The Association Between Glaucoma Severity and Anxiety And Depression in Glaucoma Patients at DR. Soetomo General Hospital, Surabaya, Indonesia

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Article Information

Abstract

Introduction: Glaucoma is a chronic progressive disease and one of the leading causes of blindness worldwide. Vision loss due to glaucoma affects not only the physical aspect but also has an impact on the patient's mental health. Poor mental condition may influence the success of therapy and reduce the patient's quality of life. ***Objective:*** *The objective of this study is to examine the association between the severity of glaucoma and anxiety and depression in the Eye Outpatient Unit of RSUD Dr. Soetomo Surabaya, Indonesia.* ***Method:*** *A cross-sectional study was conducted involving 50 glaucoma patients at the Ophthalmology Outpatient Unit of Dr. Soetomo General Hospital, Surabaya. Mental health status was assessed through interviews using the Hospital Anxiety and Depression Scale (HADS). The Spearman's rho correlation test was applied to evaluate the association between glaucoma severity and the presence of anxiety and depression.* ***Result and Discussion:*** *Primary Open-Angle Glaucoma (POAG) was the most prevalent type, and most cases were bilateral. Statistical analysis demonstrated a significant correlation between glaucoma severity and anxiety (r = 0.599), between glaucoma severity and depression (r = 0.520), and also between anxiety and depression (p = 0.001).* ***Conclusions:*** *The severity of glaucoma is related to anxiety and depression*

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Introduction

Blindness represents a significant global health problem, particularly in Indonesia. According to the World Health Organization (WHO), glaucoma is the second leading cause of blindness worldwide. By 2040, the number of individuals with glaucoma is projected to reach 112 million cases (Robert et al., 2015); (Purwitasari, 2020). Glaucoma affects approximately 3.5% of individuals aged 40 to 80 years. It currently impacts more than 70 million people globally, with about 10% experiencing bilateral blindness (Wagner et al., 2022); (Sunariasih, Prabowo, & Artha, 2022); (Akbari, Rifada, & Gustianty, 2023). Nearly half of all glaucoma cases worldwide originate from the Asian continent. The prevalence of glaucoma in Indonesia is 4.6%. East Java Province ranks tenth, with a glaucoma prevalence of 0.55%. Almost half of all glaucoma patients (47%) reside in Asia, where 87% of cases are attributed to primary angle closure glaucoma (PACG) (Urbonavičiūtė et al, 2022).

Glaucoma is an ocular disease characterized by damage to the optic nerve, accompanied by distinctive visual field defects. This damage can lead to visual impairment and ultimately result in permanent (*irreversible*) blindness (Kemenkes RI, 2015). Early detection can slow disease progression; however, because visual field loss in glaucoma typically presents no symptoms until the late stages, timely diagnosis is often delayed. Common risk factors for glaucoma include advanced age, a positive family history, race, and elevated intraocular pressure (IOP). Once diagnosed with glaucoma, most patients require lifelong management (Soemantri et al., 2018); (Arlina, 2020); .

Blindness resulting from glaucoma can lead to psychological impacts such as anxiety and depression. Previous studies have reported that the prevalence of anxiety among glaucoma patients ranges from 13% to 64%, while the prevalence of depression ranges from 10.9% to 57.0% (Shin et al., 2021). Visual impairment in individuals with glaucoma, which cannot be cured, may cause mood disturbances and reduced productivity. Fear of blindness, substantial economic burden, diminished quality of life due to limited physical activity, inadequate communication, or poor understanding of medical terminology can contribute to anxiety and depression in these patients (Zhang et al., 2018). Insufficient communication and information provided by healthcare professionals at the time of diagnosis may lead to ignorance, ambiguity, doubt, and uncertainty among glaucoma patients. Persistent anxiety and depression can further accelerate the development of other conditions, such as cardiovascular, gastrointestinal, and respiratory disorders (Ramesh et al., 2024).

Research addressing the mental health dimensions of glaucoma patients remains notably limited, despite the substantial psychological burden associated with this chronic and potentially blinding disease. Understanding the interplay between disease severity and psychological well-being is essential, as anxiety and depression may influence treatment adherence, disease perception, and overall quality of life. Therefore, this study aims to comprehensively examine the association between the severity of glaucoma and the levels of anxiety and depression among patients receiving care at the Ophthalmology Outpatient Clinic of Dr. Soetomo General Hospital in Surabaya.

Method

This study employs an analytical observational design using a cross-sectional approach to examine the association between glaucoma severity and levels of anxiety and depression. The Hospital Anxiety and Depression Scale (HADS) questionnaire was

utilized as the primary assessment tool. Patients diagnosed with glaucoma who met the established inclusion and exclusion criteria were recruited for the study. The type and severity of glaucoma were determined through Optical Coherence Tomography (OCT) and Humphrey Visual Field Analyzer examinations. Subsequently, participants were asked to complete the HADS questionnaire, and anxiety and depression scores were obtained by summing the respective item responses.

This study employed two primary variables: the dependent variable, defined as the severity of glaucoma, and the independent variables, consisting of anxiety and depression among patients with glaucoma. The research instruments comprised medical record data and patient questionnaires obtained from the Ophthalmology Outpatient Clinic of Dr. Soetomo General Hospital, Surabaya. The study population comprised all patients diagnosed with glaucoma during the period of July to September 2025, totaling 67 individuals. The research sample consisted of glaucoma patients who met the predetermined inclusion and exclusion criteria. Data collection was carried out by administering the Hospital Anxiety and Depression Scale (HADS) questionnaire to 50 respondents using a consecutive sampling technique.

The data set described in this study consists of secondary data taken from patient medical records and questionnaires covering demographic and clinical variables such as age, gender, laterality, type of glaucoma, disease duration, and glaucoma severity. All collected data were arranged in tabular format and processed using statistical software. Data processing procedures included injection, coding, data entry, cleaning, presentation, and subsequent statistical analysis. Statistical processing was performed using the latest available version of Statistical Product and Service Solutions (SPSS) software.

Ethical approval for this study was obtained from the Health Research Ethics Committee of Dr. Soetomo General Hospital, ensuring compliance with established ethical standards for human subjects research.

Research and Discussions
1.   Result
In this study, sampling was conducted among patients diagnosed with glaucoma at the Ophthalmology Outpatient Unit of Dr. Soetomo General Hospital. Following data collection using the HADS questionnaire, a total of 50 patients were obtained as study participants. Subsequent data processing produced the characteristics of the study sample, as presented in Table 1.

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Table 1
Characteristics of samples

Variable	Frequency n (%)
Gender	
Male	22 (44%)
Female	8 (56%)
Age	
≥ 18 - 30 years	2 (4%)
31 - 40 years	4 (8%)
41 - 50 years	8 (16%)
51 - ≤65 years	22 (44%)
>65 years	14 (28%)
Glaucoma Severity	
Mild	21 (42%)
Moderate	3 (6%)
Severe	26 (52%)
Laterality	
Unilateral	14 (28%)
Bilateral	36 (72%)
Duration of Disease	
<5 years	43 (86%)
5-10 years	6 (12%)
>10 years	1 (2%)
Type of Glaucoma	
POAG	24 (48%)
PACG	13 (26%)
Secondary	13 (26%)

After analyzing the data between the characteristics of the glaucoma patient sample and anxiety and depression, the results showed a statistically significant difference in glaucoma severity and anxiety and depression. Meanwhile, other characteristic variables, including age, laterality, disease duration, and glaucoma type, did not show any significant difference, as shown in Table 2.

Table 2
Analysis of the characteristics of glaucoma patients with anxiety and depression

Variabel	r	Anxiety (P Value)	r	Depression (P Value)
Gender	0.035	0.807	0.123	0.394
Age	0.059	0.686	-0.209	0.144
Lateralitas	-0.192	0.181	-0.143	0.322
Duration of Disease	0.274	0.054	0.000	1000
Glaucoma Severity	0.599	0.001	0.520	0.001
Type of Glaukoma	0.036	0.804	0.044	0.761

In this study, anxiety levels were assessed using the HADS A questionnaire. Based on the data collection results, 25 samples (50%) experienced anxiety. The distribution details show that 4 samples (8%) came from patients with mild glaucoma, 1 sample (2%) from a patient with moderate glaucoma, and 20 samples (40%) from patients with severe glaucoma, as shown in Table 3.

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Table 3
Characteristics of glaucoma severity with anxiety

Glaucoma Severity	Without Anxiety	(%)	Anxiety	(%)
Mild	17	34%	4	8%
Moderate	2	4%	1	2%
Severe	6	12%	20	40%
Total	**25**	**50%**	**25**	**50%**

The results of the analysis showed a Spearman correlation coefficient value of $r = 0.599$ with $p < 0.05$, which means that there is a moderate and statistically significant association between the severity of glaucoma and anxiety in patients, as shown in Table 4.

Table 4
Analysis of the association between the severity of glaucoma and anxiety

Spearman's rho		**Severity of Glaucoma**	**Anxiety**
Severity of Glaucoma	Correlation Coefficient	1.000	0.599
	Significant (p-value)	.	<0.001
	N	50	50
Anxiety	Correlation Coefficient	0.599	1.000
	Significant (p-value)	<0.001	.
	N	50	50

To assess the presence or absence of depression in patients with glaucoma, data collection was carried out using the HADS-D questionnaire on the entire study sample. Among glaucoma patients at the Ophthalmology Outpatient Unit of Dr. Soetomo General Hospital, Surabaya, a total of 26 samples (52%) were found to have depression. The distribution based on glaucoma stage showed that 10 samples (20%) were from patients with mild glaucoma, 2 samples (4%) from patients with moderate glaucoma, and 14 samples (28%) from patients with severe glaucoma, as shown in Table 5.

Table 5
Characteristics of glaucoma severity with depression

Glaucoma Severity	**Without Depression**	**(%)**	**Depression**	**(%)**
Mild	11	22%	10	20%
Moderate	1	2%	2	4%
Severe	12	24%	14	28%
Total	**24**	**48%**	**26**	**52%**

The results of the analysis showed a Spearman correlation coefficient value of $r = 0.520$ with $p < 0.05$, which means that there is a moderate and statistically significant association between the severity of glaucoma and depression in patients, as shown in Table 6.

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Table 6
Analysis of the association between the severity of glaucoma and depression

Spearman's rho		Severity of Glaucoma	Depression
Severity of Glaucoma	Correlation Coefficient	1.000	0.520
	Significant (p-value)	.	<0.001
	N	50	50
Depression	Correlation Coefficient	0.520	1.000
	Significant (p-value)	<0.001	.
	N	50	50

In this study, a subgroup of patients was also identified as experiencing both anxiety and depression simultaneously. Within this subgroup, the HADS-A and HADS-D scores were notably elevated. Based on the analysis of patient characteristics, a total of 10 samples (12%) were found to exhibit concurrent anxiety and depression. The distribution according to glaucoma severity showed that 4 samples (8%) were patients with mild glaucoma, 1 sample (2%) had moderate glaucoma, and 5 samples (10%) were patients with severe glaucoma, as shown in Table 7.

Table 7
Characteristics of glaucoma severity with anxiety and depression

Glaucoma Severity	Without Anxiety and Depression	(%)	Anxiety and Depression	(%)
Mild	17	34%	4	8%
Moderate	2	4%	1	2%
Severe	21	42%	5	10%
Total	**40**	**80%**	**10**	**20%**

The analysis results showed a Spearman correlation coefficient of r = 0.599 with p < 0.05, indicating a moderate and statistically significant association between the severity of glaucoma and the levels of anxiety and depression among the patients, as shown in Table 8.

Table 8
Analysis of the association between the severity of glaucoma and anxiety and depression

Spearman's rho		Severity of Glaucoma	Depression
Severity of Glaucoma	Correlation Coefficient	1.000	0.599
	Significant (p-value)	.	<0.001
	N	50	50
Anxiety and Depression	Correlation Coefficient	0.599	1.000
	Significant (p-value)	<0.001	.
	N	50	50

2.   Discussion

Based on age categories, the largest proportion of subjects fell within the 50–65-year age group, consisting of 22 patients (44%). The mean age of the study population was 56.88 years. The distribution of samples based on ocular laterality showed that 36 patients (72%) had bilateral glaucoma, while 14 patients (28%) had unilateral glaucoma. In this study, no statistically significant difference was found between the types of glaucoma POAG and PACG. The majority of subjects were diagnosed with POAG, comprising 24 samples (48%), followed by PACG with 13 samples (26%), and secondary

glaucoma with 13 samples (26%). These findings are consistent with the study by Ajith et al. (2022), which also reported no significant difference between glaucoma type and the level of depression. Nevertheless, Ajith et al. noted that depression levels tended to be higher in patients with PACG (40.9%) than in those with POAG (31.7%).

In this study, 25 patients (50%) were found to experience anxiety. The analysis indicated that the relationship between the severity of glaucoma and anxiety was statistically significant, although the strength of the correlation was classified as moderate. These findings suggest that individuals with glaucoma not only face visual impairment but also frequently present with psychological comorbidities such as anxiety.

A study conducted by Zahra et al. (2020) in Indonesia reported that the prevalence of anxiety among glaucoma patients was 23.1% in early-stage disease, 64.6% in moderate-stage disease, and 12.3% in advanced-stage disease. Meanwhile, research by Lim et al. (2016) in Singapore showed a relatively high prevalence of anxiety in glaucoma patients, reaching approximately 64%. In addition, a study by Ajith et al. (2022) in North Kerala, India, reported an anxiety prevalence of 25% among glaucoma patients, with 16.22% experiencing mild anxiety, 4.73% moderate anxiety, and 4.05% severe anxiety.

In this study, 26 patients (52%) were found to experience depression. Statistical analysis revealed a significant relationship between the severity of glaucoma and the level of depression, although the strength of the correlation was classified as moderate. These findings are consistent with a study by Wu et al. (2022) in China, which reported a depression prevalence of 25.78% among glaucoma patients. Meanwhile, several other studies have documented varying prevalence rates of depression in individuals with glaucoma, including 57% in Turkey, 30% in Singapore, 19% in Australia, 12.1% in Hungary, and 10.9% in the United States. Additionally, research by Ajith et al. (2022) in North Kerala, India, found that 35.81% of glaucoma patients experienced depression, with 20.9% presenting with mild depression, 8.1% with moderate depression, and 6.7% with severe depression.

According to Ubochi (2022), patients with advanced-stage glaucoma tend to have a higher vulnerability to anxiety and depression. The severity of glaucoma is known to influence the emergence of psychological disorders, particularly because patients must undergo lifelong, long-term therapy, which may impose an additional emotional burden. These findings are consistent with the study by Filho et al. (2016), which reported that the more severe the glaucoma, the greater the depressive symptoms experienced by patients. Similarly, Kong et al. (2015) reported a positive association between glaucoma severity and increased depressive symptoms, indicating that the psychological impact of the disease intensifies in parallel with the progression of visual impairment.

In this study, 10 patients (20%) were found to experience both anxiety and depression simultaneously. The analysis demonstrated that the relationship between glaucoma severity and the presence of anxiety and depression was statistically significant, although the strength of the correlation was classified as moderate. These findings indicate that, while glaucoma does influence psychological well-being, the association between disease severity and psychological disturbances tends to be relatively modest.

Among patients who exhibited both anxiety and depression, all were diagnosed with advanced-stage glaucoma. Several studies have reported that the prevalence of anxiety and depression among individuals with glaucoma is higher than that observed in healthy populations. Most literature suggests that the heightened prevalence of these psychological disorders is a consequence of the glaucoma diagnosis itself, triggered by

fear of potential blindness, substantial financial burden, and limitations in daily activities (Shin DK et al., 2021).

Recent studies have shown that negative emotions—such as anxiety and depression are not only psychological consequences but may also serve as risk factors for physical illnesses. Other research indicates that the severity of glaucoma may be influenced by the presence of anxiety and depression. Anxiety and depression are stress responses believed to be mediated by activity within the amygdala. These emotional responses stimulate neurotransmitter secretion and activate the autonomic nervous system, which subsequently affects multiple organ systems. The autonomic nervous system, which is highly sensitive to emotional states, is also thought to play an important role in the development and progression of glaucoma (Shin DK et al., 2021).

Conclusion

The severity of glaucoma is related to anxiety and depression. Primary Open-Angle Glaucoma (POAG) was the most prevalent type, and most cases were bilateral. Statistical analysis demonstrated a significant correlation between glaucoma severity and anxiety ($r = 0.599$), between glaucoma severity and depression ($r = 0.520$), and also between anxiety and depression ($p = 0.001$).

The study examining the association between glaucoma severity and the levels of anxiety and depression among patients at the Ophthalmology Outpatient Unit of Dr. Soetomo General Hospital, Surabaya, yielded the following conclusions: A significant prevalence of anxiety and depression was identified among patients with glaucoma. Patients with severe-stage glaucoma exhibited higher levels of anxiety and depression compared to those in other stages of disease severity.

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