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Quality of Life among Patients with Glaucoma in Gaza Governorates

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Abstract:

Background: Glaucoma is the second leading cause of blindness worldwide. Quality of Life (QOL) has emerged as an important parameter for assessing the quality of health care of patients with Glaucoma disease. This study assessed QOL among Glaucoma patients in Gaza Governorates and the factors influencing their life conditions.

Methods: This is a descriptive, analytical, cross-sectional study included 265 eligible glaucoma patients from Al Nasser Ophthalmic Hospital and European Gaza Hospital. Socio-demographic and disease-related characteristics in addition to QOL data were collected using the Glaucoma Quality of Life-15 (GQL-15) and Short-Form 36 Health Survey (SF-36) questionnaires.

Results: Study participants had a medium level of QOL scores. The mean score for GQL-15 was 59.2 ± 17.6. The greatest difficulty was in activities involving glare and dark adaptation (48.5±18.0), while least difficulty for outdoor mobility (66.6±25.4). The overall mean percentage of SF-36 domain scores was 61.7±13.5. The bodily pain domain got the highest score (79.4); the social function domain was (72.22); and the lowest domain was General Health (48.58). Findings also showed that participants without ocular diseases and comorbidities had better QOL. Moreover, patients with higher educational level, higher income and disease duration less than 5 years had better QOL scores.

Conclusion: Glaucoma has moderately negative effects on people's ability to function independently in every field of their lives. Glaucoma patients should be educated to understand the prognosis of the disease and importance of the adherence to the daily treatment to improve their QOL.

Keywords:
Glaucoma - quality of life - assessment - Gaza Governorates

1. Introduction

Glaucoma is considered one of the major health problems worldwide with increasing incidence and social impact. It's the second leading cause of blindness globally (Rossetti et al., 2015). In 2013, it was estimated that there are 64.3 million people in the world with Primary Open-Angle Glaucoma (POAG) and Primary Angle-Closure Glaucoma (PACG). By the year 2020 this number is predicted to increase to 76.0 million and the number of people with glaucoma worldwide will rise to 111.8 million in 2040 (Tham, 2014). Glaucoma is a progressive, chronic optic neuropathy that may result in a functional loss of vision. It is typically characterized by increased intraocular pressure, retinal nerve fiber and optic nerve damage, and progressive loss of visual fields. It is usually referred to as the silent thief of sight (Anderson, 2006; Cassin & Rubin, 2006). The most significant risk factors of Glaucoma are aging, family history, elevated intraocular pressure and optic nerve damage (McMonnies, 2017).

Epidemiologic studies demonstrate that disease prevalence increases significantly with age. Glaucoma can impact patient's Quality Of Life (QOL) in several ways: worsening visual function, the mental burden produced by diagnosis, fear of blindness (Janz et al., 2007), anxiety and depression (Mabuchi et al., 2008), the possible side effects of treatment (medical and/or surgical), and the financial burden (cost of clinic visits and medical therapies) (Bramley et al., 2008). Patients with reduced QOL place a greater financial burden on healthcare services and society than those with better QOL. So, maintaining a patient's QOL has always been an important goal for glaucoma treatments (Lazcano-Gomez et al., 2016).

The interest of clinicians and researchers concerning QOL assessment in chronic diseases increases constantly. QOL is an important indicator of health and well-being; it determines the effectiveness of treatment, choice of the main concern for resources distribution, and help in policy developments (Karen et al., 2008).

Assessment of QOL is being increasingly established as a critical measurement in monitoring and evaluating the effectiveness of different treatments of glaucoma (Janz et al., 2001; Nelson, 2003). The aim of this study is to assess and evaluate QOL among glaucoma patients in Gaza Governorates, and to determine the most prominent socio-demographic and disease-related factors that influence their QOL.

2. Methodology

Sample

This study is a descriptive, analytical cross-sectional one to assess QOL among glaucoma patients. Data were collected over a period of ten months from May 2016 to February 2017 from 265 people with Glaucoma recruited as a convenient sample from ophthalmic clinics at Al-Nasser Ophthalmic Hospital and European Gaza hospital. The researcher used the statistical formula of the Decision Analyst STATS 2 program to calculate the sample size at maximum acceptable percentage points of error 5%. The sample size at desired confidence level 95% equal 299 glaucoma patients out of the total number of target population 1350. The response rate was 88.6%, so the actual number of participants who filled the questionnaires was 265. The inclusion criteria required that subjects were older than 18 years, diagnosed with Glaucoma and free from any cognitive or hearing disability. Informed consent was obtained from all subjects to ensure voluntary participation in the study.

Data collection

To ensure an accurate data collection process, the researchers and 2 trained assistants conducted face to-face interviews to guide the eligible participants to fill the two study questionnaires. QOL was assessed using the Short Form-36 health survey (SF-36) and

Glaucoma Quality of Life-15 (GQL-15). The SF-36 and GQL-15 questionnaires are available in different languages including validated Arabic version. They were validated and have demonstrated good content validity, discriminate validity, test-retest reliability, and internal consistency. However, we conducted a pilot test on 30 patients to explore whether respondents understand the questions, to minimize the problems which may rise during data collection, and to determine the exact time needed to fill the two questionnaires.

QOL assessment questionnaires

The Short Form-36 survey is a well-recognized, self-administered QOL scoring system. It consists of 36 items measuring eight multi-item subscales and aspects of physical and mental health (MH) status including: physical functioning (PF), role limitations due to existing physical problems (RP), bodily pain (BP), general health(GH), social functioning (SF), role limitations due to emotional problems (RE), vitality (VT) and mental health (MH)(Lins & Carvalho, 2016). The SF-36 items describe the eight health concepts were transformed into a score of 0-100 and the items scale averaged to obtain a subscale score. Physical component summary and mental component summary were computed by averaging the values of the respective subscales. A higher score indicated higher levels of function and better health. Glaucoma GQL-15 Questionnaire is one of the better glaucoma-specific instruments, with good acceptability among clinicians and patients. The domains comprise of near vision, peripheral vision, outdoor mobility and glare and dark adaptation. It has been shown to be reliable and has good internal consistency (Goldberg et al., 2009). Higher GQL-15 scores indicate poorer QOL. The GQL-15 item level responses were coded on a scale of 0 to 5. Number (5) represented severe difficulty due to visual reasons, while number (1) indicated no difficulty with performing the activity, and (0) signified abstinence from activity for non-visual reasons. Summation of the item response scores of the GQL-15 provided the summary scores. To calculate the subscale scores for the four domains of the GQL-15, the item level responses were scored on a numerical interval scale ranging from (0) indicating no difficulty, to (100) indicating severe difficulty. Higher subscale scores were indicative of increasing difficulty with vision-related activities and poorer QOL. A measure of the degree of difficulty in performing visual tasks outlined in the GQL-15 was depicted by corresponding visual performance (Nelson *et al.*, 2003). But the researcher reverses the results for GQL-15 and became the results as follows: scale ranging from (100) indicating no difficulty, to (0) indicating severe difficulty. Lower subscale scores were indicative of increasing difficulty with vision-related activities and poorer QOL. Researcher explains the inverse results, to be a consensus among the two questionnaires, and also that, the highest value is the best in QOL.

Additional questions recorded information on the socio demographic variables of subjects: sex, age, marital status, education, income and disease related variables including duration of disease, presence of other eye disease, presence of systemic disease and compliance with treatment.

Statistical analysis

Statistical analysis was performed using *SPSS*, version 20.0. Descriptive statistics—percentages, means, ranges and standard deviations (SD) scores—were calculated for all study variables. Statistical significance was set at $P < 0.05$. Inferential statistics, t-test and ANOVA, were used to find the relationship between QOL dimensions and other independent variables—socio demographic (gender, age, marital status, income, education) and disease related variables (duration and presence of other eye disease, presence of systemic disease and compliance with treatment).

Ethical and administrative considerations

This study was approved by the Helsinki ethical committee - Gaza strip. An official letter of approval from Ministry of Health to collect data from hospitals was obtained. The nature of the study was explained to potential participants. Individuals were enrolled into the study if they gave informed verbal consent.

3. Results

Description of the sample

A total of 265 subjects with Glaucoma participated in the study (180 from Al Nasser Ophthalmic Hospital, 85 from European Gaza Hospital). The sociodemographic and disease-related characteristics of the 265 subjects are presented in Table 1. More males participated in the study (55.5%), a majority of the subjects were married (88.7%) and most (70.9%) had level of income less than 1000 NIS (about 300 US$).

Table 1 Sociodemographic characteristics of the study participants (n = 265)

Variable	No.	%
Sex		
Male	147	55.5
Female	118	44.5
Age		
18 to 30 Years old	23	8.7
From 31 to 40 Years	27	10.2
More than 40 Years old	215	81.1
Education		
Illiteracy	29	10.9
Primary &Secondary	91	34.3
Tertiary	99	37.4
University	46	17.4
Marital Status		
Not Married	30	11.3
Married	235	88.7
Monthly Income NIS		
Less than 1000	188	70.9
From 1000 to 2000	54	20.4
More than 2000	23	8.7

As shown in Table (2), 46% of participants reported having glaucoma less than 5 years and more than half (54.7%) had a history of chronic diseases.

Table 2: ***Disease-specific characteristics of the study participants (n = 265)***

Variable	No.	%
History of Ocular disease		
Yes	103	38.9
No	162	61.1
History of chronic disease		
Yes	145	54.7
No	120	45.3

Duration of disease		
Less than 5 Years	122	46.0
From 5 to 10 Years	71	26.8
More than 10 Years	72	27.2
Compliance with treatment		
Yes	230	86.8
No	35	13.2

Factors influencing quality of life

The higher the QOL score, the fewer difficulties and better life conditions experienced by Glaucoma patients. Generally, Glaucoma patients had medium level of QOL scores in both SF-36 and GQL-15 scales (61.7 and 59.2 respectively) (Table 3).

GQL-15 questionnaire indicates that patients showed the greatest difficulty in activities involving glare and dark adaptation (48.5 ± 18.0), followed by central and near vision (57.3 ± 19.1), peripheral vision (61.4 ± 19.4), and the least difficulty for outdoor mobility (66.6± 25.4).

Analysis of the SF-36 questionnaire revealed that the overall mean of all SF-36 domains was 61.7 ± 13.5. Domain mean scores ranged from (48.58) to (79.4). The bodily pain domain got the highest score (79.4), the social function domain was (72.22), the emotional role limitation was (58.24), the mental health domain was (54.7), the vitality domain (54.09). The lowest mean score was general health domain (48.58).

Table 3: ***SF-36 and GQL-15 domains of quality of life***

Variables	Mean	SD
Short-Form 36 Health Survey (SF-36)		
Physical Function	70.38	23.9
Role limitation due to physical Health	55.75	27.3
Role limitation due to emotional problems	58.24	32.1
Energy / Fatigue	54.09	10.0
Emotional well being	54.7	13.1
Social Functioning	72.22	28.7
Pain	79.42	33.3
General Health	48.58	8.7
Total SF– 36 domains	**61.7**	**13.5**
Glaucoma quality of life -15 (GQOL-15)		
Central vision	57.3	19.1
Peripheral vision	61.4	19.4
Outdoor mobility	66.6	25.4
Glare and dark adaptation	48.5	18.0
Total GQL-15 domains	**59.2**	**17.6**

When relating the socio demographic variables with QOL, t-test and ANOVA revealed that females had poorer QOL in SF-36 than male (64.5 vs. 58. 2). QOL was better at age group (18-30) with mean (66.3) compared with the other age groups. Moreover, participants with an

income of more than 1000 NIS had better QOL compared with participants with an income of less than 1000 NIS. In addition, findings showed that, there were statistically significant differences between different educational levels regarding QOL. These differences were in favor of university level patients in comparison with patients of secondary or less levels. (Table 4).

Table 4: ***Association of socio-demographic variables with QOL in Glaucoma patients***

Socio-demographic Variables	No. of Patients	SF-36 Mean ± SD	GQL-15 Mean ± SD
Gender			
Male	147	64.5± 12.7	58.4± 17.9
Female	118	58.2± 13.8	60.4± 17.3
Age Groups			
18 to 30 Years	23	66.3 ± 10.6	58.9± 15.1
From 31 to 40	27	61.4± 12.0	59.3± 13.8
More than 40	215	61.2± 13.9	58.3± 18.5
Income NIS			
Less than 1000	188	59.4± 13.4	55.7± 15.2
From 1000 to 2000	54	63.1± 11.4	59.0± 13.5
More than 2000	23	77.0± 7.4	85.3± 18.5
Education level			
Illiteracy	29	49.9± 15.6	45.3± 9.8
Primary	91	60.7± 10.8	57.7± 16.2
Tertiary	99	63.6± 14.0	60.1± 18.5
University	46	66.8± 11.7	62.9± 18.8

Glaucoma-related characteristics were also analyzed with QOL. Patients with disease duration less than 5 years had better degree of QOL scores in the scales. History of ocular and systematic disease was found to be associated with lower QOL. Likewise, complied patients with treatment have slightly better scores of the all QOL domains (Table 5).

Table 5: ***Association of disease- specific variables with QOL in Glaucoma patients***

Disease-specific Variables	No. of Patients	SF-36 Mean ± SD	GQL-15 Mean ± SD
History of Ocular disease			
Yes	23	58.5 ± 12.9	55.0 ± 17.0
No	27	63.7 ± 13.5	62.0 ± 17.9
Duration of disease			

Less than 5 years	122	62.6 ± 12.7	66.8 ± 16.0
From 5 to 10	71	59.4 ± 13.9	56.8 ± 19.7
More than 10	72	62.4 ± 14.4	48.1 ± 10.2
History of chronic diseases			
Yes	145	58.8 ± 14.6	57.6 ± 17.0
No	120	65.2 ± 11.2	61.1 ± 18.2

4. Discussion

In this study, we found that the overall QOL score was at medium level for glaucoma patients. This is consistent with many studies which reported medium level of QOL among patients suffering from glaucoma. Lin et al. (2010) and Evans et al. (2009) found that glaucoma patients had medium scores per SF-36. Similarly, Goldberg et al. (2009) and Naveen et al. (2014) administered GQL-15 questionnaire to assess QOL in glaucoma patients and found similar observations. Many factors may be attributed to this level of QOL among glaucoma patients which includes visual impairment, inconvenience, side effects and the cost of treatment.

Among socio-demographic variables, the aging had significantly decreased QOL. Aging process is mainly related to the physical dimensions of QOL. It reflects the worsening in physical activities by age. Moreover, the negative effect of disease process on daily life activities such as difficulty in tripping over object, difficulty in walking in steps/stairs, driving restriction, falls, fear of falling, decreased physical activity and greater self-reported mobility difficulty are more obvious in older patients (Nguyen et al., 2015; Labiris et al., 2010; Aspinall et al., 2008). This decreasing QOL with increasing age was also observed by Sun et al. (2009) in their Chinese patients with angle closure glaucoma. Another study demonstrated that age had a negative impact on QOL and affected all the subscales of the GQL-15 (Jain et al., 2015). Besides, low income was associated with decreased scores of QOL in all domains. Patients with low income are unable to buy all the medicines they need, can't make the necessary surgical procedures that maintain the stability of their health, cannot pay for the doctor in their private clinics and have worse availability to different services (Zuo et al. 2015).

Glaucoma patients with higher education level had better mean scores in all QOL domains. This may be due to their better ability to understanding the chronic nature of the disease and its complications, and how to cope with it**.** Moreover, the educated patients may have better employment chances and higher economic status.

The mean GQL-15 score was significantly lower in domains of central vision and dark adaptation. This observation is consistent with studies which have found that visual disability is associated with dark adaptation or glare, like walking after dark, seeing at night and adjusting to different levels of illumination (Nelson et al., 2003; Mbadugha et al., 2012; Naveen et al., 2014).

The results of this study indicated that Glaucoma negatively affects psychological functioning (54.71). Such result is consistent with a study which indicated that early stage glaucoma with mild visual filed loss adversely affects anxiety, self-image, and confidence in health care. As Visual acuity worsens in advanced glaucoma, anxiety further increases and self-image deteriorates (Chan et al., 2015).

In our study, most of the disease variables including longer duration, presence of other eye diseases and presence of systemic disease were found to have lower scores of QOL. Such variables restrict patient's ability to perform activities of daily living, increase pain or discomfort and reduce their satisfaction with their lifestyle thus impairing their QOL.

Conclusion

The findings of this study demonstrated that patients with Glaucoma had a medium level of QOL scores. This study identified common problems encountered by patients which now are not assessed in routine glaucoma care. It also identified a subgroup of questions that seems to be specific for glaucoma. Also, a study has proved that Glaucoma has wide effects on people's ability to function independently in every field of their lives. It affects the physical, mental and social well-being of people. Glaucoma patients should be educated to understand the prognosis of the disease and importance of the adherence to daily treatment. Assessment of QOL in glaucoma patients may be useful in determining the management strategies modified per the patient's need for daily living which seems to be of vital importance in these patients and are significantly correlated with their higher QOL.

Recommendations

- Routine constant QOL assessment is helpful to recognize individual needs.
- There should be a clear protocol on how to use the information obtained from QOL assessments.
- Inclusion of contrast sensitivity, glare and dark adaptation assessment in routine clinical management of glaucoma patients.
- Designing and implementing educational programs for optometrists to help them provide optometry interventions, counseling sessions and psychological support for Glaucoma patients

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