagawa et al., 2024). Despite its prevalence, many patients remain unaware of their condition until significant vision loss has occurred. Research indicates that approximately one-third of glaucoma patients may become blind before seeking medical care, often due to a lack of knowledge about the disease and its early symptoms (Soqia et al., 2023). This issue is particularly pronounced in certain regions, including Africa, where inadequate access to healthcare services compounds the problem. It was found out that nearly half the glaucoma patients in Africa become at least partly blind before being diagnosed, Therefore, identification of patients’ level of awareness and knowledge deficit is paramount in the design of more effective educative strategies (Yenegeta et al., 2020). Treatment of glaucoma must be administered as early as possible for better prognosis to prevent blindness. Closely linked with raised levels of intraocular pressure, glaucoma may lead to irreversible damage to the optic nerve where its early signs are not treated. The inexplicable aspect of the disease requires constant public sensitization on the need to go for a routine eye checkup in an effort to manage the disease (Srivastava & Nitesh, 2024). The research conducted at the Sindh Institute of Ophthalmology and Visual Science (SIOVS) at Eye Hospital Hyderabad shall fill in the gaps of the existing information regarding glaucoma among patients. It is such insights that can come in handy in designing relevant sensitization activities meant to enhance public awareness of the disease and its determinants and the need to undertake screening. Filling these knowledge gaps, healthcare providers will be able to call attention on proper early diagnosis and treatment to avoid glaucoma-caused blindness. (Yimam et al., 2024). However, untreatable glaucoma results in a considerable financial cost not only in patients but also in health care systems and societies. Lack of training among the practicing health care personnel, restricted access to professional treatment, and ignorance are responsible for high numbers of the undiagnosed cases especially in Low and middle income countries (Anthony et al., 2024).

Aim of the Study

The study aims to assess the level of knowledge regarding glaucoma among patients at Sindh Institute of Ophthalmology and Visual Science (SIOVS) at Eye Hospital, Hyderabad

Significance of the Research Study

The assessment of glaucoma knowledge among the patients is a very important factor in health care. By assessing patient's knowledge, the study can enlighten patient outcomes by finding out how much of the information a patient should know to improve the early diagnosis of glaucoma and treatment thus reducing vision loss and the associated costs. The study seeks to reach the specific objectives by creating awareness of proper eye care among the patients, so that informed decisions could be made, hence improving the efficiency in health care delivery.

LITERATURE REVIEW

Glaucoma is a range of eye diseases that threaten the optic nerve and is the second main cause of blindness in the world. More often, it is related to high intraocular pressure level, thus, early diagnosis remains crucial to management. This literature review examines the symptoms of glaucoma and differentiates between its two main types: primary angle-closure glaucoma (PACG) and primary open angle glaucoma (POAG) (Senjam, 2020). Glaucoma is a progressive optic nerve damage that often occurs with a high IOP. In its most serious form, there are eight types of glaucoma (Lee & Mackey, 2022). A subgroup of secondary glaucoma is steroid-induced glaucoma which develops due to systemic or topical corticosteroids. This disease is characterized by IOP increase, and if not corrected can cause optic nerve damage and corresponding changes. Although the two conditions of the eye, cataracts and glaucoma, both take place in the elderly, they are different in pathophysiology, etiology, and management as describe by (Liu & Arrigg, 2022). Also, glaucoma can be without effect in initial phases and hence a lot of vision loss may occur before a person seeks medical attention. This literature review examines the difficulties in diagnosing asymptomatic glaucomatous visually loss and the health systems concerns (Quintero et al., 2023).

This research further looks into other public health implications of irreversibility of glaucoma-related blindness based on the current literature and treatment modalities. A main goal of glaucoma management is preservation of vision and prevention of further damage to the optic nerve through regulating IOP. Information on the current available treatments and their success rates, as well as future prospects of glaucoma therapy are presented in this review (Kaushik et al., 2023). Since the risk of glaucoma elevates with age, articles look into the glaucoma incidences reported in older populations; and age-related factors that affect diagnostic and management approaches. While glaucoma has potential to cause substantial vision loss, it is preventable and this paper looks at the preventive measures, the techniques used to diagnose patients, and the barriers to management among glaucoma patients (Schuman et al., 2024). While glaucoma is a condition that can result in the loss of a lot of vision it is most of the times preventable. A number of studies look at the efficiency of measures that can be adopted in a prevention of glaucoma, methods of case detection and the barriers to management among glaucoma patients. It is however important to reemphasize that despite having effective interventions glaucoma remains the leading cause of irreversible blindness and types of treatments review involve pharmacological management, lasers, and surgeries as well as the primary preventive measure of routinely check-ups (Teo et al., 2023) The general aim in Glaucoma treatment is to make sure that no additional vision is lost and preserve the existing vision with the help of managing IOP.

The article discusses the current options for managing glaucoma, the effectiveness of current management and prospects for further development of glaucoma treatment (Balasubramanian, 2023).

METHODOLOGY

Study Design

This study was a descriptive cross-sectional designed from July to September, 2024.

Study Setting

The study was undertaken in Sindh Institute of Ophthalmology and Visual Science (SIOVS) @ Eye Hospital Hyderabad.

Study Population

Target population was male and female patients who were attending the outpatient department (OPD) in (SIOVS) once in a week, specifically on Monday and Tuesday.

Sample Size

The sample consisted of 60 patients attending the hospital during the data collection period.

Inclusion Criteria

- All glaucoma patients, both male and female.
- Glaucoma patients who were willing to participate.
- Glaucoma patients who were present at the time of data collection.

Exclusion Criteria

- Patients with conditions other than glaucoma.
- Glaucoma patients who declined to participate in the study.
- Patients who were not present during the data collection.

Sampling Technique

The study involved the use of non-probability convenience sampling technique.

Source of Data

The research data were obtained using questionnaires developed for this study.

Research Tool

Questionnaires were used to collect data which was developed from the identified primary sources in the literature.

Data Collection Process

A letter of permission to conduct the study was obtained from the Director of Eye Hospital Hyderabad before data was collected. Each participant was read the basic description of the study and requested to volunteer. The participants provided both written as well as verbal consent. The selected glaucoma patients were then given the questionnaires.

Data Analysis

Descriptive statistics were calculated using the IBM SPSS software version 23. Participant demographic data and other descriptive variables were summarized using frequency and percentage.

Ethical Considerations

The administrative approval to carry out this study was provided by the Director Sindh Institute of Ophthalmology and Visual Science (SIOVS) @ Eye Hospital Hyderabad. Participants were given a choice of not to be involved in the study and there was no pressure to make them be involved in doing the study. All the participants provided consent and they were informed about the study, the risks and benefits involved for the study in their respective languages.

DATA ANALYSIS AND RESULTS

Demographic Analysis

Table 1 Classification of Gender

Categories	Frequency	Percent
Male	23	38.3
Female	37	61.7
Total	60	100.0

The demographic table 1 shows that 38.3%, 23 out of 60 participants are male and 61.7% 37 out of 60 are female thus the study sample has a higher number of females.

Table 2 Classification of Age

Categories	Frequency	Percent
20-25years	23	38.3
26-30years	10	16.7
31-35years	9	15.0
36-40year	6	10.0
Above 40	12	20.0
Total	60	100.0

Table 2 reveals a relatively large proportion of participants in the group of individuals aged between 20 to 25 years, 38.3% (n = 23). The second highest, 16.7% (n = 10) are between 26 and 30 years of age and the third highest 15.0% (n = 9) are between 31 and 35 years of age. The smallest group, 10.0% (n = 6) belongs to the age group 36-40 years.

Table 3 Classification of Education

Categories	Frequency	Percent
No Formal Education	17	28.3
Primary	15	25.0
Secondary	23	38.3
Higher	4	6.7
Total	60	100.0

Education level of participants is shown in Table 3. The largest number 38.3% (n=23) of the respondents are those with secondary education, While 28.3% (n=17) of the respondents have no formal education. 25.0% (n = 15) of participants reported completing their primary education, and only 6.7% (n = 4) have attended higher education.

Table 4 Classification of Occupation

Categories	Frequency	Percent
Student	20	33.3
Employed	6	10.0
Unemployed	14	23.3
Other	20	33.3
Total	60	100.0

Table 4 shows categories of occupation among the respondents. Of the participants 33.3% (n = 20) are students, 31.3 % (n =20) fell in to the 'Other' category, 23.3% (n = 14) were unemployed and the remaining 10% (n = 6) were employed.

Table 5 Classification of Residency

Categories	Frequency	Percent
Urban	18	30.0
Rural	42	70.0
Total	60	100.0

Table 5 below shows how the responses were grouped according to residence. Participants include 42 (70.0%) who live in rural settings, and 18 (30.0%) in the urban settings.

Table 6 Knowledge regarding Glaucoma

Statement		Freq:	Percent	Median	St. Dev:
Have you heard of glaucoma before?	Yes	44	73.3	1.000	.445
	No	16	26.7		
If yes what is your source of information?	Self-Reading	22	33.3	2.500	1.281
	Contact With Health Staff	10	16.7		
	Ophthalmic Clinic	15	25.0		
	Social-Media	12	20.0		
	Family Members	3	5.0		
What are the symptoms of glaucoma?	Painless Vision Loss	17	28.3	2.0000	.79618
	Sudden Vision Loss	37	61.7		
	None	1	1.7		
	Don't Know	5	8.3		
What Are The Increased Risk Factors Of Developing Glaucoma?(Select All That App	High Blood Pressure	10	16.7	4.000	2.140
	Cataract	3	5.0		
	Diabetes	14	23.3		
	Family History	5	8.3		
	Eye Infection	7	11.7		
	High Intraocular Pressure	14	23.3		
	Prolong Use Of Glasses	4	6.7		
Don't Know	2	3.3			

Certain drug like steroid can cause glaucom	Yes	24	40.0	2.000	.911
	No	11	18.3		
	Don't know	25	41.7		
Glaucoma is the same as cataract?	Yes	16	26.7	2.000	.812
	No	20	33.3		
	Don't know	24	40		
Glaucoma results in blindness?	Yes	51	85.0	1.000	.555
	No	5	8.3		
	Don't Know	4	6.7		
It is possible to have glaucoma without kno	Yes	16	26.7	2.000	.804
	No	21	35.0		
	Don't know	23	38.8		
Blindness from glaucoma is irreversible?	Yes	31	51.7	1.000	.884
	No	11	18.3		
	Don't know	18	30.0		
Is Glaucoma treatable?	Yes	48	80.0	1.00	.758
	No	2	3.3		
	Don't know	10	16.7		
Glaucoma occur at old age?	Yes	20	33.3	2.000	.790
	No	23	38.3		
	Don't know	17	28.3		
Blindness from glaucoma is preventable?	Yes	31	51.7	2.000	.9440
	No	11	18.3		
	Don't know	18	30.0		
Blindness by glaucoma can be prevented by regular eye check-up?	Yes	33	55.0	1.000	.908
	No	8	13.3		
	Don't know	19	31.7		
Blindness by glaucoma can be prevented by Diagnosis?	Yes	36	60.0	1.000	.876
	No	8	13.3		
	Don't know	16	26.7		
Blindness by glaucoma can be prevented by Early treatment:	Yes	50	83.3	1.000	.634
	No	4	6.7		
	Don't know	6	10.0		
Blindness by glaucoma can be prevented by Compliance with medications:	Yes	41	68.5	1.000	.770
	No	9	15.0		
	Don't know	10	16.7		
Blindness from glaucoma can be preve regular eye check-ups. Have you ever had an eye ch	Yes	23	38.3	2.0000	1.366
	No	29	48.3		
	Don't know	7	11.7		
What are the possible treatments for glaucor	Eye Drops	30	50.0	1.5000	1.292
	Pills	8	13.3		
	Surgery	13	21.7		
	Laser	5	8.3		
	Don't know	4	6.7		
Have you been diagnosed with glaucoma be	Yes	19	31.7	2.0000	.469
	No	41	68.3		

If Yes, what treatment have you received so	Nothing Yet	40	66.7	1.000	.993
	Medications	8	13.3		
	Surgery	7	11.7		
	Medication & Surgery	5	8.3		

The table 6 presents insights into the knowledge and awareness of glaucoma among 60 patients, revealing with 73.3% having heard of this condition. Most patients identified sudden vision loss (61.7%) as a symptom, while a significant number (28.3%) recognized painless vision loss. The mean for understanding symptoms was 2.00, with a standard deviation of 0.796, indicating a moderate level of agreement among patients regarding symptom recognition. Various sources of information were cited, with self-reading (mean = 2.50, SD = 1.281) and ophthalmic clinics (mean = 2.00, SD = 0.812) being the most common. However, misconceptions remain, such as the belief that glaucoma is the same as cataracts (26.7%) and that certain drugs do not contribute to the disease (40.0%). Importantly, while 85.0% acknowledged that glaucoma can lead to blindness, only 31.7% had previously been diagnosed, and a substantial 66.7% reported not receiving any treatment. This indicates both a need for better education on risk factors and symptoms, as well as the importance of regular eye check-ups for early detection and management of glaucoma.

Analysis

The findings of this research are useful to understand the participants' knowledge and demography about glaucoma. One significant indication, for instance, is that more than half of respondents (61.7%), exhibited low awareness of some common glaucoma symptoms because lack of knowledge is a factor that leads to late diagnosis of the condition (Hollitt et al., 2024; Khatib, 2023). Only 3% of respondents were aware of glaucoma, other 26.7% of participants had misconceptions about the disease mainly associating it with cataracts. This was consistent with another study by (McDonald, 2020) which revealed that many patients had misconceptions about glaucoma and other diseases of the eye; hence these misconceptions should form the basis of education and awareness. It also revealed that most participants were within the young adult age of 20-25 years, who are vital in preventive education considering the fact that their eye health can be greatly enhanced by early intervention with vision loss (Aziz et al., 2024). The majority of the respondents had acquired at least secondary education; nevertheless, participants' awareness regarding glaucoma risk factors remained relatively low (Fasoranti et al., 2023). The mean score of understanding symptoms was 2.00 (SD = 0.796), which proved that although some patients are knowledgeable of key symptoms, a portion of them is not well informed at all. Similar gaps in symptom recognition were reported in the study by (Muhsen et al., 2023), which found similar gaps in symptom recognition. Moreover, 85.0% understood that glaucoma causes blindness while only 31.7% had ever been diagnosed showing the lack of access or awareness to health care, 66.7% of respondents had no ever been treated, as was observed by other studies which showed that patients struggle to seek timely medical treatment (Acuff et al., 2023; Singh et al., 2024).

CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings of the study showed that the majority of people participating were female at the age from 20-25. Various had attained at least the secondary level of education, and the largest group was the student category. Most participants reported to have heard about glaucoma, but the knowledge level was relatively low especially on symptoms and risk factors. However, the belief that glaucoma is treatable; suggests that education of patients about this disease should be enhanced.

Recommendations

- Conduct specific informative activities in order to indicate symptoms, causative factors and the management of glaucoma.
- Develop partnerships with local health care settings for the purpose of identifying and tendering to underserved populations, for the programs on glaucoma awareness.
- Coordinate with other Eye care specialists to ensure at risk patients receive the necessary screen and treatment as soon as possible.

CONFLICT OF INTEREST

This study does not reveal any conflicts of interest reported by the authors.

FUNDING SOURCE

The research is conducted without any funding being provided.

ACKNOWLEDGMENT

Deeply appreciate my respected principal, lecturers and respondents for their moral support throughout my study.

REFERENCES

- Acuff, K., Delavar, A., Saseendrakumar, B. R., Wu, J.-H., Weinreb, R. N., & Baxter, S. L. (2023). Associations between socioeconomic factors and visit adherence among patients with glaucoma in the All of Us Research Program. *Ophthalmology Glaucoma*, 6(4), 405-412.
- Anthony, O. A., Anthony, E. U., Ijeoma, A. A., Malachy, E. C., Chukwunonyerem, O. B., & Chinyelu, U. A. (2024). Glaucoma screening among relatives of glaucoma patients in Anambra State, Nigeria. *Advances in Research*, 25(3), 175-185.
- Aziz, H., Shahid, R., Khalil, I., & Haider, S. (2024). Awareness About Glaucoma and Associated Factors Among Glaucoma Patients Visiting Munawar Memorial Hospital Chakwal: Awareness About Glaucoma and Associated Factors. *THE THERAPIST (Journal of Therapies & Rehabilitation Sciences)*, 14-19.
- Balasubramanian, M. (2023). ADVANCEMENTS IN GLAUCOMA TREATMENT: A REVIEW OF CURRENT AND EMERGING MODALITIES. *Int J Acad Med Pharm*, 5(4), 1809-1815.
- Dhawale, K. K., & Tidake, P. (2024). A Comprehensive Review of Recent Advances in Minimally Invasive Glaucoma Surgery: Current Trends and Future Directions. *Cureus*, 16(7).
- Fasoranti, A. B., Fasoranti, I. O., Onwuama, M., & Kareem, A. J. (2023). Knowledge of glaucoma among patients of selected health facilities in Ondo state, Nigeria. *Int J Community Med Public Health*, 10(7), 2372-2378.
- Fernández-Albarral, J. A., Ramírez, A. I., de Hoz, R., Matamoros, J. A., Salobar-García, E., Elvira-Hurtado, L.,...Ramírez, J. M. (2024). Glaucoma: from pathogenic mechanisms to retinal glial cell response to damage. *Frontiers in Cellular Neuroscience*, 18, 1354569.
- Hassan, D. W. A., Alsibai, B. A., Alhourri, A. N., Alhajeh, R. Y., Suleiman, A. A., & Al Bdour, M. D. (2020). Awareness and knowledge about glaucoma among patients attending outpatient clinics of Jordan University Hospital. *Saudi Journal of Ophthalmology*, 34(4), 284-289.

- Heisel, C. J., Fashe, C. M., Garza, P. S., Gessesse, G. W., Nelson, C. C., Tamrat, L.,...Lawrence, S. D. (2021). Glaucoma awareness and knowledge among Ethiopians in a Tertiary Eye Care Center. *Ophthalmology and Therapy*, 10, 39-50.
- Hollitt, G. L., Keane, M. C., Nguyen, T. T., Hassall, M. M., Siggs, O. M., Craig, J. E., & Souzeau, E. (2024). Healthcare professionals' knowledge and attitudes towards polygenic risk testing for glaucoma. *Clinical & Experimental Ophthalmology*.
- Kaushik, M., Tiwari, P., Dada, T., & Dada, R. (2023). Beyond the optic nerve: Genetics, diagnosis, and promising therapies for glaucoma. *Gene*, 147983.
- Khatib, W. (2023). Quality of Life among Patients with Glaucoma in the West Bank, Palestine: A Cross-Sectional Study. *Ethiopian Journal of Health Sciences*, 33(4).
- King, A. J., Hudson, J., Azuara-Blanco, A., Burr, J., Kernohan, A., Homer, T.,...Barton, K. (2024). Evaluating Primary Treatment for People with Advanced Glaucoma: Five-Year Results of the Treatment of Advanced Glaucoma Study. *Ophthalmology*, 131(7), 759-770.
- Kolko, M., Gazzard, G., Baudouin, C., Beier, S., Brignole-Baudouin, F., Cvenkel, B.,...Jespersen, E. (2023). Impact of glaucoma medications on the ocular surface and how ocular surface disease can influence glaucoma treatment. *The ocular surface*, 29, 456-468.
- Lee, S. S.-Y., & Mackey, D. A. (2022). Glaucoma—risk factors and current challenges in the diagnosis of a leading cause of visual impairment. *Maturitas*, 163, 15-22.
- Liu, J., & Arrigg, C. A. (2022). Corticosteroid-Induced Glaucoma. In *Albert and Jakobiec's Principles and Practice of Ophthalmology* (pp. 2541-2560). Springer.
- McDonald, L. (2020). *Self and Others: An Exploration of Chronic Open-angle Glaucoma as a Chronic Illness* [City, University of London].
- Muhsen, S., Al-Huneidy, L., Maaita, W., AlQirem, L., Madain, Z., Sweis, J.,...Al-Ani, A. (2023). Predictors of glaucoma knowledge and its risk factors among Jordanian patients with primary open angle glaucoma at a tertiary teaching hospital: A cross-sectional survey. *Plos one*, 18(5), e0285405.
- Quintero, M., Mihailovic, A., Sikder, S., Jun, A. S., Daoud, Y., & Ramulu, P. Y. (2023). Distinguishing glaucoma, cataract, and glaucoma suspect based on visual symptoms. *Journal of Glaucoma*, 32(8), 631-639.
- Schuman, J. S., Anderson, R. L., & Epstein, D. L. (2024). The Patient's History: Symptoms of Glaucoma. In *Chandler and Grant's Glaucoma* (pp. 25-32). CRC Press.
- Senjam, S. S. (2020). Glaucoma blindness—A rapidly emerging non-communicable ocular disease in India: Addressing the issue with advocacy. *Journal of Family Medicine and Primary Care*, 9(5), 2200-2206.
- Singh, C., & Wang, T. (2024). Glaucoma-A Window into Future Neurodegeneration. *Medicine and Clinical Science*.
- Singh, P., Rizyal, A., & Karmacharya, S. (2024). Profile of Glaucoma Patients at a Tertiary Care Centre in Gokarneshwor, Kathmandu, Nepal. *Nepal Medical College Journal*, 26(3), 204-209.
- Soqia, J., Ataya, J., Alhalabi, R., Alhomsy, R., Hamwy, R., Mardini, K., & Hamzeh, A. (2023). Awareness and knowledge of glaucoma among visitors of main public hospitals in Damascus, Syria: a cross-sectional study. *BMC ophthalmology*, 23(1), 17.
- Srivastava, N., & Nitesh, S. I. H. (2024). Level of Awareness and Knowledge about Glaucoma among Adult Patients. *Int J Cur Res Rev/ Vol*, 16(01), 1.
- Study, V. L. E. G. o. t. G. B. o. D. (2024). Global estimates on the number of people blind or visually impaired by glaucoma: A meta-analysis from 2000 to 2020. *Eye*, 38(11), 2036.
- Takusagawa, H. L., Hogue, A., Sit, A. J., Rosdahl, J. A., Chopra, V., Ou, Y.,...WuDunn, D. (2024). Selective Laser Trabeculoplasty for the Treatment of Glaucoma: A Report by the American Academy of Ophthalmology. *Ophthalmology*, 131(1), 37-47.

- Teo, B. H., Eong, J. T. A., & Eong, K. G. A. (2023). Steroid-induced glaucoma: an avoidable cause of irreversible blindness. *BMJ Case Reports CP*, 16(9), e254709.
- Thakur, S., Lavanya, R., Yu, M., Tham, Y.-C., Da Soh, Z., Teo, Z. L.,...Aung, T. (2024). Six-Year Incidence and Risk Factors for Primary Open-Angle Glaucoma and Ocular Hypertension: The Singapore Epidemiology of Eye Diseases Study. *Ophthalmology Glaucoma*, 7(2), 157-167.
- Umetsu, A., Tanaka, M., Sato, T., Akiyama, Y., Endo, K., Mori, K.,...Hanawa, N. (2024). High Intraocular Pressure Is Independently Associated With New-Onset Systemic Hypertension Over a 10-Year Period. *Circulation Journal*, 88(10), 1689-1696.
- Yenegeta, Z., Tsega, A., Addis, Y., & Admassu, F. (2020). Knowledge of glaucoma and associated factors among adults in Gish Abay town, Northwest Ethiopia. *BMC ophthalmology*, 20, 1-5.
- Yimam, W., Anbesaw, T., Seid, M., Kumar, P., & Wolie, H. (2024). Knowledge about glaucoma among adults in Africa: a systematic review. *BMC ophthalmology*, 24(1), 69.