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The Identification of Quality of Life in Glaucoma Patients at Balung Regional Hospitals

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ABSTRACT

Glaucoma is a chronic neurodegenerative disorder of the optic nerve characterized by an increased IOP and progressive. The main threat to patients with visual impairment is the gradual loss of vision. Decreased vision function in glaucoma patients and inability to adapt to changes in body functions will have an impact on the ability to carry out daily activities and will affect the quality of life. The aim of this study was to analyze the quality of life in glaucoma patients at the Jember Regency Balung Regional Hospital. This study used a quantitative descriptive with a cross-sectional approach. 97 respondent were treated at Poli Mata Hospital in Balung Regional Hospital, Jember Regency obtained by purposive sampling technique. Collected data using the National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ 25). Data analysis using univariate. The results of the study were 49 respondents (50,5%) had a qood quality of life and 48 respondents (49,5%) had a less quality of life, near vision is the most problematic subscale in all of domains. The quality of life of glaucoma patients is a good category, which means respondents are satisfied with their health and vision condition does not significantly interfere with daily activities. Respondents can still do their daily activities independently even though slightly limited, both with and without glasses

Keywords: Glaucoma, NEI-VFQ 25, Quality of Life

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1. INTRODUCTION

Glaucoma is a chronic neuro-degenerative disorder of the optic nerve in which death of the retinal ganglion cells and loss of optic nerve axons result in structural and functional deficits (Waisbourd et al., 2015). Optic nerve damage is associated with increased intraocular pressure (IOP) due to impaired aqueous humor drainage in the eye. Glaucoma is often referred to as a "silent thief of sight" because most patients are unaware they have it until they experience changes in vision (Smeltzer et al., 2010).

The main threat to patients with vision impairment is the gradual loss of vision (Majernikova et al., 2021). Visual function impairment in glaucoma patients triggers serious problems and affects various aspects of their lives, from physical to psychological (Siswoyo et al., 2021). The decline in patients' quality of life corresponds to the severity of glaucoma, which affects vision function deterioration or loss.

According to the World Health Organization (WHO) predictions, the number of glaucoma patients increased from 60.7 million in 2010 to 79.4 million in 2020 and is expected to continue rising with population growth and aging. Based on data from Kemenkes RI (Indonesian Ministry of Health), the number of Indonesians suffering from blindness due to glaucoma reached 1.8 million in 2022 (Kemenkes RI, 2022). The result of the study in Slovakia shows that patients with visual impairment, especially glaucoma, subjectively assess their quality of life more negatively than patients with better vision, with significant results across all dimensions of quality of life (Majernikova et al., 2021). The result of the study in India indicates that the quality of life of glaucoma patients is categorized as good (38.9%) and poor (17.9%) (Alka et al., 2023). The result of the study in Indonesia shows that the quality of life of glaucoma patients is categorized as good for 37 individuals (54.4%) and less good for 31 individuals (45.6%) (Ananda, 2016). The result of the study in Jember indicates that the quality of life of glaucoma patients is categorized as good for 47 individuals (64.4%) and poor for 26 individuals (35.6%) (Siswoyo et al., 2019). Another result of the study in Jember shows that the quality of life of glaucoma patients is categorized as good for 58 individuals (81.7%) and poor for 13 individuals (18.3%) (Siswoyo et al., 2021).

Glaucoma is caused by increased intraocular pressure (IOP) determined by the level of aqueous humor production. High IOP also affects increased blood supply pressure and impairs blood flow to the optic nerve, leading to ischemia that gradually reduces vision function (Smeltzer et al., 2010). Decreased visual function, inability to adapt to changes in bodily functions in glaucoma patients, and limitations due to the disease impact an individual's perception of their quality of life. The diagnosis of potentially blinding diseases causes anxiety, fear, and requires various levels of acceptance and adaptation to changing visual perceptions (Majernikova et al., 2021). Moreover, patients with visual impairment are at higher risk of social withdrawal and

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depression (Quaranta et al., 2016), difficulty in performing basic activities such as driving, reading, and socializing (Kalyani et al., 2020), difficulty in seeing objects in peripheral vision, orientation and mobility issues, night vision problems, difficulties in adapting to light and dark, reading, and problems estimating distances, which are the main reasons for the increasing number of all causes of falls and serious injuries (Skalicky & Goldberg, 2013; Hagman, 2013).

As a chronic disease, glaucoma permanently impairs patient vision and also affects various physical, social, and psychological aspects of patients' lives (Saswati et al., 2023). Glaucoma patients require continuous treatment and monitoring due to the progressive nature of glaucoma. Solutions to address quality of life issues in glaucoma patients include the role of nursing in identifying patient quality of life and assisting in improving or maintaining the quality of life of glaucoma patients (Siswoyo et al., 2019). Additionally, there is a need to promote active screening for glaucoma patients (Majernikova et al., 2021).

2. METHODE

descriptive with a cross-sectional approach. The study population consists of glaucoma patients receiving treatment at the Eye Clinic of Balung Regional Hospital, Jember Regency, totaling 662 individuals (January-October 2023). A sample of 97 individuals was used, calculated using the Lameshow formula.

The research sampling technique used purposive sampling with inclusion criteria being glaucoma patients aged at least 18 years, patients diagnosed with glaucoma for more than 6 months, glaucoma patients willing to participate in the study as respondents, and cooperative glaucoma patients. Exclusion criteria were patients who were blind other than due to glaucoma and patients who withdrew from the study.

Data collection used the NEI-VFQ 25 questionnaire (National Eye Institute Visual Functioning Questionnaire-25). The NEI-FVQ 25 questionnaire consists of 25 questions with 12 subscales. Scores are calculated for each subscale, ranging from 0 (worst) to 100 (no vision-related issues). The scores of each subscale are summed and then averaged. Scores from each question of each subscale that do not have missing values are summed and then divided by the number of questions in that subscale. The total scores from each subscale are summed and averaged, except for the general health subscale. The average scores of the 11 subscales yield a composite (combined) score indicating the patient's quality of life (Mangione, 2000). The

composite scores are then categorized to obtain an overview of the patient's quality of life. Variables are categorized using the median cut-off point because the data are not normally distributed (Sinaga et al., 2023). The categorization of the quality of life variable in general is divided into two categories based on the median value, as good if the score ≥ 70.25 and if the total score < 70.25, it is categorized as less. The same procedure is applied to the quality of life domains, categorizing each indicator based on the median value of each indicator

3. RESULTS

Respondents Characteristics

Table 1. Age Characteristics and Visual Acuity

Characteristics	Mean	SD
Age (years)	59,24	9,445
Visual Acuity of the right eye (VOD)	0,1379	0,16199
Visual acuity of the left eye (VOS)	0,1429	0,19288

Table 1 shows the mean age of respondents was 59 years. The mean of visual acuity of the right eye (VOD) was 0,1379 and visual acuity of the left eye (VOS) was 0,1429.

Table 2. Gender Characteristics, Education, Occupation, Length of Suffering

Characteristics		Frequency (f)	Percentage (%)
Gender	Male	31	32
	Female	66	68
Education	Didn't graduate from elementary school	23	23,7
	Elementary school	42	43,3
	Junior high school	11	11,3
	Senior high school	19	19,6
	Bachelor	2	2,1
Occupation	Not working/housewifes	41	42,3
	Farmer/farm laborer	29	29,9
	Civil servants	1	1
	Retired	5	5,2
	Entrepreneur	15	15,5
	Self Employed	3	3,1
	Others	3	3,1
Length of Suffering of Glucoma	< 1 year	0	0
	> 1 year	97	100

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Table 2 shows the majority were female (68%), with elementary/ equivalent education level (43,3%), did not work or were housewifes (42,3%), all of the patients had suffered from glaucoma more than 1 years.

Quality of Life of Patients Glaucoma

Table 3. Quality of Life

Quality of Life	Frequency (f)	Percentage (%)
Good	49	50,5
Less	48	49,5
Total	97	100

Table 3 shows categorized into 2 categories using median cut of point. The categorization of the quality of life divided into two categories, good quality of life score ≥ 70,25, while poor quality of life score < 70,25. The results of the study were 49 respondents (50,5%) had a qood quality of life and 48 respondents (49,5%) had a less quality of life.

Table 4. Indicator of Quality of Life in Glaucoma

Domain	Indicator	Category	Frequency (f)	Percentage (%)
Physical	General Health	Good	69	71,1
		Less	28	28,9
	General Vision	Good	88	90,7
		Less	9	9,3
	Ocular Pain	Good	57	58,8
		Less	40	41,2
Psychological	Mental Health	Good	50	51,5
		Less	47	48,5
Social	Social Functioning	Good	47	48,5
		Less	50	51,5
	Role Difficulties	Good	49	50,5
		Less	48	49,5
	Dependency	Good	47	48,5
		Less	50	51,5
Environment	Near Vision	Good	34	35,1
		Less	63	64,9
	Distance Vision	Good	46	47,4
		Less	51	52,6
	Driving	Good	0	0
		Less	97	100
	Color Vision	Good	58	59,8
		Less	39	40,2
	Peripheral Vision	Good	73	75,3
		Less	24	24,7

Table 4 shows quality of life in four domains: physical, psychological, social, and environmental. In the physical domain, the eye pain indicator shows the fewest patients with good quality of life, totaling 57 individuals (58.8%). In the psychological domain, mental health indicates good quality of life for 50 individuals (51.5%). In the social domain, social function and dependence show poor quality of life for 50 individuals each (51.5%). In the environmental domain, near vision indicates poor quality of life for 63 individuals (64.9%), and driving indicates poor quality of life for 97 individuals (100%).

4. DISCUSSIONS

Respondents Characteristics

The mean age of glaucoma patients at Balung Regional Hospital, Jember Regency is 59.24 years old. It is not significantly different from previous study conducted by (Majernikova et al., 2021), in which the mean age of respondents was 59.4 with the majority aged over 70 years. The same results were also found by Kalyani et al. (2020), showing an average age of respondents of 59.2 years. The risk of glaucoma increases with age. As one ages, the flow of aqueous humor decreases, resulting in increased intraocular pressure (IOP) (McMonnies, 2016). With age, there can be degeneration of the eyes, which can affect the structural changes in the aqueous outflow system and lead to increased IOP. Glaucoma classification consists of primary glaucoma, secondary glaucoma, glaucoma associated with other conditions, such as congenital disorders or development, anomalies, and steroid use (Smeltzer et al., 2010), which essentially can affect anyone from birth to old age, so glaucoma can also affect young people. Most of the respondents' ages fall into the pre-elderly category, which is at risk of glaucoma.

The visual acuity of the right eye of glaucoma patients has an average of 0.1379 or equivalent to 5/40, and the visual acuity of the left eye has an average of 0.1429 or equivalent to 6/40. Study by Rosalina (2011) found the best visual acuity for both right and left eyes with a value of 1 (6/6) and the worst of 0.5 (6/12) with averages of 0.89 and 0.91, respectively. Visual function is classified into 4 categories: normal vision, mild visual impairment, severe visual impairment, and blindness. Mild and severe visual impairments are categorized as low vision. According to WHO (2019), low vision is categorized as moderate vision impairment (‹6/18 to 6/60), severe vision impairment (‹6/60 to 3/60). Blindness occurs when visual acuity is ‹3/60. From this theory, it can be said that

patients fall into the category of severe low vision. Visual acuity significantly impacts a patient's activities of daily living (ADL), including reading, mobility, and driving (Biggerstaff & Lin, 2018). Patients with low vision have difficulty in performing daily activities such as walking in public places, reading, cooking, seeing at night, bumping into objects, and difficulty in recognizing faces. In this study, several respondents had poor or severe vision, or even blindness in one or both eyes (visual acuity of 0). Patients admitted to having difficulty in some activities such as household chores, adjusting to bright and dim lights, and driving because they cannot see with one or both eyes. Individuals with glaucoma will experience a decrease in quality of life as the field of vision damage worsens (Founti et al., 2020).

The majority of glaucoma patients receiving treatment at the eye clinic of Balung Regional Hospital, Jember Regency, are women, totaling 66 individuals (68%). Similar to the study conducted by Ananda (2016), the majority of respondents were female, with 41 individuals (60.3%) being female. The study conducted by Dizayang et al. (2019) also showed similar results with the dominance of females, totaling 26 individuals (57.8%). According to the National Eye Institute, two out of every three cases of blindness or visual impairment occur in women. A study by the American Academy of Ophthalmology (AAO) shows that women are more likely to suffer from certain eye diseases, such as age-related macular degeneration (AMD), cataracts, glaucoma, and dry eye. This is in line with the theory by Vajaranant et al. (2010), stating that women are at higher risk of glaucoma due to changes in female sex hormones affecting IOP and vascular resistance, which may affect the circulation of the optic nerve head. In addition, estrogen hormones in women are also involved in increasing blood flow to the eyes, which is crucial in glaucoma patients because vascular dysregulation is a major risk factor for the development of glaucoma (Choi & Kook, 2015) dalam (Fotesko et al., 2022). However, unlike the study conducted by Siswoyo (2019), most of the respondents were male, totaling 38 individuals (52.1%). The study by Tham et al. (2014) describes that men are more likely to have Primary Open-Angle Glaucoma (POAG). The increasing elderly population and the rising cases of glaucoma and glaucoma-related blindness indicate that even elderly women have a higher risk of glaucoma.

The result of the study shows that the majority have completed primary education or equivalent, totaling 42

individuals (43.3%). This result is in line with the study by Siswoyo et al. (2018), with the highest number of respondents having completed primary education or equivalent, totaling 26 individuals (66.7%). However, unlike the study conducted by Nugroho et al. (2019), the majority of glaucoma patients had completed high school education, totaling 21 individuals (46.7%). Patient knowledge about glaucoma serves as a reference for early detection so that blindness or disease severity can be prevented (Siswoyo et al., 2018). Low education levels are at risk of lack of knowledge or information about glaucoma and are at risk of not understanding their health, thus unable to take immediate action to minimize symptoms or disturbances they are experiencing and unable to perform early detection. There is nothing that can be done to prevent glaucoma as it is an incurable disease, but it can be managed to prevent further damage through early detection and regular treatment.

The majority of glaucoma patients receiving treatment at the eye clinic of Balung Regional Hospital, Jember Regency, are not working/housewives, totaling 41 individuals (42.3%). Occupations related to physical activities affect IOP. IOP becomes lower after activities because there is an acceleration of increased water flow after physical activity (McMonnies, 2016). Individuals with low activity levels are at risk of developing glaucoma. This is the case with individuals who are not working with less activity compared to other jobs, thus there is a risk of developing glaucoma. The study results are in line with the study conducted by Siswoyo (2019), with the majority of respondents being retirees, totaling 24 individuals (32.9%), followed by not working or being housewives, totaling 22 individuals (30.1%). Patients who are not working or are housewives have a higher risk of developing glaucoma due to their low activity levels. Patients can still carry out their activities independently, with or without glasses, and with either one eye functioning well or both eyes no longer functioning.

The result of the study shows that all glaucoma patients receiving treatment at the eye clinic of Balung Regional Hospital, Jember Regency, have been suffering from glaucoma for more than 1 year. The same was shown by Siswoyo (2019) in his research, with 51 individuals (69.9%) suffering from glaucoma between the duration of illness and the quality of life of glaucoma patients. The duration of an individual's suffering from glaucoma indicates a good level of understanding and adaptation to their disease condition

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(Gupta et al., 2005). Patients who suffer from glaucoma for a longer period with slow disease progression will have more time to adapt to their condition, including performing daily activities.

Quality of Life of Glaucoma Patients

Based on the result of the study, the quality of life of glaucoma patients at the Balung Regional Hospital Eye Clinic in Jember Regency is mostly categorized as good, with 49 individuals (50.5%). Meanwhile, 48 individuals (49.5%) showed a less of quality of life. The influence of glaucoma on quality of life can be indicated by the decrease in NEI-VFQ 25 composite scores. In this study, the mean composite score (mean ± SD) was 66.82 ± 17.80, covering the physical, psychological, social, and environmental health domains with 12 subscale indicators including general health, general vision, ocular pain, near vision, distance vision, social functioning, mental health, role difficulties, dependency, driving, color vision, and peripheral vision. This score is almost similar to similar quality of life research in China with a mean composite score (mean ± SD) of 71.88 ± 17.66 in 428 glaucoma patients (Wu et al., 2019). The study in India showed higher values compared to this study with a mean composite score (mean ± SD) of 74.4 ± 18.6 in 200 glaucoma patients (Kalyani et al., 2020). As the disease progresses, visual function deteriorates, making it increasingly difficult for patients to perform basic activities such as driving, reading, and socializing. This will disrupt psychological thinking and confidence, leading to worse quality of life scores.

Quality of life is a subjective perception of well-being and health experiences. The difference between respondents with good and less quality of life is relatively small, almost similar. This is influenced by several subscales with decreased scores, where the values of these subscales mutually influence each other because in the end, composite scores are sought by summing these subscales and then averaging them, except for the general health subscale (Mangione, 2000). If there are subscales showing lower scores, it can affect patient quality of life values. Most respondents show good quality of life because they are satisfied with their health despite disturbances in their vision and accept their condition sincerely. Respondents also still carry out their activities independently, with or without glasses, and with either one eye functioning well or both eyes not functioning.

The physical domain consists of 3 subscales including general health, general vision, and ocular pain, each with patients'

quality of life categorized as good. In the physical domain, the most patients in the good quality of life category are in the general vision subscale, totaling 88 individuals (90.7%), while the least is in eye pain with 57 individuals (58.8%). This indicates that in the physical domain, many problems related to ocular pain are still found. In line with literature study by Khachatryan et al. (2021) which reported that visual acuity and visual field have the weakest relationship with general health and eye pain in quality of life. In this study, 55.7% of patients experienced moderate discomfort in the eyes, sometimes interfering with daily activities. In the ocular pain subscale, the higher the answer score, the less ocular pain is felt. Ocular pain is part of the clinical manifestation of glaucoma. Ocular pain is caused by the expansion of ocular tissues including the cornea, iris, and entire eyeball (Perdami, 2018). Unlike the results of the study by Huang et al. (2020) which found that NEI VFQ 25 scores for eye pain were significantly lower in the glaucoma group compared to the normal group (Huang et al., 2020). If patients experience symptoms or complaints causing ocular pain, they should immediately undergo examination or comply with treatment to stabilize their eye pressure so that it does not increase and complaints like ocular pain can be minimized. Patients should not underestimate the symptoms they experience no matter how mild they are.

The psychological domain consists of 1 subscale, namely mental health. In this subscale, glaucoma patients have a good quality of life. Glaucoma patients have good mental health. Unlike the study conducted by Saswati et al. (2023) which concluded that topical and systemic side effects, medication, regimen complexity, and fear of blindness affect quality of life and cause psychological pressure. In this study, patients did not appear overly anxious, nervous, or sad because they claimed to have made peace with their health condition, including their vision condition, and began to accept and be grateful for their condition. It is possible that patients with slowly progressive glaucoma have enough time to develop coping strategies to overcome their functional status failure. Conversely, patients with rapidly progressive glaucoma may have less time to adapt to the decline in daily activities, thus contributing to a worse quality of life (Khachatryan et al., 2021). There was no significant difference between good and lesser quality of life in this subscale. Each patient has different coping and adaptation related to their condition. In addition, most patients have shown a good understanding of glaucoma

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so that anxiety and fear of blindness decrease over time because patients trust the treatment they undergo and can adapt to the diagnosis.

The social domain consists of 3 subscales including social functioning, role difficulties, and dependency. Of these three subscales, two subscales with less quality of life were found, namely social functioning and dependency. This is different from the study conducted by Huang et al. (2020) which showed that NEI-VFQ 25 scores for social functioning were significantly lower in the glaucoma group compared to the normal group. Meanwhile, in literature study by Khachatryan et al. (2021) it was found that mental health, role difficulties, and dependency were the most affected domains in quality of life. Extreme vision difficulties are the most common complaint in glaucoma. Glaucoma patients report difficulties in living independently due to difficulties in reading, walking, and driving (Ramulu, 2009; Huang et al., 2020). Bilateral glaucoma is also associated with a decrease in driving ability, hitting objects, walking slowly, and falling which adversely affect social activities. This will limit their physical activities and thus worsen their quality of life (Huang et al., 2020). Social functioning and dependency contribute to lesser quality of life because social interaction and independent activities are limited due to decreased vision conditions. Worse things can be associated with a decline in the ability to complete daily activities. Difficulties related to dependency can worsen when going out and walking.

The environmental domain consists of 5 subscales including near vision, distance vision, driving, color vision, and peripheral vision. In the environmental domain, there are 3 subscales with less quality of life. Of these 3 subscales, the most patients in the lesser quality of life category are in the driving subscale, with all patients having lesser quality of life and 57 individuals or 58.8% not actively driving, either stopping driving after being diagnosed with glaucoma or unable to drive at all. Driving is an activity that requires good binocular vision function, good scotopic vision, and higher functions such as contrast sensitivity, especially when driving at night (Kalyani et al., 2020). However, less quality of life in the driving subscale here is not entirely influenced by glaucoma factors. Near vision also found problems in this domain. This can happen because glaucoma damage in each eye inhibits the sensory integration of monocular visual stimuli and this causes a decrease in binocular vision. Although initially very gradual, the loss of

binocularity can explain the physical limitations observed in patients due to its negative impact on visual performance (Reche-Sainz et al., 2013). Near vision includes questions about reading newspapers, doing household or carpentry work such as cooking, sewing, and finding something in a crowded place. Increasing patient awareness of possible difficulties can also trigger more responsible behavior when driving or engaging in other potentially hazardous activities. These difficulties can stimulate the need for environmental changes at home to prevent accidents or falls and improve comfort.

The implication of nursing in this study is As educators, nurses can provide information on follow-up actions to maintain a good quality of life for patients. Additionally, nurses can offer information about glaucoma, especially concerning the most problematic indicator found in this study, which is near vision. Nurses can deliver care by involving the family in the entire patient care process to improve the quality of life for patients with lower scores. Families also need to be educated about physical, psychosocial, and environmental support.

5. CONCLUSIONS

The results obtained from this study are the characteristics of glaucoma patients at Balung Regional Hospital in Jember Regency. The mean age of respondents was 59 years, the mean visual acuity of the right eye was (0,1379) and visual acuity of the left eye (0,1429), the majority were female, with elementary/ equivalent education level, did not work or were housewifes, all of the patients had suffered from glaucoma more than 1 years. The quality of life in glaucoma patients is in good category. In the physical domain, problems were found related to the eye pain subscale. In the psychological domain, no issues were found as glaucoma patients have good mental health. In the social domain, problems were found related to social functioning and dependency. In the environmental domain, problems were found related to driving and near vision.

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AUTHOR CONTRIBUTIONS

Substantial contributions to conception, data collection, and analysis: Siswoyo, Ana Nistiandani, and Zhindy

Sinura. Writing manuscript and revisions: Siswoyo, and Zhindy Sinura.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions.

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