

Anxiety and Quality Of Life in Iranian Patients with Glaucoma

Parvin Dibajnia ^a, Hossein Mohammad Rabie ^b, Mohammad Aghazadeh Amiri ^c, Seyed Mohammad Tabatabaei ^d, Kobra Pourjam ^{e*}

^a Department of Psychiatry, School of Rehabilitation, Shahid Beheshti University of Medical Sciences, Tehran, Iran; ^b Department of Ophthalmology, Torfeh Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran; ^c Department of Optometry, School of Rehabilitation Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran; ^d Department of Biostatistics, School of Rehabilitation Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran; ^e Student Research Committee, MSc in Optometry, School of Rehabilitation, Shahid Beheshti University of Medical Sciences, Tehran, Iran

* **Corresponding author:** Kobra Pourjam, Student Research Committee, MSc in Optometry, School of Rehabilitation, Shahid Beheshti University of Medical Sciences, Tehran, Iran; **E-mail:** Ahrary.s@gmail.com

Submitted: 2022-08-21; **Accepted:** 2022-12-18; **Doi:** <https://doi.org/10.22037/jcpr.v8i1.45170>

Abstract

Introduction: To determine the prevalence for anxiety disorder among patients with glaucoma in Tehran, Iran, while assessing the relationship between quality of life (QOL) and anxiety. **Methods:** In this cross-sectional study, patients with glaucoma age 40 and above with a known diagnosis of primary open-angle glaucoma or primary angle-closure glaucoma were recruited from a tertiary care hospital. This study excluded patients with other types of glaucoma, as well as coexisting ocular or psychiatric disorders. Ophthalmic examination was carried out on all participants. This examination included Best-Corrected Visual Acuity (BCVA), Intraocular Pressure (IOP), standard automated perimetry, and optic disc evaluation. Sociodemographic information was also carried out. The anxiety questionnaire derived from questions in DASS-21 questionnaire, the Visual Function Questionnaire (VFQ25) were administered to evaluate anxiety and the impact on QOL respectively. **Results:** A total of 204 patients were included in this study. The mean (SD) of age was 58.9 (11.96) years (range, 40 to 85). The frequency of anxiety among our patients was 51.0%. The mean (SD) of Anxiety score was 9.13 (8.724) (range, 0 to 36). The mean (SD) score of VFQ25 was 79.83 (19.77) (range, 8.19 to 100). The poorest subscale on the VFQ25 was general health with a mean (SD) score of 66.36±19.44 (range, 0.0 to 100.0). **Conclusion:** this study found that 51.0% of patients with glaucoma had anxiety disorder, which significantly affected their QOL. The VFQ25 indicated the general health subscale had the poorest score, suggesting its impact on patients' well-being.

Keyword: Anxiety; DASS-21; Glaucoma; Health-Related Quality Of Life; HRQOL; Life Quality; VFQ-25

Please cite this paper as: Dibajnia P, Rabie HM, Aghazadeh Amiri M, Tabatabaei SM, Pourjam K. Anxiety and Quality Of Life in Iranian Patients with Glaucoma. J Clin Physio Res. 2023; 8(1): e78. Doi: <https://doi.org/10.22037/jcpr.v8i1.45170>

Introduction

Glaucoma is a progressive eye disease that results in irreversible optic neuropathy and can result in progressive reduction of visual acuity and even complete blindness. The most important known risk factor is an increase in intraocular pressure and consequently a decrease in fluid output from the eye filtration angle (1). Glaucoma is the second leading cause of blindness after cataract in the world. It is a much bigger challenge for society because the blindness cannot be reversed (2). Overall, studies on the prevalence of glaucoma in Iran have shown that the incidence of this disease in the Iranian population is higher than the average incidence rate in East Asia (3.75% than 3.40%) (3, 4). As the disease progressively affects the vision and consequently the patient's life, and there is no definitive treatment, these patients are forced to live with the impaired vision and suffer psychological, social, causing difficulties in daily activity.

They are then at risk of anxiety (5-7) which affects their QOL. Therefore, in addition to routine clinical examinations and self-assessment of visual function, QOL is considered an important factor in the treatment of glaucoma (8).

The term "quality of life" (QOL) is defined by the World Health Organization as the subjective perception of well-being and wholeness (9). It is a broad concept that is affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationship with salient features of their environment.

In response to a need for a vision-targeted measure of QOL, the National Eye Institute (NEI) funded the development of Visual Functioning Questionnaire 25 in the mid-1990s (10, 11).

The last version of National Eye Institute Visual Functioning Questionnaire 25 (VFQ-25) has been standardized in several languages including Farsi (9). There are several studies that have studied the frequency of anxiety and QOL in

people with glaucoma (5, 7, 12-15). Due to different cultural and social differences and lack of similar study in Iran, it seems that studies in this field of context is important.

Materials and Methods

In this cross-sectional study, patients with glaucoma were recruited from Torfeh Hospital (Tehran), from March 2018 to April 2018. Informed consent was taken from all participants before enrollment. Our study was approved by the local institutional review board.

Glaucoma was diagnosed by an ophthalmologist based on glaucomatous disc cupping and characteristic visual field defects in one or both eyes, with or without increased intraocular pressure (IOP). Inclusion criteria consisted of patients aged 40 years and above with a known clinical diagnosis of glaucoma. Patients with coexisting ocular disease i.e. cataract, diabetic retinopathy, age-related macular degeneration were excluded. We also excluded patients who had coexisting physical and psychiatric disorders i.e. depression/anxiety.

Patients' field of vision was measured using Humphrey device and SITA-standard 24-2 program. According to the glaucoma staging system (GSS) developed by Nelson and colleagues, they were classified into 3 groups: "mild" (unilateral loss of less than a half of the visual field), "moderate" (unilateral loss of more than half of the visual field, or bilateral loss of less than a half of the visual field in each eye), or "severe" (bilateral loss of more than half of the visual field in either eye). This GSS has been shown to correlate strongly with parametric MD (14).

NEIVFQ-25 questionnaire

Patients completed NEIVFQ-25 questionnaire in Farsi. NEIVFQ-25 questionnaire is useful, acceptable, and valid for assessing the QOL of patients with chronic ophthalmic diseases including glaucoma (16).

The VFQ-25 generates the following vision-targeted subscales (the number of questions or items in each subscale are indicated in parenthesis):

Global vision rating (1), difficulty with near vision activities (3), difficulty with distance vision activities (3), limitations in social functioning because of vision (2), role limitations because of vision (2), dependency on others because of vision (3), mental health symptoms because of vision (4), driving difficulties (3), limitations with peripheral (1) and color vision (1), and ocular pain (2).

The NEIVFQ has been shown to be reliable and valid among persons with glaucoma (17, 18) and can be used as a benchmark against which more specific glaucoma QOL tools are compared. One advantage of using a more generalized tool such as the NEIVFQ25 is the ability to directly compare the

relative burden of one condition with another; for example, cataract and glaucoma (19).

The NEIVFQ25 questionnaire was scored using the scoring algorithm recommended by the Research and Development Corporation. This involved scoring the items within the domains and then finding the average score for each domain. The minimum score for each item was 0 and the maximum score was 100. The NEIVFQ25 summary score was the average of the scores for the domains excluding the general health domain. (19)

Anxiety Questionnaire

The questionnaire consists of seven Anxiety questions from the DASS-21 Questionnaire. The DASS-21 questionnaire is a self-reported tool with 21 questions and 3 subscales of depression, anxiety, and stress, each containing 7 questions. The final score of each is obtained by summing the scores on the questions. Each question is scored from zero (does not apply to me) to three (absolutely true). Since the DASS-21 is a shortened form of the original scale (42 questions), the final score was doubled for each subscale to determine symptom severity. This questionnaire has been validated and verified in Iran (20, 21).

A score of 0 to 9 from the Anxiety Questionnaire equals the normal score and scores of 9 and above indicates different degrees of anxiety (10 to 13 mild, 14 to 20 moderate, 21 to 27 severe, and more than 28 highly severe).

Statistical Analysis

Data analysis was carried out using IBM SPSS Statistics (Version 18.0; IBM Corp., Armonk, NY). Continuous variables were compared using the Mann-Whitney and Kruskal-Wallis nonparametric. Whereas categorical variables were compared using the Pearson χ^2 test. A P-value of <0.05 was considered to indicate statistical significance.

Results

Demographics and Clinical Features

Table 1 shows the demographics and clinical characteristics of participants. A total of 204 eligible patients (102 males and 102 females) were agreed to participate. The mean (SD) age of the sample population was 58.2 ± 11.96 years (range, 40 to 89 y).

Prevalence of Anxiety Disorder

Among the participants in our study, 51.0% had anxiety disorder. The mean (SD) of Anxiety score was 8.724 ± 9.13 with a range of 36 (lowest to 0 and highest to 36). Of the 204 participants, 100 (49.0%) had an anxiety score less than 7, which was classified as normal. Another 104 (51.0%) were classified in the anxiety group.

Table 1. Demographic features and clinical characteristics of 100 patients with glaucoma (n=100)

Features	Mean (SD) [Range]
Age (y)	58.02 (11.959) (40-85)
Sex (n)	Male 102 Female 102
Marital status (n)	Single 59 Married 128 Divorced/separated/widowed 17
Log MAR best-corrected visual acuity	Better eye 0.1289 (0.2501) [0.0-0.875] Worse eye 0.4260 (0.6988) [0.0-3.0]
MD of HFA24-2 (dB)	Better eye 4.9811 (10.4538) [31.4 to 7.56] Worse eye 10.4891 (9.8112) [33.9 to 0.77]
Type of glaucoma (n)	POAG 142 PACG 62
Glaucoma stages (n)	mild 93 moderate 57 severe 54
Mean Anxiety score	9.13 (8.724) [0-36]
Frequency of anxiety (n)	104

ACG, angle-closure glaucoma; POAG, primary open-angle glaucoma; VFQ25, Visual Function Questionnaire

Table 2. VFQ25 subscales mean scores and range

VFQ25 subscales	Mean (SD)	Range (Min-Max)
General health	63.36 (19.44)	0-100
General vision	65.49 (19.27)	0-100
Ocular pain	71.22 (20.89)	10-100
Near activities	83.16 (24.73)	0-100
Distance activities	81.05 (23.91)	0-100
Social functioning	90.62 (17.98)	25-100
Mental health	67.89 (30.31)	0-100
Role difficulties	73.28 (29.59)	0-100
Dependency	84.68 (28.47)	0-100
Driving	84.37 (25.73)	0-100
Peripheral vision	88.24 (22.52)	0-100
Color vision	93.20 (18.50)	0-100
Mean VFQ25 score	79.83 (19.77)	8.19-100

QOL

The mean (SD) score of NEIVFQ-25 was 79.83±19.77 with a range of 91.81 (lowest 8.19 to highest 100). The lowest score for general health was 66.36 19. 19.44 And the highest for color vision was 93.5±18.2 respectively.

To improve the data analysis process, the obtained QOL scores were divided into two groups: high QOL score (QOL above average) and low QOL (below average) (Tables 2 and 3).

Kruskal-Wallis test was used to compare anxiety score and QOL, for each subgroup of QOL. The score was divided in three groups: 1: mild, 2: moderate, 3: severe. The results showed that there was a significant difference ($P<0.001$) between the two items in the 2% confidence level. Mann-Whitney test was used to compare groups in two categories, the results are as follows:

A) The quality-of-life score was significantly different in the

mild to moderate group ($P<0.05$). The mean scores of all items were significant in the two groups of mild and moderate glaucoma, except Social functioning ($P=0.089$), peripheral vision ($P=0.191$), color vision ($P=0.927$) and driving ($P=0.129$). In the rest of the subgroups, individuals in the mild group had higher mean scores than the average group ($P<0.05$).

B) The mean scores of all items in the two groups of mild and severe glaucoma were significant ($P\leq 0.001$). Subjects in the mild group had higher mean scores than the mild group.

C) The difference between the mean score of QOL in the two groups of moderate and severe glaucoma was significant ($P<0.001$). The mean score of all items in the subgroup of the QOL except the general health item was significantly different ($P<0.05$). The subjects in the middle group had higher mean scores than the severe group.

D) There was a significant difference between the mean score of anxiety in the two groups of mild and moderate glaucoma ($P=0.012$) and the two groups of mild and severe glaucoma ($P<0.001$). The mean difference between the two groups was not significant ($P=0.237$).

E) Subjects in the mild group had lower mean anxiety score than the other two groups. The difference between the mean score of anxiety ($P=0.013$) was significant in the two groups of men and women.

F) Overall QOL score was also significant in both groups ($P=0.022$). Mean scores were significant only in the subgroups of eye pain ($P=0.033$), psychological problems ($P=0.001$) and role playing (0.026). Women in all three subgroups had lower mean scores (Table 4).

Table 3. Mean (SD) score of anxiety, depression and QOL in different glaucoma groups

Variables	Mild	Moderate	Sever	P-value
Anxiety	7.327(6.67)	8.81(10.28)	9.721 (12.26)	<0.001
Quality of life	11.23 (89.46)	13.15 (81.59)	24.13 (61.38)	<0.001

Table 4. Mean (SD) scores of anxiety, depression and QOL in both men and women

Variables	Men (SD)	Women	P-value
Anxiety	7.98 (8.86)	10.27 (8.46)	0.013
QOL	81.53 (20.06)	78.13 (19.41)	0.022

G) We used Pearson correlation test to investigate the relationship between the severity of anxiety and the patients' age. Result shows that the average anxiety score increases with age. To investigate the relationship between anxiety and gender, patients were divided into two groups: normal and abnormal. Chi-square test revealed that there was a relationship between anxiety and sex ($P=0.036$). 58.8% of women reported anxiety disorder, while only 43.1% of men reported the same.

Discussion

In our study the mean score of QOL in the NEIVFQ-25 questionnaire was 79.73 ± 19.77 . In China it was 70.60 ± 15.23 (22) and in Italy it was 81.6 ± 15.1 (23). This average was reported in Singapore at 78.8 ± 16 , 69.8 ± 1.9 , in Japan 69.2 ± 20.4 , and in Taiwan (13, 24, 25). Iranian patients with glaucoma had higher QOL compared to retinitis pigmentosa (RP) patients in Azizi et al. (26) study (47.59 ± 18.72) but had lower QOL compared to normal Iranian subjects in their study (92.29 ± 5.84).

The above comparisons showed that the QOL of these patients in Iran is at an acceptable level compared to the world although the prevalence of anxiety in patients was 51%. Studies in Iran show that the prevalence of anxiety disorder in Iranians is 14.6 (22), And that means that patients with glaucoma are several times more likely to develop anxiety disorder than normal people.

Compared to other countries, the prevalence of anxiety in this study was 51%, which is higher than Pakistan (33%), China (22.92%), Turkey (13.5%) and Japan (13%) but less than Singapore (64%) (7, 8, 12, 14, 23, 24). The prevalence rate may be due to study design. The studies used different anxiety scales than our study. However, the high prevalence of anxiety among patients with glaucoma seems to be alarming. It is therefore advisable to have patients with glaucoma receive psychiatric examinations and to be referred promptly if necessary.

Prevalence of anxiety was 40.9% in mild glaucoma group, 56.1% in moderate glaucoma and 63.0% in severe glaucoma. For example, the study by Zhou and et al. (24) showed that

young age is an independent predictor of anxiety. Contrary to Zhou's research, the mean anxiety was higher in the age group of 70 than in the group under the age of 70 (18.0 ± 10.37 vs. 8.23 ± 8.9). This may be due to the older age groups fear of disability and blindness, which leads to a decrease in individual independence and an increased financial burden on the household. Our study also showed that although the level of anxiety in women was higher, the severity of anxiety was not related to gender.

In recent articles, Lesin et al. (25) concluded that no association was found between their participants' anxiety symptoms and glaucoma signs in the worse eye, while in this study as well as the study by Shin et al. (26), it was concluded that there is a correlation between the rate of disease progression and anxiety. On the other hand, Wu et al. (27) demonstrated that psychological distresses among glaucoma patient depends on the quality of life, rather objective function components, like BCVA.

Conclusion

To enhance the well-being of glaucoma patients, particularly women, addressing anxiety is crucial. Improving their QOL involves teaching patients to utilize head and eye movements, visual aids like magnifying glasses, and increasing accessible rehabilitation centers. Regular examinations are essential for early diagnosis and preventing disease progression. Additionally, implementing short questionnaires in clinics can help identify anxiety cases and guide patients to specialized consultations.

Acknowledgments

The presented article is taken from the Master's thesis (Optometry) of Kobra Pourmaj under the guidance of Dr. Mohammad Aghazadeh Amiri and Dr. Hossein Mohammad Rabi. The authors thank the sincere cooperation of the Torfeh Hospital Clinical Research Development Office, Torfeh Hospital staff (Shahid Beheshti University of Medical Sciences) as well as all respected participants in the present study.

Ethical considerations

This study was conducted following all relevant ethical guidelines and regulations to ensure the protection of participants' rights and confidentiality.

Funding support

None.

Conflict of interest

None.

Authors' contributions

All authors contributed equally to the preparation of this manuscript.

References

1. Kanski JJ BB. Clinical ophthalmology: a systematic approach. . six ed: Elsevier Health Sciences; 2008.
2. Kingman S. Glaucoma is second leading cause of blindness globally. *Bull World Health Organ*. 2004;82(11):887-8.
3. Pakravan M, Yazdani S, Javadi M-A, Amini H, Behrooz Z, Ziaei H, et al. A Population-based Survey of the Prevalence and Types of Glaucoma in Central Iran: The Yazd Eye Study. *Ophthalmology*. 2013;120(10):1977-84.
4. Shahdadi H, Rafiemanesh H, Balouchi A. Prevalence of Glaucoma in Iran: a systematic review and meta-analysis 2018. 490-7 p.
5. Cumurcu T, Cumurcu BE, Celikel FC, Etikan I. Depression and anxiety in patients with pseudoexfoliative glaucoma. *General Hospital Psychiatry*. 2006;28(6):509-15.
6. Zhang X, Olson DJ, Le P, Lin F-C, Fleischman D, Davis RM. The Association Between Glaucoma, Anxiety, and Depression in a Large Population. *American Journal of Ophthalmology*. 2017;183:37-41.
7. Tastan S, Iyigun, E., Bayer, A., & Acikel, C. Anxiety, depression, and quality of life in Turkish patients with glaucoma. . *Psychological reports*. 2010;106((2)):343-57.
8. Wang SY, Singh K, Lin SC. Prevalence and Predictors of Depression Among Participants With Glaucoma in a Nationally Representative Population Sample. *American Journal of Ophthalmology*. 2012;154(3):436-44.e2.
9. Anonymous. Study protocol for the World Health Organization project to develop a Quality of Life assessment instrument (WHOQOL). . *Qual Life Res*. 1993;2:153-9.
10. Mangione CM BS. Identifying the content area for the 51-item National Eye Institute Visual Functioning Questionnaire: results from focus groups with visually impaired persons. *Arch Ophthalmol* 1998; 116:227-33.
11. Mangione CM LP, Pitts J, Gutierrez P, Berry S, Hays RD. Psychometric properties of the National Eye Institute Visual Function Questionnaire (NEI-VFQ). NEI-VFQ Field Test Investigators. *Arch Ophthalmol*. 1998;116:1496-504.
12. Fasih U, Hamirani MM, Jafri AR, Riaz SU, Shaikh A. Assessment of anxiety and depression in primary open angle glaucoma patients (a study of 100 cases). *Pak J Ophthalmol*. 2010;26(3):143-7.
13. Lim NCS, Fan CHJ, Yong MKH, Wong EPY, Yip LWY. Assessment of Depression, Anxiety, and Quality of Life in Singaporean Patients With Glaucoma. *Journal of Glaucoma*. 2016;25(7):605-12.
14. Mabuchi F, Yoshimura K, Kashiwagi K, Shioe K, Yamagata Z, Kanba S, et al. High prevalence of anxiety and depression in patients with primary open-angle glaucoma. *Journal of glaucoma*. 2008;17(7):552-7.
15. Rezapour J, Nickels S, Schuster A, Michal M, Munzel T, S. Wild P, et al. Prevalence of depression and anxiety among participants with glaucoma in a population-based cohort study: The Gutenberg Health Study 2018.
16. Asgari S, Nedjat S, Hashemi H, Shahnazi A, Fotouhi A. Quality of Life in the Group of Patients with Chronic Eye Disease. *Iranian Journal of Epidemiology*. 2012;7(4):43-8.
17. Lester M ZM. Quality of life in patients with early, moderate and advanced glaucoma. . *Eye*. 2002;16:44-9.
18. Gutierrez P WM, Johnson C, et al. Influence of glaucomatous visual field loss on health-related quality of life. *Arch Ophthalmol* 1997;115:777-84.
19. Onakoya AO, Mbadugha CA, Aribaba OT, Ibidapo OO. Quality of Life of Primary Open Angle Glaucoma Patients in Lagos, Nigeria: Clinical and Sociodemographic Correlates. *Journal of Glaucoma*. 2012;21(5):287-95.
20. Asgari A., Saed F., Dibajnia P., . Psychometric properties of the Depression, Anxiety Scale -21 (DASS-21) in a non clinical Iraian sample. *International Journal of Psychology*. 2008;4(2):82-102.
21. Asghari Moghaddam MA, Saed F, Dibajnia P, Zangeneh J. A Preliminary Validation of the Depression, Anxiety and Stress Scales (DASS) in Non-clinical Sample. *Clinical Psychology & Personality*. 2009;1(31):23-38.
22. Latest statistics on mental disorders in the country [Internet]. 2019. Available from: <https://www.tabnak.ir/fa/news>.
23. Skalicky S, Goldberg I. Depression and Quality of Life in Patients With Glaucoma: A Cross-sectional Analysis Using the Geriatric Depression Scale-15, Assessment of Function Related to Vision, and the Glaucoma Quality of Life-15. *Journal of Glaucoma*. 2008;17(7):546-51.
24. Zhou C, Qian S, Wu P, Qiu C. Anxiety and depression in Chinese patients with glaucoma: Sociodemographic, clinical, and self-reported correlates. *Journal of Psychosomatic Research*. 2013;75(1):75-82.
25. Lešin Gačina D, Jandroković S, Marčinko D, Škegro I, Vidas Pauk S, Tomić M, et al. Anxiety and treatment adherence among glaucoma patients during COVID-19 pandemic and earthquakes in Croatia. 2022;34(2):348-55.
26. Shin DY, Jung KI, Park HYL, Park CKJSR. The effect of anxiety and depression on progression of glaucoma. 2021;11(1):1769.
27. Wu N, Kong X, Gao J, Sun XJJoG. Vision-related quality of life in glaucoma patients and its correlations with psychological disturbances and visual function indices. 2019;28(3):207-15.