HEALTH-RELATED QUALITY OF LIFE IN PRIMARY OPEN-ANGLE GLAUCOMA PATIENTS

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SUMMARY – The purpose of this research was to evaluate the relationship between general health-related quality of life (GHRQL) and sociodemographic factors in primary open-angle glaucoma (POAG) patients. A prospective cross-sectional study included 207 glaucoma patients. GHRQL was determined via two self-administered questionnaires: the 36-Item Short Form Survey (SF-36) and the EuroQol-5D (EQ-5D) questionnaire. Male and 50- to 69-year-old glaucoma patients, followed by patients who regularly used antiglaucoma therapy and those without progression of glaucoma reported a significantly higher quality of life as measured by the EQ-5D index and the EQ-5D visual analog scale (VAS) (p<0.05 all). Similarly, the Physical Component Summary (PCS) and Mental Component Summary (MCS) of SF-36 had significantly higher values for these patients (p<0.05 all). Furthermore, glaucoma patients with higher education and economic status, glaucoma patients who lived in rural areas, and those who were married achieved higher scores on EQ-5D and SF-36. In conclusion, progression of the disease, female sex, older age, lower education and economic status, urban area and unmarried status negatively affect quality of life in glaucoma patients.

Key words: Glaucoma; Health-related quality of life; Sociodemographic factors

Introduction

Glaucoma with a prevalence of around 2% in persons older than 40 years is the second most common cause of blindness worldwide. It has a significant impact on the economy and healthcare system due to the increased treatment expenses and incidence of disability1-3. It is estimated that primary open-angle glaucoma (POAG) as the most common form of the disease will affect approximately 80 million individuals by 2020 and over 110 million people by 20404,5. Since glaucoma can influence general health-related quality of life (GHRQL) and vision-related quality of life (VRQL) via mode of treatment and as a result of visual impairment, determination of the general health status and visual status of these patients can be of great significance6,7. A combination of sociodemographic indicators, clinical examination and questionnaires that measure quality of life enables clinicians to better estimate the influence of glaucoma seriousness on the patient quality of life. This can help achieve better patient education and compliance, as well as helping select optimal treatment6. Loss of vision negatively affects the patient quality of life and psychosocial status, and vice versa, patients with lower psychosocial status and poorer quality of life show poorer outcomes of glaucoma treatment. Despite the significant progress achieved in recent years, insufficient compliance of patients with respect to their physicians or prescribed therapies is a significant limiting factor in the treatment of glaucoma8,9. There are many difficulties regarding patient compliance, such as long-term treatment, environmental factors, difficulties in drug use, forgetfulness, lack of discipline, lack of understanding that glaucoma is a serious illness, poor communication
with the doctor, high prices and side effects of ocular medicines, etc.\textsuperscript{13-15}. Thus, improvements in communication between patients and ophthalmologists and better understanding of the nature of POAG may considerably increase regularity of taking antiglaucoma medications\textsuperscript{16,17}.

Surveys conducted in India and Spain showed that poorer economic status, lower education level, female sex and older age contributed directly to poorer quality of life in glaucoma patients\textsuperscript{18,19}. Buys \textit{et al.} and Jones \textit{et al.} showed that socioeconomic deprivation and visual field (VF) worsening were associated with greater severity of glaucoma at presentation and a decline in VRQL\textsuperscript{20,21}. It has been shown that quality of life is negatively associated with the frequency of depression and anxiety, especially in female and unmarried patients with POAG\textsuperscript{22}. Labiris \textit{et al.} showed that urban residence was associated with a tendency towards beneficial effects on the ‘Distant activities’ and ‘Social functioning’ subscales of the vision-specific quality of life measure\textsuperscript{23}. To our knowledge, no published data are available regarding the impact of glaucoma on the quality of life of people living in Bosnia and Herzegovina.

Considering the above-mentioned issues, our research was conducted with the aim of determining the relationship between subjective estimation of the health condition of POAG patients and disease progression and sociodemographic factors.

### Patients and Methods

#### Patients

A prospective, cross-sectional study was conducted at the Department of Ophthalmology, Mostar University Hospital, Mostar, Bosnia and Herzegovina, between June 2018 and June 2020. A total of 207 patients with POAG were included in the study. The inclusion criteria were as follows: diagnosis of POAG (increased intraocular pressure (>21 mm Hg), typical glaucomatous defects in VF, optic disk lesions and open angle of anterior chamber), patients over 50 years of age, existence of glaucomatous defects in VF up to 12 dB (mean defect (MD) <12 dB) and cataract up to C2NC2P2 level, since higher opacity in the lens significantly decreased visual acuity and contributed to VF defects. Patients were excluded from the study if they presented any of the following: surgical and/or laser procedures on an eye, all types of glaucoma except for POAG, cataract of higher level than C2NC2P2, corneal and retinal pathology that significantly reduced visual acuity, and advanced stage of glaucoma (MD >12 dB). Patients who met the inclusion criteria were interviewed and gave written informed consent prior to participation in the study. All procedures and examinations were approved by the Ethics Committee of the Mostar University Hospital. The study was conducted in compliance with the Declaration of Helsinki.

#### Clinical evaluation

All participants underwent a standard ophthalmologic examination that included uncorrected and best-corrected visual acuity, applanation tonometry, pachymetry, gonioscopy, slit lamp inspection, and dilated fundus examination. VF defects were detected by static perimetry with an Octopus 900 PRO device (Haag-Streit, Koeniz, Switzerland) using G TOP/White/White standard program. Images were analyzed using the MD and pattern standard deviation (PSD) parameters of VF defects. Measurements of cup–disk ratio and peripapillary retinal nerve fiber layer (RNFL) thickness were performed using a Cirrus spectral-domain, high-definition optical coherence tomography device (OCT, Carl Zeiss Meditec Inc., Dublin, CA, USA). The patients included in the research were invited for follow-up examinations at 6, 12 and 18 months after initial ophthalmologic examination. Every check-up included complete ophthalmologic examination, VF recording and OCT of the optic nerve, and peripapillary RNFL. After final follow-up examination at 18 months, patients were divided into two groups of patients with and without POAG progression according to the criteria for glaucoma progression established by Hodapp \textit{et al.}\textsuperscript{24}.

#### Instruments used on data collection

All respondents filled out three questionnaires, i.e. general questionnaire on sociodemographic data (sex, age, educational level, personal income, place of residence and marital status) and two questionnaires measuring GHRQL: the 36-Item Short Form Survey (SF-36) and the EuroQol-5D (EQ-5D) questionnaire. SF-36 is a set of generic, coherent and easily administered quality of life measures which rely upon patient self-reporting and are now widely utilized for
routine monitoring and assessment of care outcomes in adult patients. It is a short form survey of the Medical Outcomes Study, consisting of 36 questions. After completing this questionnaire, an eight-domain profile of functional health and benefit scores, as well as summarized measures of physical and mental health and a usefulness index based on health priorities, were created. Each domain included between 2 and 10 questions and each question had between 2 and 6 possible answers. The domains of physical functioning, restrictions due to physical health, bodily pain and general health created a summary scale measuring the Physical Component Summary (PCS), while the domains of vitality, social functioning, restrictions due to emotional problems and mental health created a summary scale measuring the Mental Component Summary (MCS).

The EQ-5D is a generic multidimensional questionnaire composed of two parts: the EQ-5D descriptive system (index) and the EQ-5D visual analog scale (EQ-5D VAS). Five dimensions were considered: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension has three levels: no problems, some problems, and severe problems. Each answer was converted to a single-digit number and the digits for each dimension were combined into a five-digit number describing the patient health state. This five-digit number was then elaborated using a unified scoring algorithm. The EQ-VAS cards measured self-reported general health status using a vertical thermometer-analog scale where the endpoints are labeled ‘best imaginable health state’ and ‘worst imaginable health state’.

With regard to the level of education, the respondents were divided into two groups by applying the International Standard Classification of Education (ISCED) 2011, the standard framework used to categorize and report cross-nationally comparable education statistics. Patients categorized as ‘lower education’ were those who had ISCED level 0 – early childhood education, ISCED level 1 – primary education and ISCED level 2 – lower secondary education. Patients categorized as ‘higher education’ were those who had ISCED level 3 – upper secondary education, ISCED level 4 – post-secondary non-tertiary education and ISCED levels 5–8, which describe various levels of tertiary (academic) education. The average personal annual income in Bosnia and Herzegovina for the years 2018 and 2019 was approximately 8,860.00 BAM (~5,000.00 USD).

Statistical analysis

Descriptive statistical methods were used for description of the frequency distribution for all variables analyzed. Continuous variables were expressed as mean ± standard deviation, while the values of categorical variables were expressed as N (%). Student’s t-test was used to compare continuous variables between groups. Logistic regression analysis was used to determine predictors of glaucoma progression. The odds ratios, confidence intervals and levels of significance were examined to evaluate the individual predictor variables. The level of statistical significance was set at p<0.05. Analyses were carried out using SPSS software version 20.0 (SPSS Inc., Chicago, IL, USA).

Results

A total of 207 respondents met the criteria for inclusion in the study, of which 80 (38.6%) were men and 127 (61.4%) were women. The mean age of patients with POAG was 68.52±9.10 years, ranging from 50 to 89 years. The SF-36 and EQ-5D instruments were used, where a higher score indicated higher quality of life for all described domains/scales of SF-36 and EQ-5D questionnaires.

Table 1 shows the EQ-5D-determined quality of life for patients with POAG with respect to sex, age, regularity of using antiglaucoma eyedrops, progression of disease, education level, economic status, area of living and marital status. From these results, it is clear that male and patients aged 50-69 years had a significantly higher quality of life, followed by patients who regularly used antiglaucoma therapy and those without progression of glaucoma, as measured by the EQ-5D index and EQ-5D VAS (p<0.05 all). Furthermore, glaucoma patients with a higher educational level and economic status, patients who lived in rural areas and those who were married achieved higher scores on EQ-5D. The difference was statistically significant for ‘Personal income’ as measured by the EQ-5D index (p=0.003) and EQ-5D VAS (p=0.001).

Table 2 shows the SF-36-determined quality of life for patients with POAG with respect to sex, age, regularity of using antiglaucoma eyedrops, progression of
Table 1. Quality of life in patients with POAG measured with EQ-5D

| Variable                  | n   | EQ-5D index | t-test | p   | EQ-5D VAS      | t-test | p   |
|---------------------------|-----|-------------|--------|-----|----------------|--------|-----|
| Sex                       |     |             |        |     |                |        |     |
| Male                      | 80  | 0.57±0.28   | 2.237  | 0.026 | 60.88±17.27   | 2.750  | 0.006 |
| Female                    | 127 | 0.50±0.27   |        |      | 56.04±16.60   |        |     |
| Age (yrs)                 |     |             |        |     |                |        |     |
| 50-69                     | 104 | 0.57±0.27   | 3.357  | 0.001 | 61.44±16.87   | 4.711  | 0.001 |
| 70                        | 103 | 0.47±0.26   |        |      | 53.78±16.17   |        |     |
| Topical AG therapy        |     |             |        |     |                |        |     |
| Regular                   | 141 | 0.54±0.27   | 2.797  | 0.005 | 58.91±16.54   | 3.405  | 0.001 |
| Non-regular               | 66  | 0.44±0.26   |        |      | 51.52±17.65   |        |     |
| Progression of disease    |     |             |        |     |                |        |     |
| Yes                       | 63  | 0.45±0.15   | 3.625  | <0.001 | 53.56±18.16   | 2.989  | 0.002 |
| No                        | 144 | 0.60±0.28   |        |      | 60.47±13.68   |        |     |
| Education                 |     |             |        |     |                |        |     |
| Lower qualification       | 135 | 0.52±0.22   | 1.220  | 0.223 | 57.36±16.48   | 0.796  | 0.130 |
| Higher qualification      | 72  | 0.57±0.27   |        |      | 60.00±20.71   |        |     |
| Personal income           |     |             |        |     |                |        |     |
| <5,000 USD                | 107 | 0.48±0.26   | 2.966  | 0.003 | 54.67±16.23   | 3.772  | 0.001 |
| ≥5,000 USD                | 100 | 0.56±0.25   |        |      | 60.80±17.17   |        |     |
| Area                      |     |             |        |     |                |        |     |
| Urban                     | 130 | 0.51±0.25   | 1.390  | 0.165 | 57.00±17.00   | 1.631  | 0.104 |
| Rural                     | 77  | 0.56±0.26   |        |      | 60.54±16.54   |        |     |
| Marital status            |     |             |        |     |                |        |     |
| Married                   | 124 | 0.54±0.27   | 1.349  | 0.178 | 59.51±17.90   | 1.582  | 0.112 |
| Unmarried                 | 83  | 0.50±0.27   |        |      | 56.81±15.04   |        |     |

POAG = primary open-angle glaucoma; EQ-5D = EuroQol-5D; n = number of patients; VAS = visual analog scale; AG = antiglaucoma

disease, education level, economic status, area of living and marital status. The PCS and MCS scales of SF-36 showed significantly higher scores in male and patients aged 50-69 years than in patients who regularly used antiglaucoma therapy and those without progression of glaucoma (p<0.05 all). Furthermore, glaucoma patients with a higher educational level and economic status, patients who lived in rural areas and those who were married achieved higher scores on the PCS and MCS scales of SF-36. Statistical significance was achieved for 'Area' on the MCS scale (p=0.004) and for 'Marital status' on the MCS scale (p=0.003).

Predictive factors for glaucoma progression are shown in Table 3. Considering all domains/scales of EQ-5D and SF-36, as well as all sociodemographic factors, the ‘Social functioning’ domain of SF-36 was found to be the only significant predictive factor for progression of POAG (OR=0.953; p<0.001).

Discussion

Glaucoma influences daily living both through visual impairment and as a result of the glaucoma treatment itself. Quality of life is a measure that is hard for medical experts to quantify but is very important for patients. In glaucoma patients, it is necessary to be familiar with perceptions of personal health and disabilities in everyday activities. Since glaucoma does not only affect vision-related daily functions, we used the SF-36 and EQ-5D questionnaires in our research, as these are the most commonly used instruments for the assessment of GHRQL.
The results of our study showed that male patients with POAG had a significantly higher quality of life than female patients with POAG. These results mostly correlate with the results of numerous studies undertaken worldwide\textsuperscript{19,21}. The data can be interpreted as indicating that females in the general population have a slightly poorer quality of life than males in all age groups. In addition, respondents aged 50-69 years had a significantly higher quality of life than patients older than 70 years. This finding was confirmed by other studies, as well as by the fact that age has been negatively correlated with quality of life in the general population\textsuperscript{25,26}.

Patients who regularly used antiglaucoma therapy achieved significantly higher scores on the EQ-5D and SF-36 questionnaires. The results of studies in France, China, USA and Brazil showed that the main factors influencing poor compliance between doctors and patients and irregular use of antiglaucoma drugs were insufficient information given to patients about the nature of glaucoma disease, problems in understanding and in communication with a doctor, problems with application of the eyedrops, and high prices and side effects of ocular medicines\textsuperscript{13-15,27}. All these factors essentially disrupt the quality of life in glaucoma patients, and therefore improvement in communication between physicians and patients, as well as improved patient knowledge about the course of the disease may significantly increase the regularity of taking antiglaucoma medicines\textsuperscript{16,17}. Furthermore, development of new antiglaucoma eyedrops (such as analogs of prostaglandins and fixed combinations) that de-

### Table 2. Quality of life in patients with POAG measured with SF-36

| Variable                     | n  | SF-36 PCS ± | t-test | p   | SF-36 MCS ± | t-test | p   |
|------------------------------|----|-------------|--------|-----|-------------|--------|-----|
| **Sex**                      |    |             |        |     |             |        |     |
| Male                         | 80 | 40.96±9.65  | 2.968  | 0.003| 42.79±10.69 | 2.979  | 0.003|
| Female                       | 127| 38.04±8.81  |        |     | 39.59±9.49  |        |     |
| **Age (yrs)**                |    |             |        |     |             |        |     |
| 50-69                        | 104| 39.97±8.11  | 3.243  | 0.002| 41.74±9.13  | 3.586  | <0.001|
| ≥70                          | 103| 35.75±8.43  |        |     | 36.12±8.72  |        |     |
| **Topical AG therapy**       |    |             |        |     |             |        |     |
| Regular                      | 141| 39.62±9.20  | 3.142  | 0.002| 41.43±9.90  | 3.658  | <0.001|
| Non-regular                  | 66 | 35.79±8.37  |        |     | 36.61±9.47  |        |     |
| **Progression of disease**   |    |             |        |     |             |        |     |
| Yes                          | 63 | 36.59±9.29  | 3.415  | 0.001| 38.22±10.12 | 3.146  | 0.002|
| No                           | 144| 39.99±8.95  |        |     | 41.64±9.77  |        |     |
| **Education**                |    |             |        |     |             |        |     |
| Lower qualification          | 135| 38.77±9.00  | 1.103  | 0.276| 39.86±12.17 | 0.406  | 0.287|
| Higher qualification         | 72 | 40.74±10.60 |        |     | 40.68±9.73  |        |     |
| **Personal income**          |    |             |        |     |             |        |     |
| <5,000 USD                   | 107| 38.05±8.40  | 1.127  | 0.225| 40.09±9.46  | 1.043  | 0.298|
| ≥5,000 USD                   | 100| 39.91±9.84  |        |     | 41.14±10.50 |        |     |
| **Area**                     |    |             |        |     |             |        |     |
| Urban                        | 130| 38.90±9.25  | 0.263  | 0.293| 39.98±10.15 | 2.908  | 0.004|
| Rural                        | 77 | 39.22±8.87  |        |     | 43.39±8.71  |        |     |
| **Marital status**           |    |             |        |     |             |        |     |
| Married                      | 124| 39.38±9.93  | 1.119  | 0.264| 41.86±9.74  | 2.993  | 0.003|
| Unmarried                    | 83 | 38.37±7.96  |        |     | 38.82±10.08 |        |     |

POAG = primary open-angle glaucoma; SF-36 = 36-Item Short Form Survey; n = number of patients; PCS = Physical Component Summary; MCS = Mental Component Summary; AG = antiglaucoma.
crease the number of drippings per day could certainly contribute to better patient compliance with the advice of ophthalmologists. However, the problem of the high price of new medicines still remains.

Our results showed that patients with glaucoma progression had a significantly lower level of physical and mental health than patients without disease deterioration. In 2005, Lin and Yang conducted a cross-sectional research among 280 glaucoma patients using SF-36 and the National Eye Institute Visual Functioning Questionnaire-25 (NEIVFQ-25). The scores obtained by these questionnaires showed that progression of glaucoma negatively correlated with quality of life. Wilson et al. also report that worsening of glaucoma is a strong predictor of lower SF-36 scores. According to literature data, the association between VF loss and deterioration of VRQL is largely linear. This means that VRQL declines at a constant rate as the VF worsens. In fact, Jones et al. report that the association between VRQL decline and VF worsening is more likely to be described as monotonic. In other words, the relationship could have both slow and rapid stages, or even remain relatively constant for a time. Some studies showed better correlation between VF worsening and VRQL decline obtained by using vision-specific questionnaires such as NEIVFQ-25, Glaucoma Quality of Life-15 (GQL-15) and Visual Function Index (VF-14). This can be explained by the assumption that specific questionnaires for eye diseases correlate more strongly with early VF changes in comparison to instruments that measure GHRQL.

The results of this research showed that glaucoma patients with a higher educational level and economic status achieved higher scores as measured by the EQ-5D index and EQ-5D VAS, as well as by the PSC and MCS scales of the SF-36 instrument. The results of other studies confirm that educational level is an important factor that significantly influences and positively correlates with quality of life. Kharicha et al. report that lower educational status and aging significantly contribute to poorer patient compliance with physicians' advice, and therefore negatively influence quality of life. Most studies have shown positive correlation between socioeconomic status and quality of life in glaucoma patients.

Patients with higher levels of education and higher incomes are in better position to use modern and more expensive antiglaucoma medications, and show a tendency to do so.

Our results showed that patients with POAG who lived in rural areas achieved higher scores in EQ-5D and SF-36. A significant difference was observed only for the MCS scale. Vijaya et al. report a higher prevalence of POAG in urban population compared to rural areas.

### Table 3. Predictive factors for glaucoma progression

| Variable                              | Odds ratio | df  | p     |
|---------------------------------------|------------|-----|-------|
| Mobility                              | 3.670      | 1   | 0.055 |
| Self-care                             | 0.147      | 1   | 0.702 |
| Usual activities                      | 0.389      | 1   | 0.533 |
| Pain/discomfort                       | 0.211      | 1   | 0.646 |
| Anxiety/depression                    | 1.337      | 1   | 0.248 |
| EQ-5D index                           | 3.276      | 1   | 0.070 |
| EQ-5D visual analog scale             | 1.120      | 1   | 0.290 |
| Physical functioning                  | 0.201      | 1   | 0.654 |
| Restrictions due to physical health   | 0.029      | 1   | 0.865 |
| Bodily pain                           | 0.789      | 1   | 0.374 |
| General health                        | 0.065      | 1   | 0.799 |
| Vitality                              | 0.228      | 1   | 0.633 |
| Social functioning                    | 0.953      | 1   | <0.001 |
| Restrictions due to emotional problems| 0.118      | 1   | 0.731 |
| Mental health                         | 0.029      | 1   | 0.864 |
| Physical Component Summary            | 0.352      | 1   | 0.553 |
| Mental Component Summary              | 0.001      | 1   | 0.975 |
| Sex                                   | 3.162      | 1   | 0.075 |
| Age                                   | 3.235      | 1   | 0.072 |
| Education level                       | 0.604      | 1   | 0.437 |
| Personal income                       | 0.044      | 1   | 0.834 |
| Area                                  | 0.889      | 1   | 0.346 |
| Marital status                        | 1.172      | 1   | 0.279 |
| Overall statistics                    | 16.198     | 23  | 0.843 |

EQ-5D = EuroQol-5D
population, which could be caused by the possible influence of lifestyle differences and a higher prevalence of systemic diseases such as hypertension and diabetes in the urban population. This could explain the relatively higher quality of life of people living in rural areas. Contrary to our results, Labiris et al. report higher values for some aspects of VRQL in urban populations. We showed that glaucoma patients who were married scored higher on the EQ-5D and SF-36 instruments in comparison to unmarried patients with POAG. It was shown that older people living alone were more likely to report poor health, poor vision, difficulties with instrumental and basic activities of daily living, worse memory and mood, lower physical activity, risk of social isolation, etc. All these factors may contribute significantly to poorer GHRQL. In 2005, a study conducted in Japan on 600 men and 2,587 women aged >65 showed that health status positively correlated with visual function, physical mobility, lack of depression and social integration. Studies have shown that bilateral VF defects and depressive symptoms were more prevalent in glaucoma patients with impaired VRQL. It was found that visual function and ganglion cell-inner plexiform layer thickness were decreased in depressive patients. Furthermore, Jayawant et al. found the presence of depressive symptoms to negatively affect the regularity of taking antiglaucoma therapy and to increase the cost of glaucoma treatment.

In conclusion, progression of the disease and predisposing sociodemographic factors such as female sex, older age, lower education and economic status, urban area and unmarried status negatively affect quality of life in glaucoma patients.

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References

1. Resnikoff S, Pascollini D, Etya'ale D, et al. Global data on visual impairment in the year 2002. Bull WHO. 2004;82:811-90.
2. Lafuma A, Brezin A, Lopatriello S, et al. Evaluation of non-medical costs associated with visual impairment in four European countries: France, Italy, Germany and United Kingdom. Pharmacoeconomics. 2006;24(2):193-205.
3. Barać J, Biuk D, Matić S, Barać I, Pletić G, Bradvica M. Prevalence of open angle glaucoma in risk groups in Slavonia and Baranya region. Acta Clin Croat. 2017;56:789-94. doi: 10.20471/acc.2017.56.04.29.
4. Quigley HA, Broman AT. The number of people with glaucoma worldwide in 2010 and 2020. Br J Ophthalmol. 2006;90(3):262-7. http://dx.doi.org/10.1136/bjo.2005.081224.
5. Tham YC, Li X, Wong TY, Quigley HA, Aung T, Cheng CY. Global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. Ophthalmology. 2014;121(11):2081-90. https://doi.org/10.1016/j.ophtha.2014.05.013.
6. Iester M, Zingirian M. Quality of life in patients with early, moderate and advanced glaucoma. Eye. 2002;16(1):44-9. https://doi.org/10.1038/sj.eye.6700036.
7. Parrish RK, Gedde SJ, Scott IU, et al. Visual function and quality of life among patients with glaucoma. Arch Ophthalmol. 1997;115(11):1447-55. https://doi.org/10.1001/archophthalmol.1997.01100160617016.
8. Lin JC, Yang MC. Correlation of visual function with health-related quality of life in glaucoma patients. J Eval Clin Pract. 2010;16(1):134-40. https://doi.org/10.1111/j.1365-2753.2009.01135.x.
9. Odberg T, Jakobsen JE, Hultgren SJ, Halseide R. The impact of glaucoma on the quality of life of patients in Norway. II. Patient response correlated to objective data. Acta Ophthalmol Scand. 2001;79(2):121-4. https://doi.org/10.1034/j.1600-0420.2001.079002121.x.
10. Spaeth G, Walt J, Keener J. Evaluation of quality of life for patients with glaucoma. Am J Ophthalmol. 2006;141(1 Suppl):S3-14. https://doi.org/10.1016/j.ajo.2005.07.075.
11. Nordmann JP, Denis P, Vigneux M, Trudeau E, Guillemin I, Berdeaux G. Development of the conceptual framework for the Eye-Drop Satisfaction Questionnaire (EDSQ) in glaucoma using a qualitative study. GBMC Health Serv Res. 2007;7:124. https://doi.org/10.1186/1472-6963-7-124.
12. Runjč T, Novak Laš K, Vatauk Z. Effect of different visual impairment levels on the quality of life in glaucoma patients. Acta Clin Croat. 2018;57:243-50. doi: 10.20471/acc.2018.57.02.03.
13. Nordmann JP, Auzanneau N, Ricard S, Berdeaux G. Vision related quality of life and topical glaucoma treatment side effects. Health Qual Life Outcomes. 2003;1:75. https://doi.org/10.1186/1477-7525-1-75.
14. Tsai JC, McClure CA, Ramos SE, Schlundt DG, Pichert JW. Compliance barriers in glaucoma: a systematic classification. J Glaucoma. 2003;12(5):393-8.
15. Lui MH, Lam JC, Kwong YL, et al. A cross-sectional study on compliance with topical glaucoma medication and its associat-
ed socioeconomic burden for a Chinese population. Int J Ophthalmol. 2017;10(2):293-9. https://doi.org/10.18240/ijo.2017.02.18.

16. Friedman DS, Hahn SR, Gelb L, et al. Doctor-patient communication, health-related beliefs, and adherence in glaucoma results from the Glaucoma Adherence and Persistence Study. Ophthalmology. 2008;115(8):1320-7. https://doi.org/10.1016/j.ophtha.2007.11.023.

17. Hahn SR. Patient-centered communication to assess and enhance patient adherence to glaucoma medication. Ophthalmology. 2009;116(11 Suppl):S37-42. https://doi.org/10.1016/j.ophtha.2009.06.023.

18. Gupta V, Srinivasan G, Mei SS, Gazzard G, Sihota R, Kapoor KS. Utility values among glaucoma patients: an impact on the quality of life. Br J Ophthalmol. 2005;89(10):1241-4. http://dx.doi.org/10.1136/bjo.2005.068858.

19. Esteban JJ, Martinez MS, Navalon PG, et al. Visual impairment and quality of life: gender differences in the elderly in Cuenca, Spain. Qual Life Res. 2008;17(1):37-45. https://doi.org/10.1007/s11136-007-9280-7.

20. Buys YM, Jin YP, the Canadian Glaucoma Risk Factor Study Group. Socioeconomic status as a risk factor for late presentation of glaucoma in Canada. Can J Ophthalmol. 2013;48(2):83-7. https://doi.org/10.1016/j.jcjo.2012.10.003.

21. Jones L, Bryan SR, Crabb DP. Gradually then suddenly? decline in vision-related quality of life as glaucoma worsens. J Ophthalmol. 2017:1-7. https://doi.org/10.1155/2017/1621640.

22. Tastan S, Iyigun E, Bayer A, Acikel C. Anxiety, depression and quality of life in Turkish patients with glaucoma. Psychol Rep. 2010;106(2):343-57. https://doi.org/10.2466/pr0.106.2.343-357.

23. Labiris G, Katsanos A, Fanariotis M, Zacharaki F, Chatzoulis D, Kozobolis VP. Vision-specific quality of life in Greek glaucoma patients. J Glaucoma. 2010;19(1):39-43. https://doi.org/10.1097/IJG.0b013e31819d5cf7.

24. Hodapp E, Parrish RK, Anderson DR. Clinical Decisions in Glaucoma. St Louis: The CV Mosby Co.; 1993.

25. Gupta V, Dutta P, OV M, Kapoor KS, Sihota R, Kumar G. Effect of glaucoma on the quality of life of young patients. Invest Ophthalmol Vis Sci. 2011;52(11):8433-7. https://doi.org/10.1167/iovs.11-6420(98)91135-6.

26. Béchetoille A, Arnould B, Bron A, et al. Measurement of health-related quality of life with glaucoma: validation of the Glau-QoL 36-item questionnaire. Acta Ophthalmol. 2008;86(1):71-80. https://doi.org/10.1111/j.1600-4040.2007.00999.x.

27. Silva LR, de Paula JS, Rocha EM, Rodrigues ML. Factors related to glaucoma treatment compliance: patients’ opinions from a University Hospital. Arq Bras Oftalmol. 2010;73(2):116-9.

28. Renard JP, May F, Rigal-Sastourne JC, Maurin JF. New medical treatments of glaucoma. New strategies? J Fr Ophthalmol. 2001;24(10):1095-9.

29. Wilson MR, Coleman AL, Yu F, et al. Functional status and well-being in patients with glaucoma as measured by the Medical Outcomes Study Short Form-36 questionnaire. Ophthalmology. 1998;105(11):2112-6. https://doi.org/10.1016/S0161-6420(98)91135-6.

30. Alqudah A, Mansberger SL, Gardiner SK, Demirel S. Vision-related quality of life in glaucoma suspect or early glaucoma patients. J Glaucoma. 2016;25(8):629-33. https://doi.org/10.1097/IJG.0000000000000445.

31. Abe RY, Diniz-Filho A, Costa VP, Gracitelli CP, Baig S, Medeiros FA. The impact of location of progressive visual field loss on longitudinal changes in quality of life of patients with glaucoma. Ophthalmology. 2016;123(3):552-7. https://doi.org/10.1016/j.jcjo.2015.10.046.

32. Sherwood MB, Garcia-Siekavizza A, Meltzer MI, Hebert A, Burns AF, McGorray S. Glaucoma’s impact on quality of life and its relation to clinical indicators: a pilot study. Ophthalmology. 1998;105(3):561-6. https://doi.org/10.1016/S0161-6420(98)93043-3.

33. Gutierrez P, Wilson MR, Johnson C, et al. Influence of glaucomatous visual field loss on health-related quality of life. Arch Ophthalmol. 1997;115(6):777-84. https://doi.org/10.1001/archophthalm.1997.01100150799014.

34. Jampel HD, Schwartz GF, Robin AL, Abrams DA, Johnson E, Miller RB. Patient preferences for eye drop characteristics: a willingness-to-pay analysis. Arch Ophthalmol. 2003;121(4):540-6. https://doi.org/10.1001/archopht.121.4.540.

35. Onakoya AO, Mbadugha CA, Aribaba OT, Ibidapo OO. Quality of life of primary open angle glaucoma patients in Lagos, Nigeria: clinical and sociodemographic correlates. J Glaucoma. 2012;21(5):287-95. https://doi.org/10.1097/IJG.0b013e31820d7cf7.

36. Kharicha K, Iliffe S, Harari D, et al. Health risk appraisal in older people 1: are older people living alone an “at-risk” group? Br J Gen Pract. 2007;57(541):271-6.

37. Salowe R, Salinas J, Farbman NH, et al. Primary open-angle glaucoma in individuals of African descent: a review of risk factors. J Clin Exp Ophthalmol. 2015;6(4):450. https://doi.org/10.4172/2155-9570.1000450.

38. Vijaya L, George L, Arvind H, et al. Prevalence of primary open-angle glaucoma in an urban south Indian population and comparison with a rural population. The Chennai Glaucoma Study Ophthalmology. Ophthalmology. 2008 Apr;115(4):648-654.e1. doi: 10.1016/j.ophtha.2007.04.062.

39. Sun W, Watanabe M, Tanimoto Y, et al. Factors associated with good self-rated health of non-disabled elderly living alone in Japan: a cross-sectional study. BMC Public Health. 2007;7:297. https://doi.org/10.1186/1471-2458-7-297.

40. Musch DC, Nizioł LM, Janz NK, Gillespie BW. Trends in and predictors of depression among participants in the Collaborative Initial Glaucoma Treatment Study (CIGTS). Am J Ophthalmol. 2019;197:128-35. doi: 10.1016/j.ajo.2018.09.015.

41. Rulli E, Quanrant L, Riva I, et al. Visual field loss and vision-related quality of life in the Italian Primary Open Angle Glau-
KVALITETA ŽIVOTA POVEZANA SA ZDRAVLJEM
U BOLESNIKA S PRIMARNIM GLAUKOMOM OTVORENOG KUTA

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Svrha ovoga istraživanja bila je utvrditi odnos između kvalitete života povezane s općim zdravljem (GHRQL) i sociodemografskih čimbenika u bolesnika s primarnim glaukomom otvorenog kuta (POAG). Riječ je o presječnoj studiji u kojoj je sudjelovalo 207 bolesnika s POAG. GHRQL mjerena je pomoću dva upitnika: kratkog upitnika zdravstvenog statusa s 36 pitanja (SF-36) i upitnika EuroQol-5D (EQ-5D). Muškarci i bolesnici s glaukomom u dobi od 50-69 godina, zatim bolesnici koji su redovito koristili antiglaukomsku terapiju i oni bez progresije glaukoma izvijestili su o znatno višoj kvaliteti života mjerenoj indeksom EQ-5D i vizualnom analognom ljestvicom EQ-5D (VAS) (p<0,05 za sve usporedbe). Slično tome, Sažetak fizičkih komponenata (PCS) i Sažetak mentalnih komponenata (MCS) upitnika SF-36 imali su značajno veće vrijednosti za ove bolesnike (p<0,05 za sve usporedbe). Nadalje, ispitanici s visokim stupnjem obrazovanja i ekonomskim statusom, ispitanici koji žive u ruralnim područjima i oni koji su u braku postigli su veće rezultate na EQ-5D i SF-36. Zaključno, napredovanje bolesti, ženski spol, starija životna dob, niži stupanj obrazovanja i ekonomski status, urbano područje življenja i samoća negativno utječu na kvalitetu života bolesnika s glaukomom.

Ključne riječi: Glaukom; Kvaliteta života povezana sa zdravljem; Sociodemografski čimbenici