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# Quality of Life among Patients with Glaucoma in Gaza Governorates

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# Quality of Life among Patients with Glaucoma in Gaza Governorates

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## Dedication

*To the spirit of my dear father*

*To my world to my mother to whom I owe my life and success*

*To my wife who has been a great source of motivation and inspiration.*

*To my brothers; Yahya, Zakaria and sisters S, Z, A*

*To my uncles; Atef, Ahed , Adnan, Moean, Motaz for supporting me*

*To my sister's husband.; Mohammed*

*To my little princes;* ***Lolo*** *for here encouraging smiles*

*To my friends*

*To my colleagues*

*And*

*To everyone who contributed to make this study a reality, thank you*

**Mohammed Zakaria Ali Mushtaha**

## Declaration

I certify that this thesis submitted for the degree of master is the result of my own research, except where otherwise acknowledged, and that this thesis or any of its parts has not been submitted for higher degree to any other university or institution.

Signed:

Mohammed Zakaria Ali Mushtaha

Date: / / 2017

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# Abstract

**Background**: Glaucoma is the second leading cause of blindness worldwide. Glaucoma is a group of eye diseases that permanently damage visual functions and can impact patient quality of life negativity. Quality of Life has emerged as an important parameter for assessing the quality of health care of patients with Glaucoma disease. So, the present study was carried out in Al Nasser Ophthalmic Hospital and European Gaza Hospital, with the aim to assess and evaluate QOL among Glaucoma patients in Gaza Governorates and the factors influencing their life conditions.

**Methods:** This descriptive, analytical, cross-sectional study included 265 glaucoma patients whose age was 18 years or more. Data collected at Al Nasser Ophthalmic Hospital and European Gaza Hospital included socioeconomics, demographics and disease characteristics. QOL data collected using the Glaucoma Quality of Life-15 questionnaire (GQL-15) and Medical Outcomes Study Short-Form 36 Health Survey (SF-36) questionnaire.

**Results**: The results showed that study participants had a medium perception level of QOL. The mean summary score for GQL-15 was 59.2 ± 17.6. 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). Moreover, the overall mean percentage of SF-36 domain scores 61.7±13.5. The bodily pain domain got the highest score (79.4). Moreover, the social function domain was (72.22), the physical function domain (70.32), the emotional role limitation (58.24), the role limitation due to physical health (55.75), the mental health domain (54.7), the vitality domain (54.09), and the lowest domain was General health with equaled (48.58).

Finding showed that females had poorer QOL in SF-36 than male (64.5 vs. 58. 2). QOL was better at age group (18-30) (66.3), compared with the other participants. Moreover, participants with an income of more than 1000 NIS had better QOL. For disease-related variables, finding showed that participants without (ocular disease and comorbid) had better QOL compared with those who had an ocular disease and comorbid.
In addition, finding presented that, patients with disease duration less than 5 years had a better degree of QOL domains. In addition, findings showed that glaucoma patient's when attended more educational represented higher QOL.

**Conclusion:** The findings demonstrated that patients with Glaucoma disease had a medium level perception about their QOL. 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.

**Recommendations:** Results highlight some important recommendations such as: increasing efforts to prevent negative impacts of disease on QOL of patients by improving a quality of eye care and establishing vision rehabilitation program. Planning and implementing educational programs for the optometrist to help Glaucoma Patients to cope better with their chronic disease are very crucial Moreover, development of medical patient file at diagnostic units and enhancement of proper documentation and stability in the availability of fundamental medications are important steps to improve QOL. There is a need to conduct more research studies, including both qualitative and quantitative studies to understand individual areas of need which can be addressed in the future.

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## List of Abbreviations

| | |
|---|---|
| ADLS | Activity of Daily life |
| AH | Aqueous Humor |
| EGH | European Gaza hospital |
| GG | Gaza Governorates |
| HCS | Health Care System |
| HRQOL | Health Related Quality of Life |
| IOP | Intraocular Pressure |
| MOH | Ministry Of Health |
| NOH | Al Nasser Ophthalmic Hospital |
| PCAG | Primary Closed Angle Glaucoma |
| PCBS | Palestinian Central Bureau of Statistics |
| PHCS | Palestinian Health Care System |
| PNGO | Palestinian Nongovernmental Organizations |
| POAG | Primary Open Angle Glaucoma |
| QOL | Quality of Life |
| UNRWA | United Nations Relief and Works Agency |
| WHO | World Health Organization |
| VF | Visual Filed |
| VRQOL | Vision related quality of life |
| OSD | Ocular surface disease |
| NICE | National Institute for Health and Care Excellence |

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# Chapter One Introduction

## 1.1 **Background**

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. 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).

Epidemiological studies demonstrate that disease prevalence increasing significantly with age. Glaucoma can affect 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 systems and society than those with better QOL. So, maintaining a patient's QOL has always been an important goal for glaucoma treatments.

The interest of clinicians and researchers concerning the quality of life assessment in chronic disease's increases constantly. A Quality of life is an important indicator of health and well-being. It determines the effectiveness of treatment, chooses the main concern for resource's distribution, and help in policy improvements (Karen, et al. 2008). Assessment of quality of life is being increasingly established as a critical measurement in monitoring and evaluating the effectiveness of different treatments for glaucoma (Janz et al., 2001; Nelson, 2003).

Glaucoma is one of the major causes of blindness in Palestine, and for those not blind, may affect QOL in many ways. Here in Gaza strip, there is no reliable published data about the prevalence of glaucoma and glaucoma subtypes.

Furthermore, assessment of the quality of life in glaucoma patients has not been previously studied in Gaza strip. The finding and recommendation of this study will be presented to the decision makers, to promote alterations and guidelines regarding patients' daily living and safety and contribution to improving the quality of life in the glaucoma patients.

## 1.2 Research problem

Loss of vision has a statistically significant association with disability, has broad effects on people's ability to function independently in every scope of their lives, as indicated by loss of personal independence, impaired mobility and falls, depression, transportation challenges, difficulties maintaining employment, and placement in long-term care. As people's vision worsens, their psychological burden increases along with a fear of blindness and social withdrawal (Campbell & Crews, 2001; Ramulu et al., 2012; Skalicky & Goldberg, 2008).

Glaucoma is the second most common cause of loss of vision worldwide; it is potentially life-threatening and life-limiting condition that causes of distribution in education and social activities. Therefore, it is important to focus upon the problem presented by patients with Glaucoma, assessing their QOL and related problems, which could be directly affecting on their various life domains.

In the meantime, it's important for evaluation the knowledge and outcome of the patient receiving Health Care. This is particularly the case for a patient with a long-term chronic disease, since complete cure for their illness is often impossible (Macduff, 2000).

There is unclear data for patient needs and Lack of the qualitative and quantitative studies. For this reason, the current study takes a place to assess the quality of life for the glaucoma patient in GGS in order to contribute in the Improvement of their quality of life. The researcher will study the quality of life for the glaucoma patient for the first time in Palestine.

## 1.3 Justification

Health care professionals thus should give special attention to not only the influence of the disease or handicap on the everyday functioning of their patients (that equal health status), but also to their patients' satisfaction with their physical, psychological, and social functioning (that equal QOL) (De Vries, 2001; De Vries and Drent, 2006).

Glaucoma causes a high burden of disease and disability. In particular, glaucoma impacts on an individual's visual, social, physical and psychological functioning, and increases the risk of a number of adverse health outcomes.

QOL needs to be considered when evaluating the knowledge and outcome of patients receiving health care because it's an important parameter. This is particularly the case for patients with long term chronic diseases (Macduff, 2000).

Quality of life assessment is very important indicator of outcome of medical service and provides understanding of nature of disease and experiences of patients, and work as guide of efficiency of treatment. In view to the fact that there is no study conducted the quality of life among the glaucoma patient's in our society. A great attention should be directed toward those who are suffering from this threatening and disabling disease because those people are in desperate need of healthcare, Rehabilitation follow- up, health education, advising and ongoing medical treatment, these efforts based on a realistic study and careful assessment of their needs and what fit their abilities to reduce the worry and to prepare them to live safe and healthy lifestyles.

The study will spotlight on QOL among Glaucoma patients in GG in order to evaluate QOL domains. In addition, the assessing of QOL among Glaucoma patients may contribute to the investigation of the effectiveness and responsiveness of the HCS.

### 1.4 Aim of the study

The aim of this study is to assess and evaluate Quality of Life among glaucoma patients in Gaza Governorates, in order to improving their QOL and to provide knowledge about the impact of glaucoma on the QOL of those patients.

### 1.5 Study objectives

1- To assess the QOL levels among glaucoma patient in GG.
2- To identify Glaucoma patients' perceptions about their General health
3- To assess the impact of glaucoma on QOL domains of glaucoma patient.
4- To determine the relationship between socio demographic factors and QOL.
5- To explore the relationship between the health profile and QOL of Glaucoma patients
6- To provide recommendations to improve QOL and enhance activity of daily Life (ADLS) among those patients.

### 1.5 Research Questions

1- Dose the glaucoma patient in Gaza governorates enjoying QOL?
2- Are Glaucoma patients are satisfied with their health?

2- How do the glaucoma patients view their QOL?

3- What is the impact of glaucoma on QOL?

4-What are the socio demographic characteristic associated with QOL among glaucoma patient?

5- What is the relationship between health profile and QOL in Glaucoma patients?

6-What are the recommendation could be drown from the study in order to enhance QOL among glaucoma patient in GGs?

### 1.6 Context of the study

This study is about a quality of life among glaucoma patients at hospitals in the Gaza strip, so it will be affected by the geographical area and the socio economic, educational situation. However, it is important to show some details about this context as follows:

#### 1.6.1 Gaza Governorate demographic characteristics

The Gaza Strip (GS) is a small part of land located in the southern area of Palestine (**Annex**1). According to the Palestinian Central Bureau of Statistics (PCBS)the total number of population was 1,850,559 with high population density; more than 5,070 individuals per square kilometer (PCBS, 2016). This high population density resulted in high demands for health care services and possible work overload for health care providers in this crowded area.

The Gaza strip is divided into five governorates: North Gaza, Gaza City, Mid Zone, Khanunis and Rafah (Palestinian Water Authority, 2013) characterized by less wide spaces and less remote areas compared with the West Bank; resulting in better geographical accessibility for the healthcare services.

#### 1.6.2 Socio-economic situation

In the last years, economic situation continued to severely drop in the case of implementation of stricter closures on Gaza after the Palestinian legislative election in 2006 and the Palestinian conflict which lead to gap between the two sides of the Palestinian territories, the Gaza Strip and the West Bank.

The poverty rate in 2008 was expected to be higher than it was in 2006 (Giacaman et. al., 2009). This worsening in economic situation had its' negative impacts on financial access to health care facilities. Furthermore, the terrible attack of Israeli military in December 2008 and November 2012 and July 2014 in Gaza Strip increase the burden of poverty due

to the massive destruction of the public infrastructure and utilities, including water, sanitation, electricity, transportation networks, educational institutions and homes.

Furthermore, the closure of most factories that lacked its' raw material and preventing the export of the farmer's crops. Overall, this bad economy affected the amount of governmental revenues, which use as a source for the health care system, lead to depend on the donation in providing the needed health care services.

### 1.6.3 Health context

Matched to the region, the Palestinian population's overall health status outcomes are relatively good (MOH, 2014a). Healthcare services are effective especially when Comparing health outcomes in the GGs to those in the region, where progress in many health outcomes is remarkably noticed (World Bank, 2011b). According to the MOH, life expectancy at birth in West Bank and Gaza reached 73 years, compared to 71 years as the average of Middle East and North Africa and 81.1 years in the OEDC countries (MOH. 2014a; World Bank, 2012; OEDC, 2013). It is accepted that the GGs view a status of "epidemiological transition" where mortalities are shifting from communicable diseases to no-communicable ones (MOH, 2014a). Data show that the leading causes of death are chronic conditions, namely heart diseases, cancer, perinatal conditions, and cerebro-vascular conditions, while infectious diseases contributed at 4.7% of the leading causes of death (MOH, 2012). Nevertheless, poverty-related diseases and illnesses, such as malnutrition, anemia and other psychological illnesses also exist. Regarding mental health, chronic violence, economic deprivation, social and cultural disparities had created psychological pressure on Palestinians. People often mention feeling hopeless and frustrated (World Bank, 2010). The ongoing psychological pain has resulted in a Jack of hope that has been translated into mental discomfort, domestic violence and a high rate of divorce, in addition to increased levels of anxiety, emotional numbness and psychosomatic reactions (MOH, 2014a).

#### 1.6.3.1 Disability in Palestine

In 2011 data showed that around 113 thousand individuals suffered from at least one disability which constitutes 2.7% of the total population of Palestine: 75 thousand in the West Bank 2.9%, and around 38 thousand in Gaza Strip 2.4%. By gender, 2.9% are males and 2.5% are females (PCBS, 2011).

- **Seeing disability/difficulty according PCBS**

Individuals who have some difficulties in vision that limits their ability to perform their daily duties, for example, may not be able to read, or see road signs while driving a car, may not be able to see well with one eye, or tunnel vision, or problem with vision that they perceive to be a problem. All individuals are asked whether they wear glasses or not, and must be reminded to wear glasses or contact lenses (PCBS, 2011).

**Seeing disability** is the third highest prevalence disability comprising 21.6% of disabled individuals in the Palestine Territory: 21.9 % in the West Bank compared to 21.3 % in Gaza Strip (PCBS, 2011).

### 1.6.4 Health care system

The initial mentioned demographic characters of the Gaza Governorates population mean that there is an increasing load on the health sector which should respond not only to the current challenges of occupation, siege and political divisions but also to the increasing demands for health services resulted from the ongoing increase in population size (PNGO, 2009).

Although availability of four health provider's Ministry of Health (MOH), United Nations Relief and Works Agency (UNRWA), Non-Governmental Organizations (NGO) and the private for-profit service providers all share in the provision of health services at different levels (MOH, 2014). MOH is the principal health care provider and serves as a regulatory body for the healthcare system in the governorates; it provides primary, secondary and tertiary services for the whole population, also it purchases advanced medical services from the neighboring countries and other private and NGO health care facilities by referring patients.

### 1.6.5 Hospitals in Gaza Strip

According to Health annual report data of 2011, the number of operating hospitals in the Palestinian Territory were 81, 51 hospitals in the West Bank, and 30 in Gaza Strip. The number of hospital beds in the Palestinian Territory were 5 414, representing 1.3 beds for every 1000 person, 3 163 in the West Bank and 2 251 in the Gaza Strip. Data from report 2011 also showed that 25 hospitals were governmental and 56 were nongovernmental hospitals. On the other hand, 2011 data showed that the Gaza strip has 20 general, 6 specialized, 3 Maternity and one rehabilitation hospitals. 13 of these hospitals were run by

MOH, 12 by nongovernmental sector, 3 military hospitals and 2 by private sector. They were distributed as 15 in Gaza zone, 6 in the North, 5 in khanunis, 3 in Rafah and 1 in the mid zone.

### 1.6.6 Ocular care services

Eye services developed gradually in MOH, it was provided within a small department at Al Shifaa Hospital till 1972, then Al Nasser Ophthalmic Hospital (NOH) was established to deliver ocular services to citizens from all over GGs (NOH, 2012 a).

Regarding MOH hospitals, ocular services provided in an expanded manner through mainly two hospitals, (NOH) &European Gaza hospital (EGH) (MOH, 2012).

NOH is the central hospital for eye care in Gaza Strip; it provides surgical and clinical services in addition to emergency and primary care through many ophthalmology sub specialties and departments (NOH, 2012 a), while in EGH eye services provided through ophthalmic department at the hospital which established in 1999 to serve south Gaza strip. Both hospital's services delivered through ophthalmologist, general practitioners, optometrist practitioners in addition to supporting nurse staff, anesthetists and pharmacists (MOH, 2012).

### 1.6.7 Al Nasser Ophthalmic Hospital (NOH) context

NOH considered as the first governmental surgical and clinical hospital, which provides eye services for citizens from all GG, and it is accredited as a training center for specialty of Ophthalmology by the Palestinian Medical Council (NOH, 2012 a). NOH consists mainly of two parts; clinical and surgical, in addition to emergency department.

The annual report at the end of 2014, the hospital provided services for total 112156 patients. Department of emergency received 71655 patients (Male - 39823), (Female - 31831), distributed among GG as the following: North Gaza 18149, Gaza 48993, Middle zone 3656, khanunis 579, Rafah 278. Total number of 40501 patients received services at NOH outpatient clinics (Male - 18922), (Female - 21579), distributed as the following among GG: North Gaza 10132, Gaza 22380, Middle zone 5273, khanunis1705, Rafah 1011 (NOH, 2014).

In the beginning of 2015, NOH started different subspecialty services through eight units in out clinic department, Retina unit, Cornea unit, Glaucoma unit, Cataract unit, Pediatric unit, Laser unit, Oculoplastic unit, and General unit (NOH, 2015).

NOH includes optometry department, which emerged in ocular services at MOH in 2008, consists of two refraction units, contact lens's unit pediatric and squint unit, prosthesis unit and diagnostic unit. At the end of 2014 optometry department provided services to the total number of 5073 patients, 3083 Health School students 1990 in addition to many a service at out clinic department units and emergency department (NOH, 2012 a).

Surgical department consists of three major operation rooms and one minor operation room, at the end of 2014 NOH provided (Minor operations 11228), (Major operations 4388). NOH consists of the following professionals: Ophthalmologists 22, Nurses 37 Optometrists practitioners 13, General practitioners 8, Pharmacists 4, Antitheists 1, Antitheists assistance 4, in addition to 28 employees working in administrative department (NOH, 2014).

### 1.6.8 European Gaza hospital

European Gaza Hospital (EGH) was established in 1999 on an area of 65 thousand meter squares. Located in the eastern side of Khan Yonis City, EGH provides different medical specialties, including medical and surgical services with a total bed's capacity of 246 beds. In 2013; the total number of admitted cases was 17648 cases; bed occupancy rate was 82.4%, bed residency rate was 4.33 days (MOH, 2013).

EGH considered as the second governmental surgical and clinical hospital, which provides eye services for citizens from south area of Gaza. EGH consists mainly from two parts; clinical and surgical, in addition to emergency department.

### 1.7 Operational Definitions

**Quality of Life:**

WHO defines Quality of Life as individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, a level of independence, social relationships, personal beliefs and their relationship to salient features of their environment. (WHO, 2012).

Operationally, QOL refer to the response of glaucoma patient on the domains of the QOL as measured by the scores obtained using SF-36 and GQQL-15 instrument**s.**

**Glaucoma:**

Glaucoma is a multifactorial ocular disease with characterized by progressive degeneration of the optic nerve and visual field loss. (Foster et al., 2002; Quigley, 2011).
In this study, it refers to the case of glaucoma diagnosed by ophthalmologist and identified through medical record.

**Level of QOL:**

**High** level QOL: from (75 -100 %), **Moderate** (medium) level QOL: from (50 -75 %)
**Low** level QOL: from (below 49 %) from WHO (1995) manual.

# Chapter (2) Literature Review

## 2.1 Conceptual framework

The Conceptual framework is considered a basic component of the scientific research. It represents the infrastructure of study. It connects and explains the relationship between the dependent and the independent variables. The conceptual framework of the study as shown in Figure 2.1 illustrates variables that interact and affect the quality of life among Glaucoma patients. All these factors interact in different degrees with each other, consequently, affecting QOL either positively or negatively.

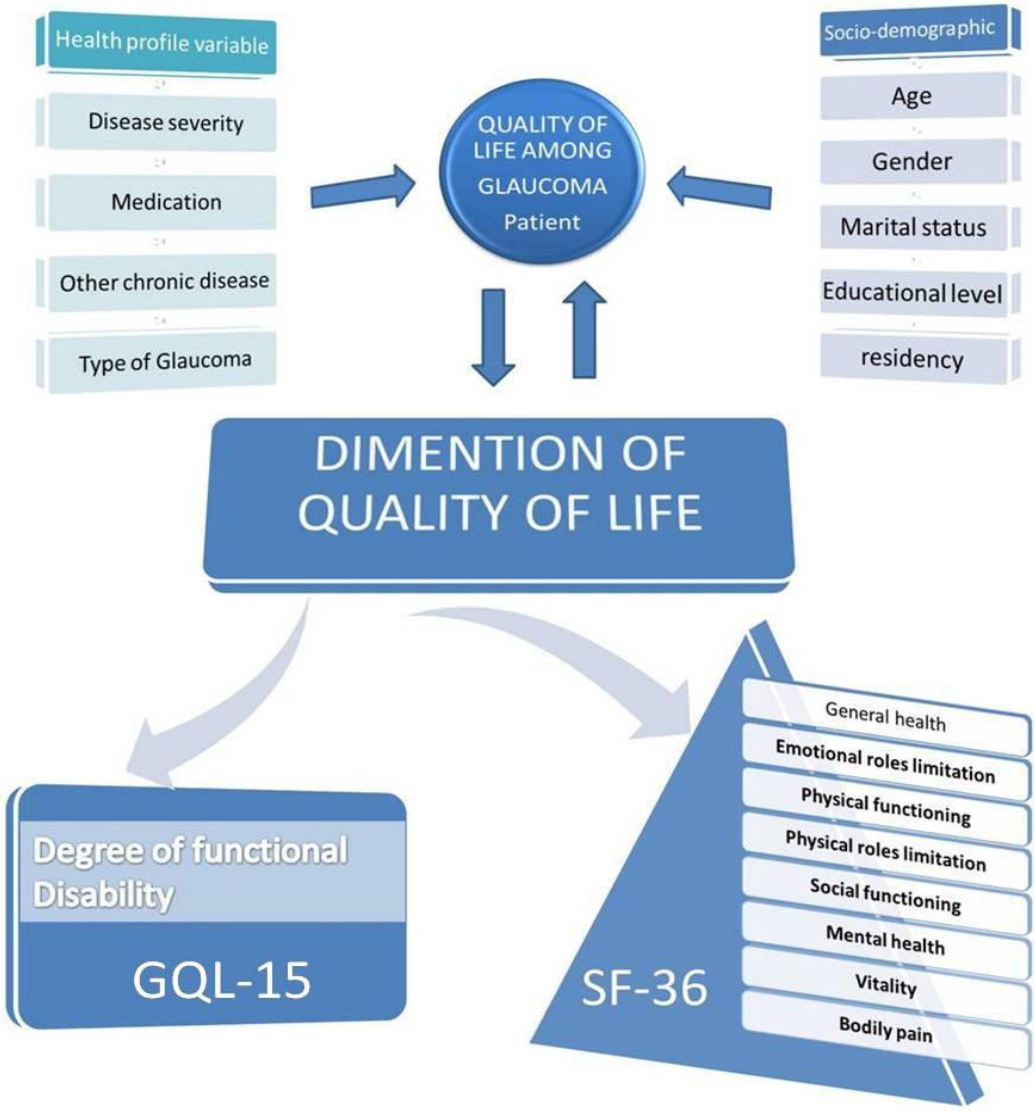



**Figure 2.1: Conceptual framework**

### 2.1.1 Patient related variables

Demographic characteristics: include age, gender, educational level, marital status, and residency. These factors directly affect patient QOL.

Socioeconomic characteristics: include income, and employment status. These factors have a direct effect on patient QOL.

### 2.1.2 Health profile variables

Health Profile Variables include the type Glaucoma, Duration of the disease, comorbidities, another ocular disease, compliance with treatment. These factors directly affect the patient QOL.

### 2.1.3 QOL dimensions

#### 2.1.3.1 Sort Form-36 Domains

Physical Component: It includes physical functioning, physical role, bodily pain and general health.

Mental Component: It includes vitality, social functioning, emotional role and mental health.

#### 2.1.3.2 Glaucoma Quality of Life -15 Domains

GQL-15 Component: It includes: Central vision, Peripheral vision, Outdoor mobility, Glare and Dark adaptation

## 2.2 Literature review

### 2.2.1 Glaucoma

Glaucoma is a progressive, chronic optic neuropathy that may result in a functional loss of vision (i.e., visual impairment); it is the second-leading cause of blindness worldwide. Glaucoma is typically characterized by increased intraocular pressure, retinal nerve fiber and optic nerve damage, and progressive loss of visual fields (Anderson, 2006; Cassin et al, 2006). It is usually referred to as the ‘silent thief of sight.’.

#### 2.2.1.1 Epidemiology

The number of people with glaucoma worldwide is expected to rise from 64 million to 76 million in 2020 and 111 million in 2040, with Africa and Asia being affected more heavily than the rest of the world. (Tham, 2014). Primary open angle glaucoma is the most

common form of the disease worldwide. The highest prevalence of Primary Open Angle Glaucoma (POAG) are in African countries.

Glaucoma prevalence is difficult to determine due to differences in defining disease, expertise of measurer, and diagnostic equipment. A 2014 review of worldwide POAG prevalence among people aged 40-80 years showed estimates of 2.31% in Asia, 3.65% in Latin America and the Caribbean, and 4.20% in Africa. (Tham, 2014). A review that focused on multiple Asian populations found that the prevalence of POAG ranged from 0.5% in a Mongolian population to 3.9% in a Japanese group. (Cho, 2014; Foster et al., 1996; Iwase, 2004). Another study, based in West Africa showed a POAG prevalence of nearly 15% in individuals over the age of 80. (Budenz, 2013).

In the Arab world, there is no complete reliable data on the exact prevalence of glaucoma despite for some researches that were criticized by other researches due to limitation of inclusion criteria and classification of types of glaucoma.

Here in Gaza strip, there is no reliable published data regarding the prevalence of glaucoma and glaucoma subtypes. The approximate number do not represent 12% of the real cases due to under registration problem. However, expectations from many doctors interested in this issue estimate that the majority of cases of glaucoma are open angle glaucoma (Almost 70% of all cases) without precise provision or classification of POAG or PACG subtypes.

People with a familial history of glaucoma are among the most at risk for developing the disease. Race and age are statistically significant risk factors. Glaucoma is most prevalent in China, India, and Europe (Quigley & Broman, 2006).

Additional risk factors strongly associated with a severity of glaucoma include myopia, hyperopia, cardiovascular disease, diabetes, eye injury, and the use of cortisone steroids (Dahl, 2013; Schuman, 2008).

People with glaucoma show characteristic behavior that is the consequence of both changes in vision and of the increased effort to overcome challenges in daily living to maintain their independence. It is critical to know that people are typically unaware of changes in their vision as the result of glaucoma until later stages of the disease progression, a point at which constant vision loss has already occurred.

As described in the quality of life researchers, driving, mobility, involvement in the community (crossing the road, reading street signs), reading, adjusting to different levels of illumination, contrast sensitivity, judging distances, and peripheral vision-dependent tasks were affected by glaucoma (Goldberg et al., 2009; Nelson, & Aspinall, 1999; Ramulu, 2009; Ramulu, et al., 2012; Spaeth, 2006; Viswanathan et al., 1999).

Alterations in mobility were characterized by slower walking and reaction times, impaired perception of motion, and bumping into objects located in the periphery (Kuyk et al., 1998; Turano et al., 1999; Viswanathan et al., 1999)

Notable that, people with severe glaucoma involved additional value to the integrity of their central vision in the advanced stages of the disease than they did in the early stages of the disease (Spaeth et al., 2006). This reveals the pathological progression of the disease; that the central visual field is commonly not compromised until the advanced stages.

### 2.2.2 Classification of glaucoma

At this time, glaucoma is classified into primary and secondary. In primary glaucoma, the optic neuropathy is the consequence of primary defects in the circulating pathway of Aqueous Humor (AH) or within the neural retina or the ganglion cells themselves. In secondary glaucoma, the optic neuropathy or glaucomatous symptoms occur due to some other ocular or systemic disease or defects.

**Major types of primary glaucoma**

1. Primary open angle glaucoma (POAG)/chronic open angle glaucoma (COAG): Currently, the idea that high IOP is the exclusive cause of optic neuropathy has been almost discarded,

since in many patient's optic neuropathies occurs at normal IOP (Foster al., 2002; Quigley, 2011). POAG is now defined as significant optic nerve damage in the eye, which does not have evidence of angle closure on gonioscopy, and where there is no identifiable secondary cause. POAG is the most prevalent type of glaucoma.

2. Primary closed angle glaucoma (PCAG): Patients having narrow or closed anterior chamber angle associated with significant obstruction of trabecular meshwork and glaucomatous optic neuropathy. PCAG can be subdivided into subacute, acute, chronic,

symptomatic or asymptomatic according to the nature and severity of the onset. The worldwide prevalence of PCAG is about one-third of the rest (Quigley and Broman,2006)

**Secondary glaucoma** may occur under many ocular or systemic conditions like:

1. Uveitis
2. Ocular trauma
3. Ocular neovascularization
4. Thyroid orbitopathy

### 2.2.3 Causes of glaucoma

Glaucoma is an age-related condition. There may be no single cause of glaucoma. Some significant risk factors have so far been identified. Elevated intraocular pressure is the most important risk factor. Glaucoma is commonly, but not exclusively, associated with an increase in intraocular pressure (IOP), and optic nerve damage may be a response to chronically elevated IOP and mechanical deformation (Hernandez, 2000; Johnson et al., 1996).

### 2.2.4 Consequences of glaucoma

Damage to retinal nerve cell's results in damage to the field of vision; the peripheral field is generally damaged first. Due to our eyes overlapping visual fields and the minor role peripheral vision plays in most people's perception of what they see, sight loss may not be noticed until it has reached a significant level. Deterioration usually progresses slowly, over years, although some types of secondary open-angle glaucoma may progress more rapidly.

### 2.2.5 Risk factors for glaucoma

The major risk factors for glaucoma are:

» Age: incidence increases with age, most commonly presenting after the age of 65 and rarely before the age of 40 years; Older age is strongly related to glaucoma. Both incidence and prevalence increase with age (de Voogd et al. 2005; Leske et al. 2008), and older age is also a risk factor for glaucoma progression (Lichter et al. 2001; Chauhan et al. 2008b).

» Family history: Glaucoma in first- or second-degree family members is a risk factor, regardless of IOP (Hulsman et al. 2002; Leske et al. 2008).

» Race: Prevalence of glaucoma is higher in people of African descent than in those of European ancestry (Leske et al. 1994).

» Raised IOP. Elevated IOP is the most important risk factor for both development (Kass et al. 2002) and progression (Heijl et al. 2002) of glaucoma.

### 2.2.6 Diagnosis and detection

It is expected that more than half the people with glaucoma in the developed world and 90% in the developing world have not been diagnosed early (Wittenborn and Rein, 2011; Burr et al, 2007).

Patients are often referred with a raised IOP, but this is not diagnostic of glaucoma. Evaluation of these patients includes:

- Measurement of IOP using a Goldman applanation tonometer mounted on a slit lamp.
- Measurement of the central corneal thickness (a thicker cornea may not be as indentable as a cornea of normal thickness, so the pressure inside the eye may be as high as it appears. Conversely, a thinner cornea may give an inaccurate low pressure reading)
- Visualization of the drainage angle using a special contact lens known as a gonioscopy lens.
- Visual field measurement using a standardized program.
- Assessment of the optic nerve through a dilated pupil using a slit lamp.
- Optic disc imaging should also be carried out, and the images should be available for all future visits to facilitate the detection of optic disc change. Imaging may take the form of standard photography or other modalities such as optical coherence tomography. (NICE, 2009).

Accurate diagnosis is difficult, particularly early on, and patients are often examined several times before diagnosis is made. High pressure is not indicative of glaucoma without changes in the retina. Glaucoma is usually associated with a rise in IOP but 20-52% of people with the condition have a “normal” IOP (≤21mmHg); this is known as normal tension glaucoma. Conversely, some people with a “high” IOP (>21mmHg) do not develop glaucomatous changes and are classified as having ocular hypertension. These patients are monitored as some do develop glaucoma.

### 2.2.7 Monitoring of Glaucoma

Glaucoma is a lifelong condition with a varied course. Monitoring is required to ensure control is stable, note changes and implemented treatment changes. Complete, accurate notes must be available at every clinic visit to ensure transfer of information between the community and hospital ophthalmic services, and stability of care.

### 2.2.8 Impact of glaucoma on visual function

Visual Functions we are referring to the performance of the visual system, more or less in isolation, under standardized measurement conditions. visual functions are measured using quantitative clinical tests. The specific visual functions include:
Visual acuity, Visual fields, Contrast Sensitivity, Color vision, Binocular Function.

The progressive damage of retinal nerve fibers from glaucoma leads to decrease in visual field, and the more nerve damage determines the severity of visual field loss. Primarily, glaucoma results in the reduction in peripheral visual field sensitivity and is the leading cause of visual field loss in the older population (Ramrattan et al., 2001).

In its early stages, reduced visual field sensitivity often goes unnoticed by the patient, until central vision is affected. Due to this and the progression of the disease, a large number of the population with glaucoma is undiagnosed and remains unaware of their condition (Weih et al., 2001; Friedman et al., 2004).

Central vision can also be affected in advanced stages of glaucoma, resulting in loss of visual acuity, contrast sensitivity and depth perception. Also, Contrast sensitivity is also impaired with more advanced glaucoma.

### 2.2.9 Economic burden of Glaucoma

The prevalence of glaucoma contributes to significant costs that are both direct and indirect. (Rein DB et al., 2006). Direct medical costs include ocular hypotensive medication(s), physician and hospital visits, and glaucoma-related procedures while direct nonmedical costs include transportation, government purchase programs, , and nursing home care. Indirect costs reflect lost productivity, such as days missed from work, and can include the productivity costs borne by caregivers such as family members and friends.

The average direct cost of glaucoma treatment ranges from $623 per year for patients with early-stage glaucoma to $2,511 per year for patients with end-stage disease (Lee PP et al., 2006).

In view of the Palestinian reality, we find that the economic situation is very bad which led to an increase in poverty and unemployment and lack of availability of medicines and all due to the Israeli occupation of the Gaza Strip, all these factors led to that glaucoma patients in Gaza are suffering too, so they cannot get access to essential medicines for the disease. Which led to deterioration of the condition in patients with glaucoma in the Gaza Strip and the results that the quality of life in patients less than other studies.

Patients mention three main barriers to treatment (1) a poor understanding of glaucoma, (2) the financial burden of medication, and (3) side effects of treatment. These obstacles contribute to poor adherence and increase the risk of blindness.

In summary, the economic burden of glaucoma is significant and increases as the disease worsens (Varma et al., 2011).

### 2.2.10 Treatment

Treatment is aimed at achieving constancy, defined as no evidence of progression or progression at a rate at which visual impairment does not affect the quality of life. Moreover, the goal of treatment is saving vision by preventing more retinal nerve fiber degeneration and visual field loss. (Burr et al., 2007). If glaucoma is not progressing or is doing so very slowly, no treatment may be needed; in other patients, an aggressive or rapidly progressing disease can make treatment difficult. Treatment focuses on reducing IOP as this is the modifiable risk to retinal damage. Once a patient is diagnosed, a target IOP is established; this is the level the clinician believes is low enough to prevent disease progressing to a level that would impair the quality of life. Younger patients are likely to have to live with glaucoma for longer and so are given a lower target IOP than older patients (NICE ,2009).

Some, particularly older patients with very slow-progressing disease may be monitored without treatment as the disease is unlikely to cause disability in their lifetime. Progression at any age will necessitate changes in treatment. Benefits of reducing or stopping treatment may include removing the burden of regular medication. Drug therapy is the usual first treatment of choice; patients are started on single eye-drop therapy, with extra

drops added if the IOP does not reach the target. If a patient is on the maximum tolerable treatment, laser or surgical options may be considered (NICE, 2009).

#### 2.2.10.1 Drug treatment

The first-line treatment is usually prostaglandin analogue drops, which reduce IOP by increasing outflow of aqueous humor via the uveoscleral route (which usually only accounts for 10% of drainage). It may affect pigmentation of the iris and periorbital skin, and lash growth. These drops have the fewest side-effects of the drugs used to treat glaucoma. Second-line treatment is often the addition of a beta blocker to reduce aqueous humor production. Prostaglandin analogues and beta blockers may be given together to reduce the number of drops the patient must instill. Combination therapy also minimizes the amount of preservative entering the eye, thus reducing the risk of intolerance or allergic reactions. Preservative- free drops are also available.

All drugs have contraindications and side-effects, and regimens may change depending on the patient's systemic and ocular responses (Patient.co.uk, 2014). Patients at risk of sight loss despite treatment may have surgical and laser procedures, including Trabeculotomy and Trabeculectomy, which reduce IOP by artificially increasing drainage of the aqueous humor through the trabecular meshwork by means of laser or surgical tissue removal.

## 2.3 Quality of Life

### 2.3.1 History of QOL in medicine

The term QOL started to be used in the early 1960s after changes in the health and the demographic profiles of "late modern" societies. Public health agenda in the first half of 20th century was developed and articulated to help cope with the complex forms of mortality, the incidence, and prevalence of morbidity.

In other words, medicine focused its attention on a quantity of life. In the 1960s, there emerged another issue: quality of life. QOL was first mentioned in a medical field by Elkington in 1966. In the 1970s the term QOL started to be used in medicine as noted by Sharon Wood-Dauphinee (Wood-Dauphinee et al., 1999).

In 1977, QOL became a keyword in the Medical Subject Headings of the US National Library of Medicine MEDLINE Computer Search System. When QOL was introduced among the MeSH (Medicines Subject Headings), it was defined as "a generic concept

reflecting a concern with the modification and enhancement of life attributes, e.g., physical, political, moral and social environment; the overall condition of a human life" (Pennacchini et al., 2011).

QOL measures moved from being research issues for economists and others, to be explored by managers and the new specialists in public health medicine as potential attentions to guide health policy. Instead of providing more resources to meet needs, a better quality of services could be aimed at, within properly managed funds.

Thus, researchers focused their interests in the construction and testing of instruments designed to measure health and QOL. Medical social scientists faced major methodological challenges in developing a measure of QOL.

The researchers had achieved an agreement on the relevant factors of QOL among physicians, nurses, patients, family and others who were concerned about the patient.
The academic study of the patient's QOL received considerable attention, but it produced an argument about the relevance and feasibility of such investigations.

The development of new measures continued through the 1990s. During these two decades, methodological accuracy improved through the development of psychometric properties measurement (Wood-Dauphinee et al., 1999).

First, scientists developed generic and multidimensional questionnaires to acquire broad information on large groups of patients. Then, they developed disease-specific questionnaires aimed at evaluating the functional abilities of patients. (Pennacchini et al., 2011). At the same time, these questionnaires showed still some conceptual and methodological problems that made it difficult to use QOL in medicine.

Researchers did not build a conceptual model or a theory as a foundation for the construct of QOL that would allow clarifying relationships among its components. The field had been severely criticized for the lack of science in QOL research, which confused the understanding of what was being measured and what it meant (Gill et al., 1994).

In 1994, Albrecht wrote that theoretical work had lagged instrument development and validation because QOL research has largely developed inductively. So, in the mid-1990s there was a new attempt to define QOL with greater care.

It must be distinguished that changes in the concept of health, which had occurred during the second half of the 20th century had extremely affected and modified the idea of QOL: the concept of health had undergone major changes, passing from negative health measures such as the five D's - death, disease, disability, discomfort, and dissatisfaction -, towards more positive domain and features (Pais-Ribeiro et al., 2004).

World Health Organization (WHO) definitions of health and QOL are positively-oriented: health is considered "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (Whoqol Group et al., 2005). And from this new perspective on health have stemmed more positive measures aimed at assessing health and disease.

These new health measures have, in turn, affected the concept of QOL, which was defined by WHO in 1995 as individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations and standards and concerns. It is a broad-ranging concept affected in a complex way by person's physical health, psychological state, a level of independence, social relationship, and their relationships to salient features of their environment.

Despite these wide-ranging definitions provided by the WHO, there was no generally agreed definition of QOL. It should be noted that, among those research articles, some do provide a definition of the concept, but others do not, and some even attempt to measure the degree of QOL in various types of people, patients, population, etc., without proposing a conceptual definition. Whether a definition has been provided there has been, through the years, an increasing focus on QOL, that has resulted in a huge number of relevant publications in the scientific literature: "A PubMed search of articles published from 1966 to 2005 identified 76,698 articles containing 'quality of life' as a Medical Subject Heading or as a title or abstract term. Since the mid-1960s, the number of publications on this subject has grown exponentially" (Moons et al., 2006).

Some believed that variability across cultures, between patients, and in the same patient over time made efforts to define the term QOL impossible. They considered QOL as a mystery, so they thought that physicians and economists could avoid QOL assessment (Leplege et al., 1997).

In its place, other researchers believed that QOL was useful in introducing the patient's viewpoint into clinical practice and decision processes (Frank et al., 1998) and others proposed a new method for generic measuring of global QOL (Ventegodt et al., 2003). The idea that the patient's perspective is as valid as that of the clinician when it comes to evaluating outcomes had much of legitimacy and should certainly not be abandoned.
However, in recent years there has been a call for the explanation of this term within the medical context, more specifically *health-related quality of life* (Farquhar, 1995).

### 2.3.2 Definition of QOL

Quality of life is a progressively important subject both in scientific research and patient care. This increasing approval can be explained by the broad recognition that QOL is a highly relevant outcome measure in medical treatment, establishing an important addition to the traditional biomedical endpoints such as limitations in the functioning of organs, senses, or limbs or mortality (De Vries, 2001).

Since the early 1970s, concern in the QOL concept has raised significantly in clinical practice and research. QOL has been of dominant importance for evaluating the quality and the outcomes of health care. Despite its value, there is still no consensus on the definition or proper measurement of QOL.

There is no agreement about the definition of quality of life. Some articulate that there is more misunderstanding on what quality of life means than on any other concept in social, medical, and psychological research (Dijkers, 2005).

Currently, social researchers evaluated quality of life by assessing socioeconomic status, housing, education, and neighborhoods. Agreement definition of quality of life has not been reached because the quality of life is an ambiguous concept and a multi-axis term (Bowling, 2001).

WHO defines QOL as "an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations' standards and concerns. It is a broad-ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships' and their relationships to salient features of their environment" (WHO, 2012 Bowling, 2003).

Two aspects to this definition are mostly important. First, it shows that QOL is a subjective concept that refers to positive as well as negative aspects of life, and second, QOL appears to be a comprehensive and multidimensional concept.

Health care professionals thus should give special attention to not only the influence of the disease or handicap on the everyday functioning of their patients (that equal health status), but also to their patients' satisfaction with their physical, psychological, and social functioning (that equal QOL) (De Vries, 2001; De Vries and Drent, 2006).

Defining QOL in terms of satisfaction with life is most suitable. It reflects the degree to which a person completely evaluates the overall subjective and objective components of his or her life. Furthermore, QOL refers to the level of enjoyment and satisfaction with the life led so far. Other definitions of QOL have been to emphasizing components of happiness and satisfaction with life (Fayers et al, 2001). Raphael et al., (1996) quality of life as: the degree to which a person enjoys the important possibilities of his or her life.

Diverse sciences focus on aspects of QOL, representing their own discipline, within nursing sciences and medicine. The focus in QOL is the relation to different degrees of health, symptoms, illnesses and treatments because these are the domains of the health care professionals (Pinar, et al, 2003).

QOL is a broad, complex and multidimensional concept, which includes an assessment of the ability of the patients to meet their needs and how they react to the limitations they face. It is therefore, subjective, individualized and difficult to measure but its assessment is crucial to a holistic understanding of patients.

QOL has been developed as a worldwide concept that is affected by several factors. To, it is considered that individuals are the only ones who can dependably estimate their own QOL (Ferrans, 1996). Situation of individuals, religion and culture influences it (Patel, 2006).

QOL is affected by the environmental, socio-economic and health conditions in which an individual finds himself. The dimensions of QOL include psychological health, physical health, social relationships and environment.

### 2.3.3 Definitions of "Health-Related Quality of Life"

There are many diseases or health conditions, including eye diseases, that can affect a person's health-related quality of life (QOL), which refers to "the extent to which patients' perceived physical and mental functioning is affected on a day-to-day basis by a chronic disease" (Centers for Disease Control and Prevention).

Although experts continue to disagree on the definition of quality of life, there seems to be a consensus that Health-Related Quality of Life (HRQOL) considers the level of physical, psychological, and social functioning, and that it includes abilities, relationships, perceptions, life satisfaction, and well-being. (Wood-Dauphinee, 1999)

Researchers are not concerned in quality of life in its wide sense in health research, thus, the term "Health-Related Quality of Life" was brought in. HRQOL been defined as a multidimensional construct, it emerged to highlight the effects of health, illness and treatment on quality of life, (Bowling, 2001), while health according to WHO definition can be considered as "a state of complete physical, mental, and social well-being, not merely the absence of disease and infirmity".

In similarity with the WHO definition of health, health-related quality of life refers to the overall conditions of quality of life of ill or healthy subjects in harmony with the following eight domains: limitations in physical activities because of health problems, limitations in social activities because of physical or emotional problems, litigations in role activities because of physical health problems, general mental health, limitations in role activities because of emotional problems, bodily pain, vitality, and general health perceptions of an individual or a group measured in terms of feelings of satisfaction or dissatisfaction (Ware and Sherbourne, 1992).

Health-related QOL is the functional effect of a medical condition and its consequent therapy for a patient. It is an important indicator which when measured can be used to quantify the degree to which a disease, and its treatment affect the patients' life.

The measurement of health-related quality of life is a subjective assessment of one's own -welfare- a perception to the degree of satisfaction with an ability to perform and control different facets of one's life (Molassiotis et al., 2001).

Its measurement together with traditional clinical measures takes a more comprehensive picture of the burden of disease experienced by patients.

Ophthalmologists and optometrist use the term (vision-related QOL) to distinguish the fact that their area of primary interest is the effect of visual loss or impairment and the treatment of eye disease on patients' ability to function optimally. Vision- related QOL has been defined as 'a person's satisfaction with their visual ability and how their vision impacts on their daily life' (Asaoka *et al.*, 2011).

Several multidimensional factors influence QOL. The socio-demographic characteristics of individuals (age, gender, and educational status), life experiences and culture may affect an individual's QOL. Individualized characteristics such as patient's nature, personality (Warrian *et al.*, 2009) and life expectations also influence QOL. Interest in general health-related QOL measures in health research has led to the development of questionnaires which examine the physical, emotional and social aspects associated with a disease.

These multidimensional instruments measure the impact of health problems on general health status, and allow for a common metric to compare between different diseases. It should be noted that the HRQOL can be assessed using either a generic or a disease - specific questionnaire, the WHOQOL and Medical Outcomes Study short form health surveys, SF-36 are an example of a generic HRQOL questionnaire. These questionnaires are designed to measure the most important aspects of HRQOL.

### 2.3.4 Interest of studying quality of life

Quality of life was considering a significant factor in the examination of patient responses to disease and treatment. In last two decades, the concept of quality of life has more and more applied to study and evaluate the health status of patients suffering from chronic illnesses (schalock, 2004).

Schalock also pointed out that the concern in quality of life has come from four sources. First, increasing need of customer empowerment and patients' rights has led to interested-on patient-centered care that quality of life is an element of that.

Second, the huge development of medical technology may have led to improve quality of life to raise understanding of the welfare of person, family and community.

Third, provide good care puts the community services under the pressure to evaluate and measure the results of quality of life for individual's enhancement in the community.

Four, the presence of research within the field of sociology has introduced the perceptual aspects of quality of life, and the individual characteristics involved producing the need for additional research.

The requirement to include patients' empowerment, family involvement and support as well as the availability of community services led to increase interested to study QOL. Strength of mind quality of life allows for benchmarking of the disease across populations. This provides an improved understanding of the burden of disease that patient's knowledge and is informative to providers, clients, families, and others.

Measure the effect of treatment by using QOL focusing on the viewpoint of the patient provides opportunities to tailor therapies. (DeSalvo et al., 2006 and Dominick et al., 2002). Finally, improve patient-provider communication has been shown by use of quality of life in order to create a more patient-centered environment (Velikova et al., 2004).

**2.3.5 Uses of quality of life**

Quality of life is the most notable client outcome measure in health outcome research to evaluate and thereby improve the quality of health care provided for the patients (O'Connor, 2004).

Frist, to encourage health care providers and direct the health care providers to areas of the patient's concern and to ask about specific aspects of the health and well-being of their patients (O'Connor, 2004).

Moreover, to examine the effect of health program and distribute the health care resources appropriately and evaluate the effect of clinical therapies; the consequences of treatment and treatment-related side effects may influence patients' life. (Bowling, 2001 and O'Connor, 2004).

Also, to give a complete appraisal of a personal health and well-being, apart from physiological measures (Dempster and Donnelly, 2000).

Finally, to enhance the communication, exchange of idea and interaction with patients by collect information about patients' conditions. SO, the clinicians can communicate with patients and understand the consequences of patient's illness and its treatment (O'Connor, 2004).

### 2.3.6 Measurement of QOL

QOL needs to be considered when evaluating the knowledge and outcome of patients receiving health care because it's an important parameter. This is particularly the case for patients with long term chronic diseases, since a complete cure from their illness is often impossible (Macduff, 2000).

Additionally, there is arising from need for global principles to measure QOL in a way that allows comparisons across cultures. In the meantime, the global standards must be relevant to individual cultures. The known differences between Western and Eastern cultures may be reflected on the QOL measurement results (Ayoub, 2012).

QOL is multidimensional and highly subjective and for this reason, its measurement is difficult. QOL questionnaires are also called tools, or instruments. They measure multiple characteristics referred to as scales, or domains and are comprised of questions known as items. QOL assessment tools are quantitative measures, which allow comparable, reproducible, responsive and valid functional health status determination to be made. Measurement of QOL is done using either preference based or functions based instruments.

Preference based instruments assess the value placed by patients on their QOL while function based tools use items to grade the degree of difficulty patients experience while performing vision-related tasks (Aspinall *et al.*, 2007).

QOL domains may differ depending on the questionnaire being used or the research question being studied but essentially, most questionnaires try to include aspects of life, which may affect the quality of one’s life.

QOL is measured by administrating a questionnaire formed by items or questions to participants whose QOL is of interest. Most often, each item is answered on a Likert scale. The items are grouped into several domains. Each domain refers to a scope of behavior or experience.

### 2.3.6.1 QOL domains: Annex (2)

- Felce suggests 6 possible QOL domains based upon a synthesis of life domain areas (Felce, 1997).
- Schalock proposes 8 core dimensions in his conceptual model of QOL. (Schalock, 2000).
- Keith refers to the consensus that has developed internationally around Schalock's model (Keith, 2001)
- The World Health Organization QOL Assessment comprises 6 domains. The (WHOQOL Group, 1995).
- Hagerty et al proposed 7 domains (Hagerty et al 2001)
- Lastly, Cummins proposed 7 core domains (Cummins, 1997)

### 2.3.6.2 Benefits of QOL Measurement for Glaucoma

Measurement of QOL in glaucoma patients is essential for several reasons. Primary open angle glaucoma (POAG) which is commoner than angle closure glaucoma in most popula tions, is essentially symptomless, can lead to irreversible blindness if untreated and requir es lifelong follow up irrespective of the treatment modality employed. There is no cure fo r glaucoma and vision loss from glaucoma cannot be restored to the level of knowledge a vailable at present although research is on-going.

The goal of treatment in glaucoma is therefore, to improve clinical outcome by preventing further progression of the disease and ultimately preserve or improve the patients QOL.

It is impossible to preserve or improve something that has not been measured. This is even more important in a disease like glaucoma where some treatment effects may only be detectable by patients.

QOL assessment has the following advantages:

- It improves the doctor's understanding of patient's challenges with performance of everyday tasks needing good vision.
- It makes information about how glaucoma affects QOL and how these effects are modified by treatment. This information is useful for patient counseling, which helps patients make informed treatment choices during their management (Mills, 1998).

- QOL assessment process may help evaluate the economic impact of current and new therapies.
- May contribution in assessing the quality of care given to patients.
- It can be used to quantitatively assess patient's satisfaction or to detect increasing visual burden.
- It can assist clinicians suspect other problems if there is a discrepancy between QOL scores and severity of disease.

#### 2.3.6.3 Types of QOL measurements:

Global, generic, and specific instruments represent three different types of measures in the assessment of quality of life (Wiklund et al., 2000)

- **Global measures**

Those types are designed to measure QOL in a comprehensive or an overall manner. A single question can be asked to someone to rate his or her QOL or an instrument such as the Flanagan QOL scale that asks people to rate their satisfaction on 15 domains of life (Eljedi, 2005).

- **Generic measure**

The Generic type has much in common with the global type and designed mainly for descriptive purposes. In health care, they point out to the impact of an illness or its symptoms on the patient's life. Generic measures are applicable to a wide range of populations (WHOQOL-BREF instrument).

The main advantage is their broad coverage, and they allow compressions of different patients or cross studies. On the other hand, their disadvantage is their inability to address topics of relevance for a given disease (ELjedi, 2005).

- **Specific measures**

These types come to complete the side of *specificity* related to many health conditions and diseases. This has led in the development of condition or disease specific questionnaires. These focuses on a problem within a group of patients such as pain, fatigue, and physical functioning. These types are useful for monitoring specific problems eligible for an intervention (ELjedi, 2005).

#### 2.3.6.4 QOL Assessment Tools for Glaucoma

Various instruments have been developed and used to measure QOL of Glaucoma patients (Annex **3** show Tools types and uses).

The researcher uses general health questionnaire (SF-36) and Glaucoma specific disease (GQL-15). These instruments have been used because they cover all domains related to quality of life and have been appropriate for the Palestinian reality and suitable for the data that we will collect from the sample as well as the information that can be obtained from the patient file.

### 2.3.7 The Short Form-36 questionnaire

The Short-Form-36 questionnaire instrument used to assess and approve intervening methods to improve quality of life.

The Short-Form-36 questionnaire focuses on the participant's experiences, feelings, beliefs, perceptions and convictions concerning their health-related quality of life during the past four weeks. It consists of closed-ended structured questions. These questions are related particularly to the eight quality of life indicators and two summary measures that revolve around both the physical and mental health. Close-ended questions of the Short Form-36 questionnaire force participants to establish their responses from a range of possible answers (Stark and Roberts, 2002).

The Short-Form-36 questionnaire also allows one to access three main goals of both the natural and social sciences (Henslin, 2003)

The questionnaire enables the researcher/practitioner to predict or determine the possible outcomes regarding the quality of individual health and life.

The Short-Form-36 questionnaire provides possible solutions to improve health-related quality of life in each of the eight dimensions by suggesting possible intervening methods or programs.

#### 2.3.7.1 The eight health-related quality of life dimensions assessed by Short Form-36 questionnaire

The eight health-related quality of life dimensions assessed by the Short Form-36 questionnaire includes:

1- **General health:** This dimension assists the perception of the individual's general health. It is measured in terms of concepts such as excellent, very good, good, fair or poor, getting ill easier than other people or just as healthy as anyone he/she knows (Ware, 1993).

2- **Emotional roles limitation:** The scores on this dimension assess the extent to which the emotional condition of the participant, e.g. feeling depressed or anxious, limits his/her daily functioning and ability to perform roles, such as cutting down the -length of time used up on work ether activities and accomplishing less than he or she would like to (Ware, 1993).

***3*- Physical functioning:** The scores on the physical functioning domain scale refer to the extent to which the participant's perceptions of their quality of life are affected by their physical condition. In the first example, physical functioning indicates the extent to which the respondents can perform dynamic activities such as running, lifting heavy objects, participating in strenuous sports, climbing several flights of stairs and walking more than a kilometer. In the second case in point, it involves the performance of moderate activities such as bending, kneeling, bathing and dressing (Ware, 1993).

**4- Social functioning:** This dimension refers to social activities and interaction significantly with others such as family members, friends, neighbors and other social relations (Ware, 1993).

**5- Physical roles limitation:** This dimension attributes to the degree to which participant's performance of their roles in daily activities hindered by their physical state of health; for example, their ability to perform dynamic activities such as lifting heavy objects or to perform moderate activities such as moving a table or pushing a vacuum cleaner (Ware, 1993).

6- **Mental health:** This dimension of the respondent is measured in terms of the extent to what the participants are feeling nervous, downhearted and blue and feeling calm and peaceful also a happy person (Ware, 1993).

7- **Vitality:** The scores on this dimension indicate to what extent the respondent's experience of feeling active and full of energy, or worn out and tired (Ware, 1993).

8- **Bodily pain:** The dimension indicates to what extent the participant's experience of bodily pain reduces their performance of daily activities, involving work-related duties in the public environment and tasks within the home (Ware, 1993).

#### 2.3.7.2 Advantage of Using SF-36 Questionnaire

The SF-36 is a comprehensive approach also encourages individuals to enhance their QOL by becoming involved in joint decision-making and coordinated implementation strategies (Sato and Smith, 1996). The comprehensive approach of the SF-36 questionnaire encourages us to ask whether a health-related assumption is indeed true, and to question

those incorrect and inaccurate assumptions we are challenged with, regarding health and QOL (evaluate the truth) (Macionis, 2003).

Secondly, the SF-36 questionnaire is to assess the entire health-related situation of individuals, by concentering on the way in which they define and experience their QOL. Finally, a comprehensive approach promotes the empowerment of the individual in emphasizing the individual's ability to take control over his or her own QOL, through acting and by accepting responsibility for such actions (Sato and Smith, 1996).

### 2.3.8 Glaucoma Quality of Life-15 Questionnaire

Many of the glaucoma-specific questionnaires or instruments have been developed in the past two decades. The Glaucoma Quality of Life-15 (GQL-15) questionnaire is concise and easy to administer. (Nelson, 1999; Nelson, 2003)

Independent reviews have described it as one of the better glaucoma-specific instruments, with good acceptability among clinicians and patients. (Walt, 2011) Initially derived from a 62-item pilot instrument, the 15 itemGQL-15 was first described in 2003. These 15 items were selected based on their strong relationship with visual field loss in glaucoma patients. Several studies have used the GQL-15 (Goldberg, 2009).

The name for the instrument suggests that the trait under measurement is vision-related quality of life; however, all the items refer to activity limitation (near vision, peripheral vision, mobility, and dark adaptation) (Nelson, 2003).

The Glaucoma Quality of Life-15 questionnaire asks 15 rating-scored questions to assess the degree of functional disability caused by glaucoma. The questions used were the 15 most significant predictors of visual field loss derived from an original 62-point questionnaire. They include six questions relating to actions demanding functional peripheral vision, six relating to dark adaptation and glare, two relating to central and near vision and one relating to outdoor mobility.

The GQL-15 is a 15 item, the 4-domain tools that are short and easy to use. The instrument is based on the premise that perceived visual disability that significantly associated with binocular visual field loss. It has good internal consistency and reliability. The tool has been shown to demonstrate that difficulties in everyday life are mirrored by poor performance in several psychophysical tests. (Spaeth, 2006)

#### 2.3.8.1 The Four Glaucoma-quality of life dimensions assessed by GQL-15 questionnaire

**1- Central vision**: The scores on this dimension assess the extent to which the central vision of the participant, e.g. Newspaper reading, recognizing faces were affected by glaucoma.

**2- Peripheral vision:** The scores on this dimension assess the extent to which the Peripheral vision of the participant, e.g. Tripping over an object, seeing objects come from the side, walking in steps/ stairs and Bumping into objects were affected by glaucoma**.**

**3- Outdoor mobility**: The scores on this dimension assess the extent to which the Outdoor mobility of the participant, e.g. Crossing the road were affected by glaucoma.

**4- Glare and dark adaptation:** The scores on this dimension assess the extent to which the Glare and dark adaptation of the participant, e.g. Walking after dark, seeing at night, adjusting to bright lights and Findings dropped objects were affected by glaucoma**.**

## 2.4 QOL and Glaucoma

### 2.4.1 Factors Affect QOL among Patients with Glaucoma Disease

#### 2.4.1.1 Demographic and Socioeconomic factors

**Gender**

Many researcher studying QOL take the gender of the study sample subjects as a very important factor affecting QOL. For example, in the study of **Tran HM *et al.*, (2011)** who conducted a population-based study in Nigeria to assess associations of visual function (VF) and quality of life (QOL) by visual acuity (VA), causes of blindness by VF/QOL questionnaires among 2076 participants reported that the women had worse QOL compared to men. **Also, Lim *et al.*, (2016)** conducted a study to assessment of Depression, Anxiety, and Quality of Life in Singaporean Patients with Glaucoma reported that a relatively high prevalence of depression (30%) and anxiety disorders (64%) among glaucoma patients in Singapore. Female glaucoma patients are more likely to suffer from depression.

Moreover, **Tastan *et al.* (2010)** conducted a study to investigate the relationship between anxiety, depression, and quality of life in patients with glaucoma. Case-control study was carried out with 121 participants with glaucoma (M age=64.2, SD=13.2; 68 women, 76.0% married) and 64 controls by using (NEI-VQ25). The result showed that the anxiety risk in women with glaucoma was found to be 7.5 times higher than in men in Turkish patients with glaucoma. **In contrast, Labiris *et al.* (2010)** conducted a cross-sectional study in Greek to assess the vision-specific quality-of-life (VS-QOL) of Greek glaucoma patients, and the impact of potential influencing factors by using (NEIVFQ -25) 121 patients. The result found that female glaucoma patients had worse QOL (lower NEIVFQ scores) than male patients. Also, **Jain et al. (2015)** conducted a study to assess quality of life of glaucoma patients as per WHOQOL-Brief *among* 100 patients, reported that QOL of male better compared to female except in (social domain) female better than male.

**Age**

With population aging, the number of people with visual impairment and blindness is rapidly growing, as many eye diseases are more widespread among the elderly. (Bourne et al. 2013). The main causes of visual impairment were cataracts, refractive error and glaucoma and Visual impairment was found to be associated with advancing age **(s Oluleye et al. 2014)**. Also, **Goldberg et al. (2009)** conduct study to measure and compare quality of life in patients with and without glaucoma using the Glaucoma Quality of Life-15 Questionnaire, and to determine the association between glaucoma-related quality of life and clinical indices of glaucoma. Using a prospective, cross-sectional study, we collected demographic information via interviews and administered the questionnaire to assess glaucoma-related quality of life in 121 patients with glaucoma and 31 subjects without glaucoma. The result showed that the younger glaucoma patients have greater vision-related problems than older patients with glaucoma.

**Education level**

Many studies reported that not only was reported happiness associated with income and being employed but was also for highly educated. **Odberg, T et al, (2001)** who conducted a cross-sectional study to evaluate the feelings and experiences of patients living with glaucoma using a **s**elf-administered questionnaire, A total of 589 questionnaires were returned. The result show more than 80% reported negative emotions on learning that they had glaucoma, so giving a patient a diagnosis of glaucoma influences his quality of

life negatively and found that less educated patients were more afraid of going blind from Glaucoma. Also, **Zhou et al. (2014)** that's conduct study to assess vision-related quality of life (VRQOL) in Chinese glaucoma patients and explore its sociodemographic, clinical and psychological correlates by GQOL-15 reported that QOL of patients with high education was better in all four domains.

**Marital status**

Some have argued that human need is the foundation for QOL. As can be seen marital status reported in many studies as a factor paly role in affection QOL.

From **Tran HM *et al.*, (2011)** who conducted a population-based study in Nigeria to assess associations of visual function (VF) and quality of life (QOL) by visual acuity (VA), causes of blindness by VF/QOL questionnaires among 2076 participants, reported that married respondents had better QOL scores than unmarried ones. Also, **Zuo *et al.* (2015)** conducted a study to assess Vision health-related quality of life in Chinese's glaucoma among 202 patients using Chinese-version low vision quality of life questionnaire (CLVQOL) reported that VRQOL of married glaucoma patients was probably better than that of patients who were unmarried.

**Income**

Adequate income has implication for health, education, nutrition, opportunity for leisure and social participants. Higher level of QOL (well-being) have been reported to be associated with higher income. **Jain et al. (2015)** who conduct study to assess quality of life of glaucoma patients as per WHOQOL-Brief *among* 100 patients, reported that QOL of patients with high income was better, and Poor quality of life in all four domains was found to associate with lower income.

**2.4.1.2 Health profile factors**

**Compliance with treatment**

Glaucoma patients are more likely to be adherent to their medication if they understand the disease and the rationale for treatment and if their treatment regimen is simplified (Robin *et al.*, 2011). The fear of blindness can have several effects on the patient's attitude. It may create a healthy care that makes the patient extremely compliant and adherent to drug usage and follow-up visits which is useful. **Loon, S. C et al, (2015)** who conducted A cross-sectional, prospective study, using interviewer-administered survey questionnaires

to (I) To evaluate the medication adherence rate of glaucoma patients in Singapore. (ii) To evaluate patients' quality of life status. (iii) To explore the factors related to patients' nonadherence to medication for 314 patients, Patients' quality of life was evaluated using Glaucoma Symptom Scale and The Glaucoma QOL questionnaire. The result showed that the full-adherence rate is low among glaucoma patients. Having less beliefs in the need for and more concerns about their medication are the 2 factors associated with nonadherence, and Nonadherence has an association with decreased quality of life.

**Duration of the disease**

Duration of disease could lead to the extension of suffering from the consequences and progression of glaucoma. **vanGestel, et al, (2010)** who conducted a cross-sectional study in seven hospitals at Netherland to investigate the relationship between visual loss in glaucoma and HRQOL by using (EQ-5D), (VFQ-25) and (GQL-15) for 537 patients. The result found that visual acuity, side effect. Glaucoma surgery independently affects HRQOL, and it's important to prevent progression both in early and advance glaucoma.

Also, **Skalicky et al, (2008)** undertook a study to determine the prevalence of depression and its association with visual filed impairment, QOL and glaucoma severity. Cross-sectional study among 165 patients by using (GQL-15), and the result showed prevalence were more with increasing glaucoma severity. QOL scores reflect a decrease QOL with increasing glaucoma severity (age, 70 to 79 y).

In Nigeria**,** a hospital -based- cross sectional analytic study to evaluate the quality of life of (POAG) for 132 patients by (NEIVFQ25), (GQL-15). The result from the study showed that POAG patient had to reduce QOL even in the early stages, and clear trends of worsening QOL with increasing severity of disease. **Onakoya et al, (2012)**

**Presence of other (ocular – chronic) disease**

Other chronic conditions also produce problems in pain and discomfort or daily activities, Therefore, visually impaired patients with other chronic conditions maybe have more problems in a greater number of daily activities. **Lin *et al.* (2010)** conduct A retrospective, nationwide, case-control study using an administrative database to Comparison of comorbid conditions between open-angle glaucoma patients and a control study, the study group comprised 76,673 OAG patients. The comparison group comprised 230,019 subjects

matched to the study cohort. The study showed that Open-angle glaucoma patients are significantly more likely to have comorbidities.

Also, **Sung *et al.* (2017)** who conducted a study to evaluate vision-related quality of life in Korean glaucoma patients and to explore the associated factors. A total of 907 Questionnaires (NEI VFQ-25) were collected. The result showed that the lower (NEI VFQ-25) Rasch score showed a significant association in the presence of other ocular diseases.

**2.5 Local studies on QOL**

Regarding to local studies reviews, apparently that no studies were conducted before on QOL among Glaucoma patients in GG, thus researchers compared the study results with results of available studies on QOL among different target populations.

**Elayyan (2007)** conducted a study to evaluate the QOL among hypertensive patients attending governmental and UNRWA clinics. The researcher used a descriptive, analytical cross sectional design; the study sample included 340 patients aged between 40-71 years, who had hypertension at least for two years by used WHOQOL-BREF questionnaire. The results of the study revealed that the percentage of the total scores of the QOL among the whole study sample was (65.63%); the highest domain was the social (70.14%) while the lowest was the environmental (62.40%). Demographic characteristics, including age, sex, marital status, educational attainment, duration of disease, monthly income, family size, employment and clinic visited, were statistically significant except for some domains pertaining to some groups. Physical, psychological and social domains were lower in the group of monthly incomes of 300 NIS or more, in comparison with the group of monthly incomes of 2001-3000 NIS. Regarding the marital status, psychological and social domains were higher in the married group in comparison with divorced group, but the physical domain in the divorced group was better than that in the married group.

Cross-sectional design study was conducted by **Luzon (2008),** aimed to examine the QOL and to identify most common factors influencing the QOL in long-term rehabilitated stroke survivors in GG, by using Short Form-36 (SF-36). The study shows that, the stroke survivors had good QOL with 55.6%. The mental health was the best QOL domain (81.28%), followed by general health (77.77%), body pain (76.24%), and vitality (71.6%) almost similar with social functioning (71.39%).The poorer QOL domain was role

limitation due to physical health (28.05%), followed by physical function (40.89%), and role limitation due to emotional problems (42.97%).

**Hannoun (2012),** a quantitative cross-sectional study aimed to investigate the perceptions of Ischemic Heart Diseases (IHD) patients in Gaza City regarding their QOL, and the factors influencing their life status, conducted, by using a self-constructed questionnaire, which focuses on a new aspect of QOL like lifestyle, severity of IHD and health care. A convenience sample of 208 IHD patients from Al-Shifa medical complex were completed the questionnaire. Regarding participants' evaluation of their QOL level (global value); 38% were rated their QOL as neither good nor poor, 24.5% were reported it as good and 10.6% as very good, while 22.1% described it as poor and 4.8 % as very poor QOL (Hannoun, 2012).

**Khleif and Imam (2013)** did a study in the three main hospitals - Beit Jala Governmental Hospital, Watani Governmental Hospital, and Augusta Victoria Hospital - for cancer care in the West Bank, between May 1, and July 31, 2012. Patients aged 18-90 years with cancer who attended the hospitals for treatment and follow-up were selected by convenient sampling and had qualitative in-depth interviews. Ten patients completed the qualitative in-depth interviews and 323 of 350 patients (92%) completed the cross-sectional quantitative questionnaire EORTC QLQ-C30.The QOL domains with poor scores (mean score 48·5) were: physical role (48·8), emotional role (46·0), and social functioning (50·0), whereas the scores were worse for financial difficulties (64·6) and for symptoms (fatigue: 66·6, pain: 63·0 and insomnia: 56·4). These results were worse than those of patients with cancer in Kuwait, Turkey, and the UK (Khleif and Imam, 2013).

**Al-Nahhal, (2013)** conducted a descriptive, analytical cross-sectional study in GS. The general purpose of the study was to assess the QOL among end - stage renal disease patients undergoing hemodialysis in Gaza Governorates through administered questionnaire (WHOQOL-BREF questionnaire) with a response rate of 97%. The total score of QoL among ESRD patients at mean 76.12, and results showed that,55% of study participants revealed negatively about their quality of life, where 20%of participants rated their quality of life positively and 25% of them responded fairly. Moreover, 57% of the total samples were satisfied with their health, where 23% of patients were dissatisfied with their health. The results indicated that, the environmental domain gets the highest score Moreover, the lowest domain was physical with relative weight was 55%.

**Abu-Muammar, (2014)** conduct descriptive, analytical, cross-sectional study to o assess QOL among patients with thalassemia disease in Gaza Strip. Study has been performed on 200 thalassemia patients aged 18 years or more on follow-up at two hematology centers by using Short Form-36 (SF-36). The results showed that study participants had a medium perception level of QOL (mean score was 41.98, SD=19.24). The overall mean percentage for SF-36 domains scores ranged from 24.68% to 53.85%. The general health domain got the highest score with relative weight equaled 53.85%, the social function domain: 51.78%, the physical function domain: 50.62%, the bodily pain domain: 49.90%, the mental health domain: 33.19%, the vitality domain: 32.70%, the emotional role limitation: 31.88% and the lowest domain were physical role limitation with relative weight of 24.68%.

In our current study, we compared the results of local quality of life studies with the results of our study. (Figure 2.2) showed that the Thalassemia patients had a lower score of QOL while better score for Hypertension disease. Moreover, Glaucoma was on medium level compared with other diseases.

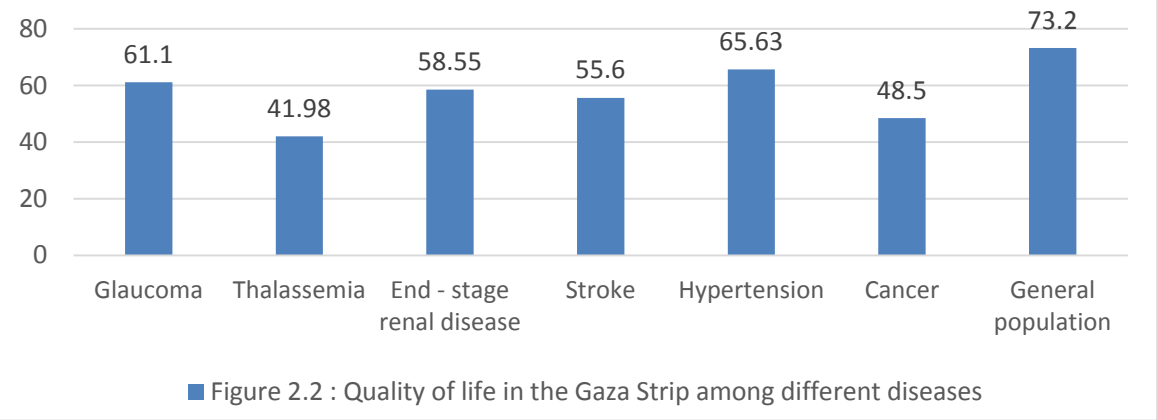



Figure 2.2 : Quality of life in the Gaza Strip among different diseases

**Bayoumi (2014)** conduct a mixed-method approach (triangulated) study to assess the status of wellbeing of GG population, and explore its correlates among people aged 15 to 65. Study has been performed on 627 community members aged 18 years to 65 through administered questionnaire (WHOQOL-100 questionnaire).

Finding reveal that 67.6% of participants were married and 30.6% were working at the time of data collection. Nearly two thirds (64%)of respondents reported that their households 'Income was less than NS 1600 per month. Only, 2.2% of respondents classified themselves as rich, while 27% had considered themselves as poor or very poor, more than half (59.2%)of the surveyed house received aids from various sources. Of the

total respondents, 83.2% perceived themselves as enjoying good health, 17.2% reported having chronic diseases, and 7.8% reported having disability. Although, around 90% of respondents possess health insurance, yet, 43.9% of respondents reported spending more than NIS 50 a month on health care.

Of the total respondents, 22% thought that people around are happier than them. Around one third (35.4%)explicitly declared their support to certain political parties. The majority of respondents (86%)reported that they can share and express their opinions openly in the Front of Family members. But neither al public nor at work places. Security wise, 36.2% of respondents were seriously worried

The overall perceived wellbeing was relatively better than the previous findings of local studies which targeted specific groups of patients. The overall **wellbeing** of the study participant **73.2** (moderate), with a clear variance between spiritual and level of independence aspects which elicited the highest scores (around 80% each) and the environment domain (65%)which scored the least. Alarmingly, 15.6% of respondents reported considering leaving the country as one of their options for the future.

# Chapter (3) Methodology

## 3.1 Study Design

This study is a descriptive, analytical cross-sectional study to assess quality of life among glaucoma patients. The researcher chooses to implement this design because it is the best design to describe the QOL. This type of study is quick, cheap and easy to conduct. It enables the researcher to meet the study objectives in a short time. (Martins et al., 2005).

## 3.2 Study population

In this study, the population is those patients with glaucoma diseases who are registered in Al Nasser Ophthalmic Hospital (NOH) and European Gaza hospital (EGH).

The target population in hospitals is estimated about: (1001-1200) patient**s** in NOH**, (**201-300) patients in EGH, from the unit of statistics in a NOH and EGH hospitals.

## 3.3 Study settings

This study has been conducted at two main centers providing eye care for Glaucoma patients. First, AL Nasser Ophthalmic Hospital and second, European Gaza hospital.

## 3.4 Study Period

The total study period was ten months from May 2016 to February 2017. During this period, a range of activities had been started: title selection, proposal preparation and presentation, data collection, data cleaning, data analysis, and printing.

## 3.5 Eligibility criteria

### 3.5.1 Inclusion criteria

- Patients with glaucoma whose age was 18 years or more.
- Patients agreed to give consent and are able to respond to the questionnaire.

### 3.5.2 Exclusion criteria

- Patients who do not meet the inclusion criteria were excluded from the study**.**
- Presence of cognitive, hearing disability.

## 3.6 Sample of the study

Sample size taken by using the method of convenience sampling, in the way that guarantees the accessibility to the sample member and eligibility of research.

The researcher used Decision Analyst statistical program to calculate the sample size at maximum acceptable percentage points of error 5%. The sample size was (299) of the glaucoma patients at desired confidence level 95%. (Annex 4).

### 3.7 Study Instruments

**3.7.1 The Health Survey Short Form (SF-36):** The Short Form-36 health survey item, was used for this study to assess quality of life. The Short Form-36 survey is a well-recognized, self-administered quality of life scoring system. (Annex 5).

#### 3.7.1.2 Scoring the SF 36-Item

The SF-36 items describing the eight health concepts were transformed into a score of 0-100, and the item's scale averaged to obtain a subscale score. Physical component summary and mental component summaries were computed by averaging the values of the respective subscales. A higher score indicated higher levels of function and better health. Scoring the SF-36 questionnaire is a two-step process. In the first step, preceded numeric values are recoded per the scoring key is given in (Annex 6). All items are scored so that a high score defines a more favorable health state. In addition, each item is scored on a 0 to 100 range so that the lowest and highest possible scores are zero and 100 respectively. Scores represent the percentage of total possible score achieved. In step 2, items in the same scale are averaged together to create the 8 scale scores. Items that are left blank (missing data) are not considered when calculating the scale scores. Hence, scale scores represent the average for all items in the scale that the respondent answered. (Ware, 1993).

The score given to QOL in each domain varies between zero and 100; a score close to zero imply a worse QOL while the one close to 100 shows a better QOL (Brazier et al., 1992). This questionnaire has eight scales. Each scale contains several items to meet the questions of study instrument. (Annex 7) shows the components combined within scales for SF-36.

**3.7.2 Glaucoma Quality of Life-15 Questionnaire:** It is one of the better glaucoma-specific instruments, with good acceptability among clinicians and patients. (Annex 8)

#### 3.7.2.1 Scoring the GQL-15 -Item

Higher GQL-15 scores indicate poorer QOL. The GQL-15 item level responses were coded on a scale of 0 to 5. (5) represented severe difficulty due to visual reasons, (1) indicated no difficulty with performing the activity, and (0) signified abstinence from

activity for nonvisual 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. The subscale score for each domain was calculated using an average of the scores generated in the component item-level responses. 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 to reverse 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 explained the inverse results, in order to be a consensus among the two questionnaires, and also that, the highest value is the best in quality of life.

### 3.8 Scientific rigor and trustworthiness

#### 3.8.1 Reliability:

To ensure reliability, during the pilot study, test-retest was conducted with 5 participants in the first stage piloting by the researcher. Checking and verification the filled questionnaires have been done at the end of data collection, so error identification, correction and prevention were more feasible.

The psychometrics of the questionnaires were tested twice through the statistical analysis software Statistical Package for Social Sciences (SPSS) and indicated high reliability Cronbach's Alpha rating ranging (0.74-0.86) for SF-36 and (0.75-0.87) for GQL-15 Reliability of the collected data of each domain and the total scale are presented below.

**Table 3.1:** Reliability estimates for domain and the entire scale **(SF-36)** and **(GQL-15)**

| SF-36 Scale | Items | Alpha |
|---|---|---|
| Physical functioning | 10 | 0.86 |
| Role functioning/physical | 4 | 0.75 |
| Role functioning/emotional | 3 | 0.79 |
| Energy/fatigue | 4 | 0.81 |
| Emotional well-being | 5 | 0.85 |
| Social functioning | 2 | 0.84 |
| Pain | 2 | 0.78 |
| General health | 5 | 0.74 |

| GOL-15 Scale | Items | Alpha |
|---|---|---|
| Central vision | 2 | 0.87 |
| Glare and dark adaptation | 6 | 0.75 |
| Outdoor mobility | 1 | 0.80 |
| Peripheral vision | 6 | 0.82 |

### 3.8.2 Validity:

The questionnaires (English and Arabic versions) were constructed through adapting previously tested instruments in order to best serve the study objectives. Then the constructed tools were validated through eight expert reviewers who advised regarding internal content validity and appropriateness for statistical analysis to ensure content related validity. The questionnaire was nicely formed to ensure face validity.

### 3.9 Pilot study

A pilot study on 30 patients was done to assess the adequacy of the data collection plan, to explore whether respondents understand the questions, to minimize the problems which may rise during data collection, to identify all domains and components of instrument and to determine the exact time needed to fill the two questionnaires.

### 3.10 Response Rate

According to the eligibility criteria, the researcher selected 299 patients whose age was 18 years or more to participate in the study. A total number of 265 patients agreed and participated, which represented (88.6%) of the study population while 34 patients refused, which represented (11.4%) of the population.

### 3.11 Ethical and administrative considerations

- An academic approval has been obtained from the School of Public Health at Al-Quds University (Annex 9),

- An official latter of approval to conduct the research to be obtained from the Helsinki committee- Gaza strip (Ethical committee). (Annex10)
- An official latter of approval from MOH to collect data from hospitals. (Annex11)
- The researcher assured the respondents that all the findings of the study would be used to guide the service providers and policy makers to improve QOL for Glaucoma patients.
- To guarantee participants rights, a covering letter indicating that the participation is voluntary and confidentiality was assured for all of them.

**3.12 Data collection**

- Data was collected through face-to-face Short Form-36 questionnaire interview, Glaucoma Quality of Life-15 Questionnaire and from patients' files.
- All questionnaire forms were prepared, organized, and classified with serial numbers to ensure the availability of the needed information
- The researcher gave the participant suitable time to answer the questions and encourage them to be open and honest in answering while promising them that information given to the interview has remained confidentiality and just used for the study.
- Great care has taken to ensure privacy and confidentiality.
- The researcher explained the purpose of the questionnaire to the patients before obtaining consent and during the interview, any unclear information was simplified by the researcher to ensure the exact and real answer by the patients.

**3.13 Data analysis:**

- Statistical Package of Social Science (SPSS) program version 20 was used for data entry and analysis.
- Descriptive statistics such as means, medians, cross tabulations were used to show sample characteristics differences.
- Inferential statistics, t-test and ANOVA, were used to find the relationship between QOL dimensions and other independent variables.

**3.14 Limitations of the study**

1-Difficulties in finding cases (time-consuming process)

because we have just 2 days in a week to meet patients in NOH and 1 day in EGH

2-Lack of previous studies, especially QOL studies in Arab countries.

3- Difficulties in collecting of the data from sick or tired patients.

4-Lack of essential information in medical patient files (Visual Field test, Ocular Coherence Topography test) which lead the researcher to exclude the vision variable (visual acuity, visual filed).

In the NOH, Visual field test was available and complete in 26.6%, but not available in 62.0% of files, and recommended but still not recorded in 11.4%. Such a gap in visual field testing documentation is not accepted in a glaucoma management pathway; reflecting a weak diagnosis and monitoring process of glaucoma progression in checked files. She attributed the Gap to unavailability of a visual field analyzer at NOH. In addition, OCT was available and complete in 13.3%, but not available (77.8%), recommended under investigations 8.9%. Even though OCT was available at NOH, but the extended waiting lists in a diagnostic clinic among diabetic retinopathy and glaucomatous patients lead to ignoring it and depending mainly on a direct ophthalmoscope test (Habib, 2016).

# Chapter (4) Results and Discussion

## Introduction

This study has been conducted at NOH and EGH to assess the QOL among patients with Glaucoma disease in GS, using the Short Form-36 (SF-36) questionnaire and Glaucoma quality of life -15 (GQL-15).

This chapter presents the study findings; it shows main findings of the statistical analysis, and the answers to the research questions. Moreover, the study results discussed and argued in the light of the previous studies.

- The first part includes descriptive statistic's findings
- The second part includes inferential statistic's findings

The results could contribute in evaluation and understanding individual's perceptions that receiving glaucoma services at MOH hospitals in GG.

## 4.1 Characteristics of the study participants (n=265)

**Table 4.1: Distribution of the frequency of the demographic and socio-economic and health variables of the study participants, (n=265)**

| **Demographic Data** | **No.** | **%** |
|---|---|---|
| **Sex** | | |
| Male | 147 | 55.5 |
| Female | 118 | 44.5 |
| **Total** | **265** | **100.0** |
| **Age** | | |
| 18 to 30 Years old | 23 | 8.7 |
| 31 to 40 Years old | 27 | 10.2 |
| More than 40 Years old | 215 | 81.1 |
| **Total** | **265** | **100.0** |
| **Education** | | |
| Illiteracy | 29 | 10.9 |
| Primary and Secondary | 91 | 34.3 |
| Tertiary | 99 | 37.4 |
| University | 46 | 17.4 |
| **Total** | **265** | **100.0** |
| **Marital Status** | | |
| Not Married | 30 | 11.3 |
| Married | 235 | 88.7 |
| **Total** | **265** | **100.0** |

| | | |
|---|---|---|
| **Governorates** | | |
| North Gaza | 50 | 18.9 |
| Gaza | 137 | 51.7 |
| Mid zone | 20 | 7.5 |
| Khanunis | 41 | 15.5 |
| Rafah | 17 | 6.4 |
| **Total** | **265** | **100.0** |
| **Place of receiving Services (hospital)** | | |
| NOH | 180 | 67.9 |
| EGH | 85 | 32.1 |
| **Total** | **265** | **100.0** |
| **socio-economic Data** | **No.** | **%** |
| **Working** | | |
| Yes | 70 | 26.4 |
| No | 195 | 73.6 |
| **Total** | **265** | **100.0** |
| **Monthly Income** | | |
| Less than 1000 NIC | 188 | 70.9 |
| From 1000 to 2000 NIC | 54 | 20.4 |
| More than 2000 NIC | 23 | 8.7 |
| **Total** | **265** | **100.0** |
| **Health Profile Data** | **No.** | **%** |
| **Type of Glaucoma** | | |
| OAG (primary & secondary) | 251 | 94.7 |
| CAG (primary & secondary) | 7 | 2.6 |
| Congenital | 7 | 2.6 |
| **Total** | **265** | **100.0** |
| **History of Ocular disease** | | |
| Yes | 103 | 38.9 |
| No | 162 | 61.1 |
| **Total** | **265** | **100.0** |
| **History of chronic diseases** | | |
| Yes | 145 | 54.7 |
| No | 120 | 45.3 |
| **Total** | **265** | **100.0** |
| **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 |
| **Total** | **265** | **100.0** |

| compliance with treatment | | |
|---|---|---|
| Yes | 230 | 86.8 |
| No | 35 | 13.2 |
| **Total** | **265** | **100.0** |

## 4.2 Demographic variables

### 4.2.1 Gender

The study results showed that 55.5% of participant (n=147) were male and 44.5% (n=118) were female. The subjects' gender characteristics are shown in (Figure 4.1).

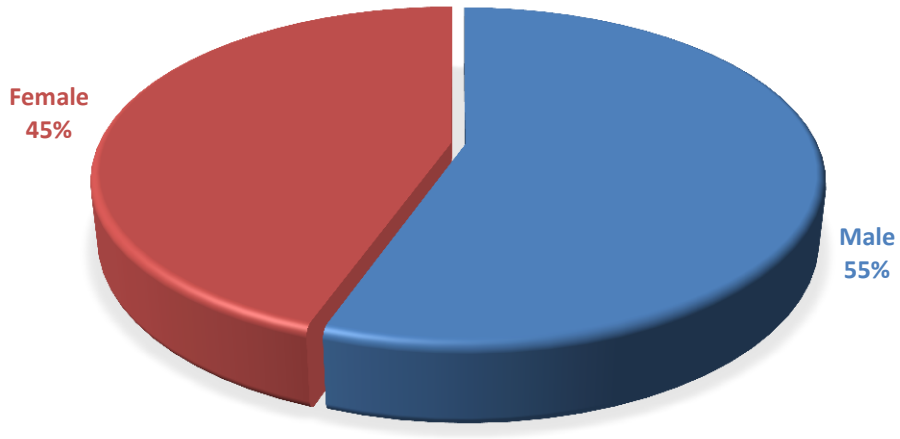



FIGURE (4.1) PERCENTAGE DISTRIBUTION OF RESPONDENTS BY GENDER

### 4.2.2 Age

The age of participants was divided into three categories as following (18-30 years, 31- 40 years, more than 40 years). Figure (4.2) showed the categories of age among participants**.** The maximum percentage was noted among patients aged more than 40 years, which represented (81.1%) while the lowest was noted among patients aged 18-30 years which represented (8.7%).

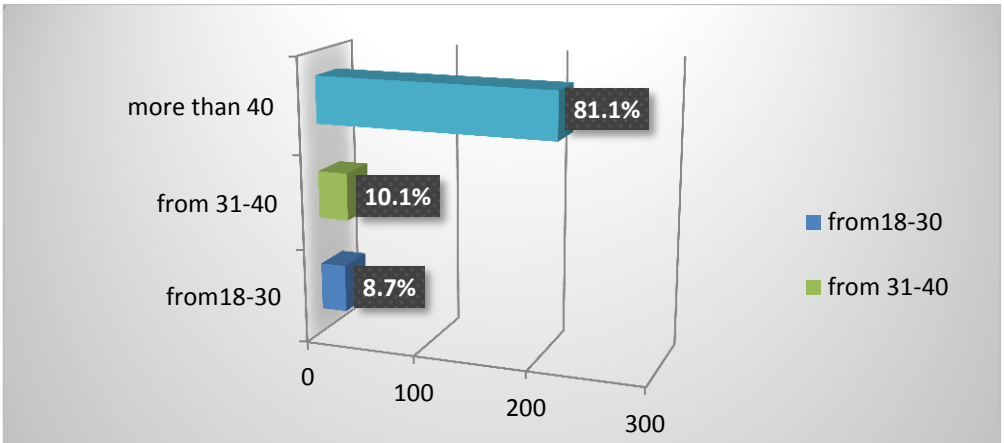



**Figure (4.2) Percentage distribution of respondents by Age**

Here, the researcher explains that the percentage of Glaucoma among the elderly is high compared to younger patients because Older age is strongly related to glaucoma. Both incidence and prevalence increase with age (de Voogd et al. 2005; Leske et al. 2008), and older age is also a risk factor for glaucoma progression (Lichter et al. 2001; Chauhan et al. 2008b).

### 4.2.3 Educational level

As shown in Figure (4.3), most of the participant were at tertiary educational level (37.4%), followed by Primary and Secondary level which represent (34.3%), university and higher educational level represent (17.4%), while illiterate represented only (10.9%).

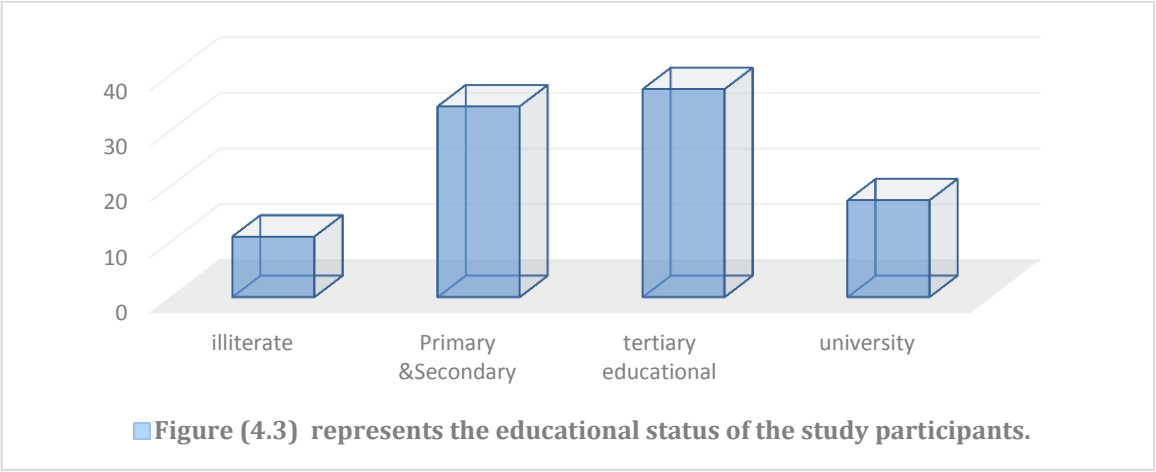



**Figure (4.3) represents the educational status of the study participants.**

### 4.2.4 Marital status

Figure (4.4) represented marital status for glaucoma patients. Most of them 88.7% (N=235) were married, single represent (5.7%), and the others were widowed and divorced (5.7%).

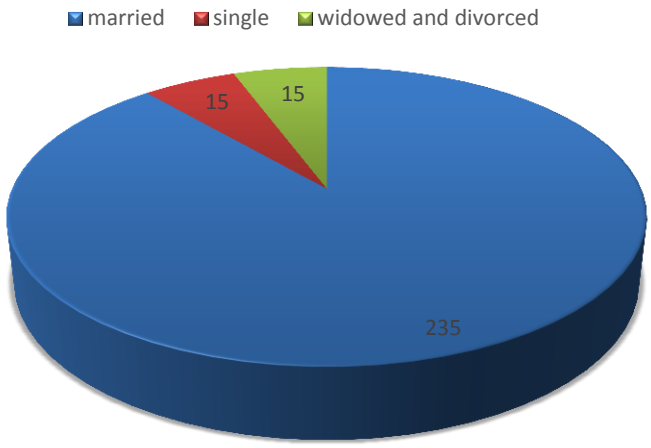



**Figure (4.4) presented marital status for the Glaucoma patients**

### 4.2.5 Distribution according to Governorates

According to "Governorates" the result showed that most of glaucoma patients lived in Gaza city (51.7%), followed by North-Zone (18.9%), Khanunis (15.5%), Mid-Zone (7.5%), and the lowest percentage was lived in Rafah city which represented (6.4%). (Figure 4.5)

NOH hospital is the first main Glaucoma care unit in GS in which (67.9%) of patients with Glaucoma disease are treated. This resulted in presence of the highest number of patients from this hospital in the study. It provides services to patients from North governorate, Gaza governorate and Mid-zone governorate. The EGH is the second main unit, which takes care of (32.1%) of Glaucoma patients. It provides services to patients from Khanunis and Rafah governorates.

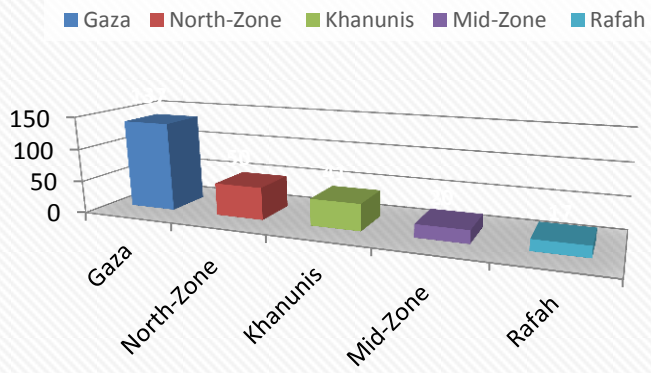



**Figure (4.5) Percentage distribution of Glaucoma patients by governorate**

### 4.3 Socio-demographic Data

#### 4.3.1 Monthly income and Employment

According to the work, the study results represented 73.6% (N=195) of the participant were not working, while (26.4%) of them were working.

The monthly income divided into three main categories: less than 1000 NIS, 1001-2000 NIS, and more than 2001 NIS.

The highest percentage was found in patients with income less 1000 NIS (N=188; 70.9%) who live under poverty level, followed by patients who have income between 1001-2000 NIS (20.4%), and the lowest percentage was found in a patient who has income more than 2001 NIS (8.7%) (Figure 4.6)

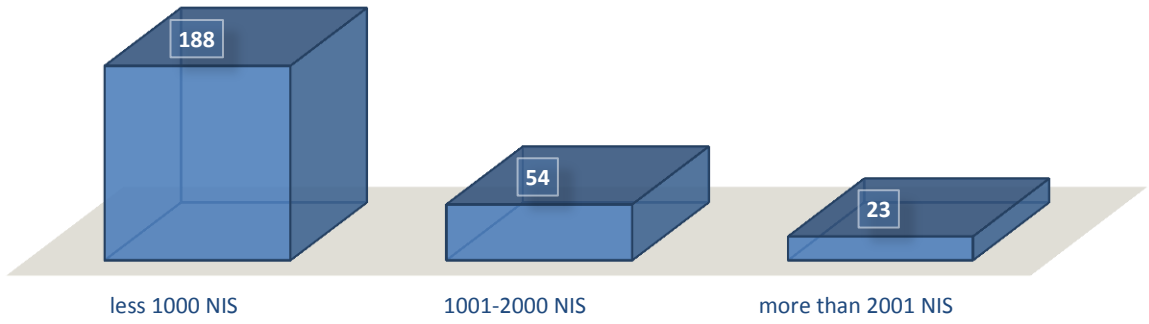



**Figure (4.6) Percentage distribution of Glaucom patients by monthly income**

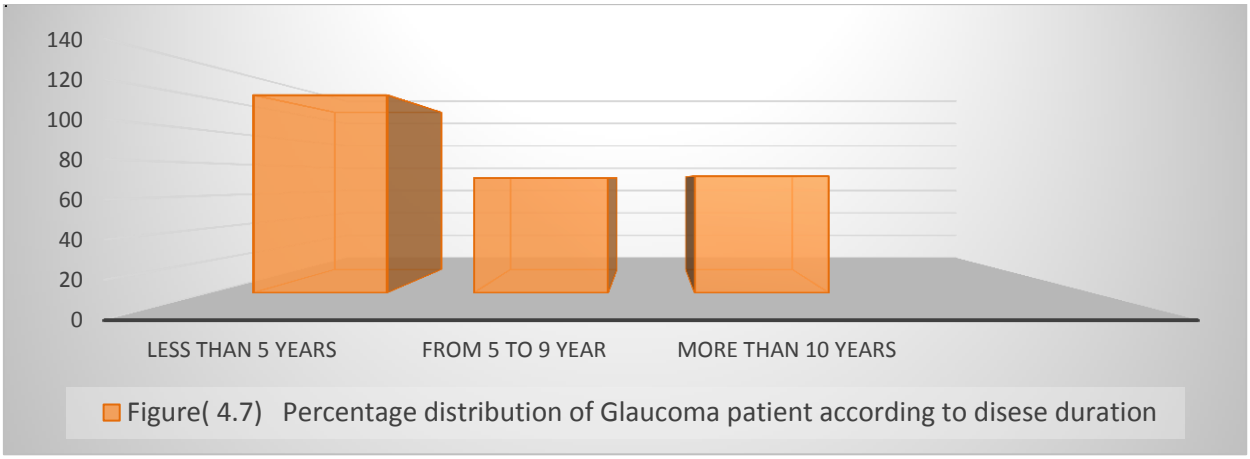
### 4.4 Health profile variables

#### 4.4.1 Type of Glaucoma

According to the type of Glaucoma from a file of the patients, most of the patients were Open Angle Glaucoma (primary and secondary) 94.7% (n= 251), while 2.6% (n=7) Close Angle Glaucoma (primary and secondary), while Congenital Glaucoma represented only (2.6%).

#### 4.4.2 Duration of disease

As illustrated in figure (4.7), 46.0% (N=122) Less than 5 years, (26.8%) From 5 to 9 year, (27.2%) More than 10 years.




Figure( 4.7) Percentage distribution of Glaucoma patient according to disese duration

### 4.4.3 History of ocular disease and chronic disease

According to history of ocular disease, the study result showed that 38.8% (n= 103) of participants had a history of ocular diseases, while 61.1% (n=162) don't have history of ocular diseases, and 54.7% (n=145) of a participant have history of chronic diseases, while (45.3%) don't have history of chronic diseases.

### 4.4.4 Compliance with treatment

According to compliance with treatment, the study result showed that (86.8%) of participant have compliance with treatment ; while (13.2%) not compliance with treatment. Figure (4.8) indicated that most of Glaucoma patient commitment with the treatment.

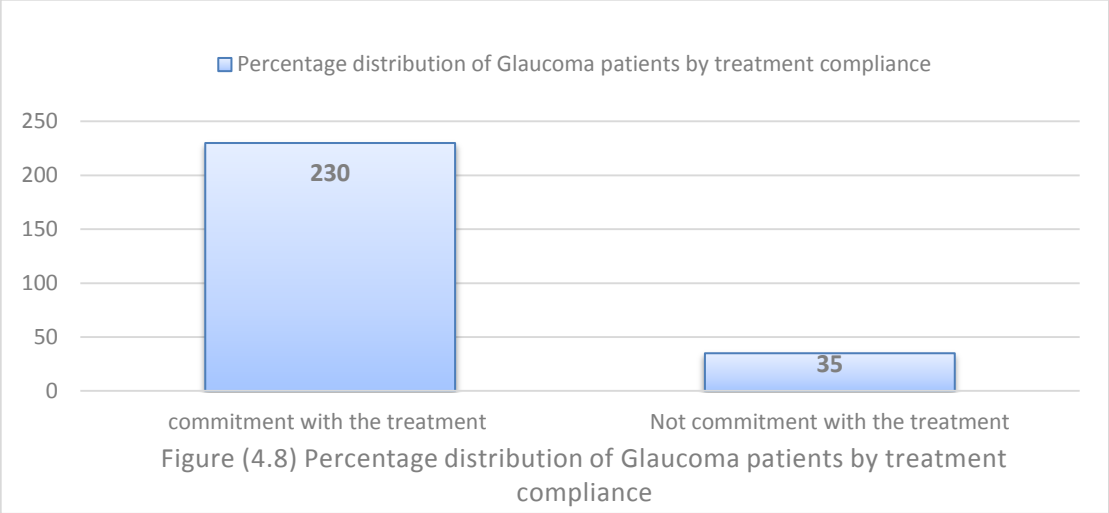



Figure (4.8) Percentage distribution of Glaucoma patients by treatment compliance

### 4.4 Quality of Life Domain (SF-36 Analysis)

QOL consists of eight core domains including 35 items. The last (36th) item is an additional question correlated to changes in health status during the past years. The results of the analysis of SF-36 questionnaire were divided into eight domains. These include: general health, mental health, physical functioning, physical role limitation, emotional role

limitation, bodily pain, vitality and social functioning. The eight domains summary total results are divided into two groups (Mental Component Summary and Physical Component Summary).

The Mental Component Summary (MCS) consists of vitality, social functioning, role limitation due to emotional problems, and mental health. The Physical Component Summary (PCS) consists from physical function, role limitation due to physical health, bodily pain, and general health.

### 4.4.1 Patients' perspectives about their quality of life

**The table (4.2**) shows that the mean score for the SF-36 subscales ranged from (79.4%) for bodily pain to (48.58%) for the general health.

**Table (4.2) Scores obtained in the SF-36 from patients with Glaucoma disease**

| SF-36 Domain | No. of Items | Mean | SD |
|---|---|---|---|
| **Physical Function** | 10 | 70.38 | 23.9 |
| **Role limitation due to physical Health** | 4 | 55.75 | 27.3 |
| **Role limitation due to emotional problems** | 3 | 58.24 | 32.1 |
| **Energy / Fatigue** | 4 | 54.09 | 10.0 |
| **Emotional well being** | 5 | 54.7 | 13.1 |
| **Social Functioning** | 2 | 72.22 | 28.7 |
| **Pain** | 2 | 79.42 | 33.3 |
| **General Health** | 5 | 48.58 | 8.7 |
| **Total SF– 36 domains** | 35 | 61.7 | 13.5 |

The results showed that the lowest domain was general health with a mean of (48.58%) and the best domain score was bodily pain with a mean of (79.42%). The result indicated that glaucoma mainly affected the vitality of patients. Additionally, the results revealed that a mean score of Emotional wellbeing domain was (54.70%).

Moreover, the results showed that the mean of the social function domain was (72.22%) which considered the second-best domain score. The total SF-36 finding showed a mean score of (61.7%) which describe that most of the participant had a medium level of QOL.

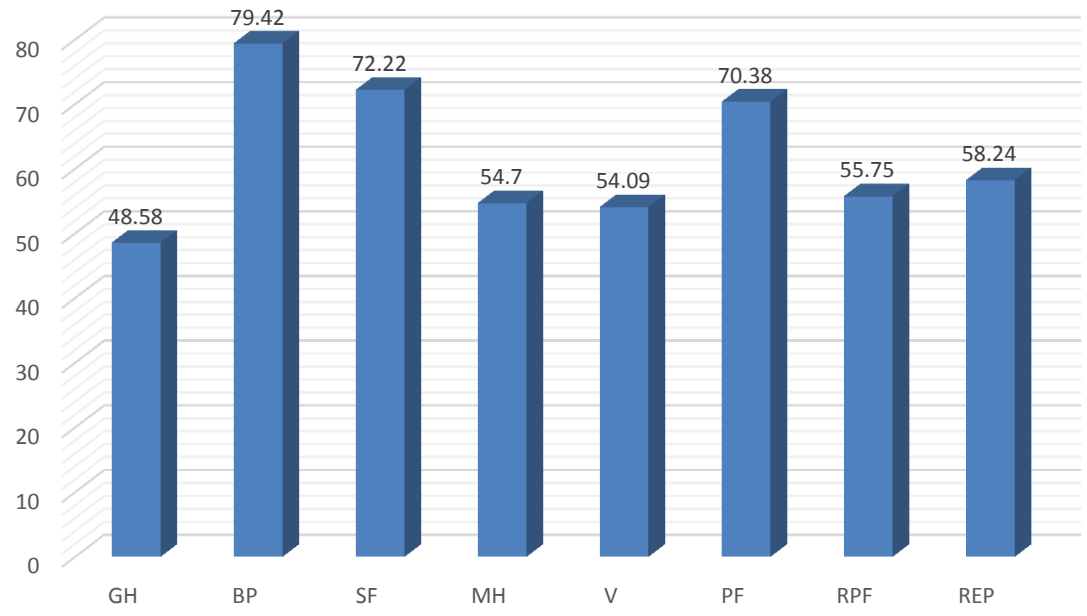



**Figure** (4.9) SF-36 subscales and summary scores of patients with Glaucoma disease

From a systematic review of studies that used the SF-36 survey to evaluate QOL in glaucoma patients, vitality was the most affected domain. General scores in the physical domains (i.e., physical functioning, role limitations-physical, bodily pain, and general health) were lower than those in the psychosocial domains (social functioning, mental health, vitality, and role limitations-emotional).

### 4.4.2 Glaucoma and General health

The perception of Glaucoma patient's general health is assessed in terms of concepts such as excellent, very good, good, fair or poor, and at the same time as healthy as anyone he/she knows, getting ill easier than other people, expect his/her health to get worse. The mean score of general health domain was (48.58%), which concerned the lowest QOL scores.

**Table (4.3) Distribution of responses in reference to general health related item "General Health domain**

| | | Excellent | Very Good | Good | Fair | Poor | Mean percentage |
|---|---|---|---|---|---|---|---|
| **General health** | No. | 0 | 19 | 53 | 165 | 19 | 44.06 |
| | % | (0.0%) | (7.2%) | (20.0%) | (62.3%) | (7.2%) | |
| | | Definitely True | Mostly True | Don't Know | Mostly False | Definitely False | Mean |
| **Get sick easier than the other** | No. | 4 (1.5%) | 66 | 135 | 3 (1.1%) | 57 | 54.06 |
| | % | | (24.9%) | (50.9%) | | (21.5%) | |
| **Healthy as anybody I know** | No. | 19 | 6 (2.3%) | 189 | 49 | 2 | 49.15 |
| | % | (7.2%) | | (71.3%) | (18.5%) | (0.8%) | |
| **Exception health to get worse** | No. | 36 | 127 | 46 | 53 | 3 | 36.79 |
| | % | (13.6%) | (47.9%) | (17.4%) | (20.0%) | (1.1%) | |
| **Health is excellent** | No. | 9 | 141 | 57 | 51 | 7 | 58.87 |
| | % | (3.4%) | (53.2%) | (21.5%) | (19.2%) | (2.6%) | |

Results listed in Table (4.3) indicted that (62.3%) of participants shown good about their general health. Results also indicated that (7.2%) revealed poor and (20.0%) rated their QOL as fair. Furthermore, Results indicated that (10.6%) of the participants revealed very good. Although, glaucoma patients have medium level of general health.

Nevertheless, A significant portion of participant (61.5%) expected poorer health in the future, and around (21.1%) of the participant expected good health in the future.

Wu et al., (2014) who conducted a study Survey on vision-related quality of life and self-management among patients with glaucoma found that the lowest scores were for general health (32.78). Moreover, Nordmann et al., (2003) who conducted a study to assess Vision related quality of life and topical glaucoma treatment side effects use NEI-VFQ-25 global score showed an overall good QOL and two domain scores showed some deterioration in (general health and driving) and found that the mean score general health of domain was (48.25).

Our Findings were consistent with McKean-Cowdin et al., (2008) who conducted a study to assess impact of visual field loss on health-related quality of life in glaucoma that found the mean score of general health of domain was (47.2%), Moreover The lowest mean average values were in "general health" (54.76) in a study to evaluate the vision-related quality of life of glaucoma patients (Orta et al., 2015).

Moreover, Results of our study were consistent with Lin et al., (2010) who conducted a study in Taiwan to assess visual impairment and quality of life, the relationship between visual function and health-related QOL and to identify factors that are significantly impacting QOL for glaucoma patients, that found that the mean score general health of domain was (51.08), In addition, results were inconsistent with Evans et al., (2009) who conducted a study to assess the quality of life impact of peripheral versus central vision loss with a focus on glaucoma versus age-related macular degeneration which found it (69.7).

For local studies of QOL in GGs, result of current study were consistent to (Abu-Muammar, 2014) who conducted a descriptive, analytical cross-sectional study in Gaza governorate to assess the QOL among Thalassemia patients by using Short Form-36 that found that the mean score general health of domain was (53.85).

In addition, Our Finding were inconsistent to (Luzon, 2008) conducted a cross sectional study to examine the QOL and to identify most common factors influencing the QOL in long-term rehabilitated stroke survivors in Gaza governorate, by using Short Form-36, that found that the mean score general health of domain was (77.77).

### 4.4.3 Glaucoma and physical function

The physical domain components are (perform vigorous activities such as running, lifting heavy objects, and perform moderate activities such as moving a table, and climbing several flights of stairs, Bending, kneeling, or stooping, and walking more than a kilometer, Bathing or dressing). The scores on the physical functioning domain scale refer to the level of which the participant's perceptions of their QOL are affected by their physical state. The mean score of physical domain was (70.83%).

**Table (4.4) Distribution of responses in reference to physical function-related item "Physical Function domain"**

| SF-36 Domain | Yes, limited a lot | | Yes, limited a little | | No, not limited | | Mean Percentage |
|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | |
| **Vigorous activities, such as running, lifting heavy objects, or participation in strenuous sports** | 60 | 22.6 | 176 | 66.4 | 29 | 10.9 | 44.15 |
| **Moderate activities, such as moving a table, Vacuuming, bowling or golfing** | 41 | 15.5 | 157 | 59.2 | 67 | 25.3 | 54.91 |
| **Lifting or carrying groceries** | 31 | 11.7 | 105 | 39.6 | 129 | 48.7 | 68.49 |
| **Climbing several flights of stairs** | 31 | 11.7 | 154 | 58.1 | 80 | 30.2 | 59.25 |
| **Climbing one flight of stairs** | 21 | 7.9 | 55 | 20.8 | 189 | 71.3 | 81.7 |
| **Bending, kneeling, or stooping** | 18 | 6.8 | 78 | 29.4 | 169 | 63.8 | 78.49 |
| **Walking more than 1.5 Km** | 19 | 7.2 | 163 | 61.5 | 83 | 31.3 | 62.08 |
| **Walking for 1.5 Km** | 18 | 6.8 | 84 | 31.7 | 163 | 61.5 | 77.36 |
| **Walking for 100 M** | 17 | 6.4 | 50 | 18.9 | 198 | 74.7 | 84.15 |
| **Bathing or dressing yourself** | 8 | 3 | 20 | 7.5 | 237 | 89.4 | 93.21 |
| **Mean Physical Function domain** | | | | | | | 70.38 |

Obviously as finding in Table (4.4), indicated that significant portion of participants (22.6%) reported limited a lot to perform activities that required physical stamina and capacity (Vigorous activities, such as running, lifting heavy objects, or participation in strenuous sports). Furthermore, the highest percentage of the study sample reported limited a little to perform activities that required physical stamina and capacity (moderate activities, lifting or carrying, climbing several flights of stairs, walking for 1.5 km), and the

lowest percentages of the study sample were limited a lot to perform activities that required physical stamina and capacity (Bathing or dressing yourself).

Greater severity of visual field abnormality was associated with significantly greater odds of disability with vision-related function and physical function (Qiu et al., 2014).

Moreover, when walking becomes difficult or is accompanied by fear of falling, patients may restrict their physical activity (Deshpande et al., 2008), producing decreased quality of life (Garatachea et al., 2009).

Cypel et al., (2004) found that Patients with glaucoma had significantly lower scores than healthy control subjects in five domains of the SF-36 (physical functioning, social functioning, role-emotional, mental health, and bodily pain).

Our Finding were consistent to (Lin et al., 2010) that found the mean score of physical Function domain was (74.32%), and similar to (Evans et al., 2009) that found the mean score of physical Function domain was (70.6). Also, the Finding of our study were consistent to (Wändell et al., 1997) who conducted a study to assess the QOL among patients with glaucoma in Sweden that found the mean score of physical Function domain was (75.0%).

On the other side, result of our study inconsistent with (Jain et al. 2015) that's conduct study to assess quality of life of glaucoma patients per WHOQOL-brief found the mean score of physical Function domain was (48.75%), also, results disagreed with (Abu-Muammar, 2014) who conducted a study to assess the QOL among thalassemia patient by using SF-36 questionnaire that found the mean score of physical domain was (50.62) and (Luzon, 2008) who conducted a study to assess the QOL among stroke patient by using SF-36 questionnaire that found it (40.89).

Our result explains that Glaucoma is a disease that affects the eye and does not affect the body completely so the mean of physical function high score compared to other studies.

### 4.4.4 Glaucoma and role limitation due to physical health

The Role limitation due to physical health domain components are (problems with participant performance in work or other regular daily activities because of their physical health). For example, Reduce the length of time they spent on work or other activities,

accomplished less than they would like and Have difficulty performing the work or other activities.

**Table (4.5) Distribution of responses in reference to role limitation1 due to physical health related item "Role Limitation-Physical domain**

| | Yes | | No | | Total | | Mean Percentage |
|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | |
| **Cut down the length of time you spent on work or other activities** | 191 | 72.1 | 74 | 27.9 | 265 | 100.0 | 27.92 |
| **Accomplished less than you would like** | 134 | 50.6 | 131 | 49.4 | 265 | 100.0 | 49.43 |
| **Were limited in the kind of work or other activities** | 74 | 27.9 | 191 | 72.1 | 265 | 100.0 | 72.08 |
| **Had difficulty performing the work or other activities** | 70 | 26.4 | 195 | 73.6 | 265 | 100.0 | 73.58 |
| **Mean of Role limitation due to physical health** | | | | | | | 55.75 |

Obviously as finding in Table (4.4), indicated that (72.1%) had reported limited role due to their physical health, this limited was for (Reduce the length of time they spent on work or other activities). Only (26.4%) reported that they had difficulties in performing the work or other activities.

That means the higher percentage of the study sample have good physical health functioning that enables them to perform these activities like work or other daily activities without any problem. The mean score of role limitation due to the physical health domain was (55.75%).

Our findings were consistent to Lin et al., (2010) that found the mean score of role limitation due to physical health domain was (57.79), Also, the Finding of our study were consistent to Wändell et al., (1997) that found the mean score of Role limitation due to physical health domain was (49.5%), and inconsistent Evans et al., (2009) that found that the mean score of role limitation due to physical health domain was (66.4).

Our results disagreed as well, with (Abu-Muammar, 2014) who conducted a study to assess the QOL among thalassemia patient by using SF-36 questionnaire that found the mean score of role limitation due to physical health domain was (24.68) and (Luzon, 2008) who conducted a study to assess the QOL among stroke patient by using SF-36 questionnaire that found it (28.05).

### 4.4.5 Glaucoma and role limitation due to emotional problems

The Role limitation due to emotional problems domain components are (problems with participant performance in work or other regular daily activities because of their emotional problems). For example, Reduce the length of time they spent on work or other activities, accomplished less than they would like and Didn't do work or other activities as carefully as usual.

**Table (4.6) Distribution of responses in reference to role limitation due to emotional problem related item "Role Limitation-Emotional domain**

| | **Yes** | | **No** | | **Total** | | **Mean Percentage** |
|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | |
| **Cut down the length of time you spent on work or other activities** | 174 | 65.7 | 91 | 34.3 | 265 | 100.0 | 34.34 |
| **Accomplished less than you would like** | 93 | 35.1 | 172 | 64.9 | 265 | 100.0 | 64.91 |
| **Didn't do work or other activities as carefully as usual** | 65 | 24.5 | 200 | 75.5 | 265 | 100.0 | 75.47 |
| **Mean of Role limitation due to Emotional problems** | | | | | | | 58.24 |

As shown in Table (4.6) A great portion of participant (65.7%) reported limited role due to their emotional problems, this limited was for (Reduce the length of time they spent on work or other activities). On the other hand, (24.5%) reported that they Didn't do work or other activities as carefully as usual. That mean they had problems with work or other daily living activities because of emotional problems that directed to role limitation. The mean score of role limitation due to emotional problems domain was (58.24%).

Cypel et al., (2004) found that Patients with glaucoma had significantly lower scores than healthy control subjects in five domains of the SF-36 (physical functioning, social functioning, role-emotional, mental health, and bodily pain).

Our Finding were consistent to Wändell et al., (1997) that found the mean score of Role limitation due to Emotional problems domain was (57.3%).

Also, our results were consistent to Lin et al., (2010) that found the mean score of role limitation due to Emotional problems domain was (64.08), and inconsistent with Evans et al., (2009) that found the mean score of role limitation due to Emotional problems domain was (69.80).

Our study explained why the low mean of Role limitation due to Emotional problems, this could be due to the expect the glaucoma diagnosis and its consequences on visual function to affect a patient emotionally.

Our findings were inconsistent with (Abu-Muammar, 2014) who conducted a study to assess the QOL among thalassemia patient by using SF-36 questionnaire that found the mean score of role limitation due to Emotional problems domain was (31.88) and (Luzon, 2008) who conducted a study to assess the QOL among stroke patient by using SF-36 questionnaire that found it (42.97).

### 4.4.6 Glaucoma and vitality

The vitality domain components are (what extent the participants are feeling active and full of pep, or worn out and tired). The mean score of **vitality** domain was (54.09%), which concerned the second lowest QOL score.

**Table (4.7) Distribution of responses in reference to vitality related item "Vitality domain**

| | | All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time | Mean Percentage |
|---|---|---|---|---|---|---|---|---|
| **Feel full of life** | No. | 17 | 32 | 74 | 59 | 68 | 15 | 53.13 |
| | % | (6.4%) | (12.1%) | (27.9%) | (22.3%) | (25.7%) | (5.7%) | |
| **Have a lot of energy** | No. | 2 | 57 | 62 | 47 | 89 | 5 | 53.06 |
| | % | (1.9%) | (21.5%) | (23.4%) | (17.7%) | (33.6%) | (1.9%) | |
| **Feel worn out** | No. | 5 | 57 | 62 | 47 | 89 | 5 | 56.6 |
| | % | (1.9%) | (21.5%) | (23.4%) | (17.7%) | (33.6%) | (1.9%) | |
| **Feel tired** | No. | 12 | 71 | 56 | 26 | 51 | 49 | 53.58 |
| | % | (4.5%) | (26.8%) | (21.1%) | (9.8%) | (19.2%) | (18.5%) | |
| **Mean of Energy/ Fatigue** | | | | | | | | 54.09 |

Results listed in Table (4.7) indicated that (6.4%) of the participant reported that they felt full of life all the time, (23.4%) have a lot of energy at a bit of the time.

On the other hand, (33.6%) of participant reported that they felt worn out a little of the time and (26.8%) felt tired most of time.

From a systematic review of studies that used the SF-36 survey to evaluate QOL in glaucoma patients, reported that vitality was the most affected domain.

Our findings were similar to Lin et al., (2010) that found the mean score vitality domain was (54.71), and consistent with Evans et al., (2009) that found the mean score of vitality domain was (57.8).

Moreover, Results of our study were inconsistent with (Abu-Muammar, 2014) who conducted a study to assess the QOL among thalassemia patient by using SF-36 questionnaire that found the mean score of vitality domain was (32.70) and Disagree with (Luzon, 2008) who conducted a study to assess the QOL among stroke patient by using SF-36 questionnaire that found the mean score of vitality domain was (71.6).

Our study clarifies the low score of vitality (energy) among glaucoma patients because most of the glaucoma patient in the sample above the 40 years (elderly) and usually

decreases activity of individuals in this stage and the weakness of the vital functions of the body.

### 4.4.7 Glaucoma and Mental Health (Emotional wellbeing)

The Mental Health domain components are (what extent of the participants are feeling nervous, downhearted and blue and feeling calm and peaceful also a happy person). The mean score of Mental Health domain was (54.70%), which concerned the third lowest QOL score.

**Table (4.8) Distribution of responses in reference to mental health related item "Mental Health domain**

| | | All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time | Mean Percentage |
|---|---|---|---|---|---|---|---|---|
| **Have been a very nervous person** | No. | 15 | 94 | 64 | 15 | 26 | 51 | 47.25 |
| | % | (5.7%) | (35.5%) | (24.2%) | (5.7%) | (9.8%) | (19.2%) | |
| **Have felt so down in the dumps that nothing could cheer you up** | No. | 8 | 89 | 40 | 23 | 29 | 76 | 55.4 |
| | % | (3.0%) | (33.6%) | (15.1%) | (8.7%) | (10.9%) | (28.7%) | |
| **Have felt calm and peaceful** | No. | 1 | 21 | 98 | 54 | 84 | 7 | 56.6 |
| | % | (0.4%) | (7.9%) | (37.0%) | (20.4%) | (31.7%) | (2.6%) | |
| **Have felt downhearted and blue** | No. | 7 | 79 | 47 | 19 | 40 | 73 | 56.98 |
| | % | (2.6%) | (29.8%) | (17.7%) | (7.2%) | (15.1%) | (27.5%) | |
| **Have you been a happy person** | No. | 1 | 47 | 62 | 53 | 81 | 21 | 57.28 |
| | % | (0.4%) | (17.7%) | (23.4%) | (20.0%) | (30.6%) | (7.9%) | |
| **Mean of Emotional Well being** | | | | | | | | **54.70** |

Results listed in Table (4.8) indicated that (35.5%) of the participant reported felt nervous, (29.8%) felt downhearted and blue. Results also indicated that (33.6%) felt so down in the dump that nothing could cheer you up most of the time.

Nevertheless, a significant portion of participant (23.4%) reported that they felt happy and (37.0%) reported clam in a good bit of the time.

Our study noted that some people with glaucoma feel happy and adapted with the disease, this is due to the belief that is predestined from Allah and they're so full of satisfaction.

Patients with glaucoma have lower scores in functional status and Emotional Wellbeing, than patients without glaucoma as tested by the SF-36 questionnaire (Wilson et al., 1998).

The level of understanding about glaucoma is an independent factor negatively associated with psychological disturbance and positively associated with QOL in patients with glaucoma. On the other hand, it is a subjective factor which can be controlled, so informing knowledge about glaucoma and establishing appropriate habits might help patients alleviate psychological disturbance and enhance their QOL. (Kong et al., 2014). More than 80% reported negative emotions on learning that they had glaucoma, one-third were afraid of going blind. (**Odberg** *et al.* 2001).

The prevalence of anxiety and depression in patients with POAG was assessed on a case–control study conducted by Mabuchi et al., (2008), using the Hospital Anxiety and Depression Scale (HADS) questionnaire found that the prevalence of patients with anxiety (13.0%) and depression (10.9%) was significantly higher than in the control group.

Moreover, Glaucoma Anxiety group in QOL study the answer were: 54% worried about their intraocular pressure, 58% think about a surgical intervention, 66% have insomnia, 74% are concerning about blinding (Bogdanici *et al.* 2010).

**Jung** *et al.* (2016) conduct study to assess Mental Health Status and Quality of Life in Undiagnosed Glaucoma Patients reported that symptoms of "some or severe problems" in all 5 dimensions of the EuroQoL-5 instrument, including anxiety/depression, was higher in the glaucoma group than in the nonglaucoma group.

**Also,** Glaucoma negatively affects psychosocial functioning. 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. Ophthalmologists and glaucoma patients need to be aware that both Visual acuity and visual filed losses at different stages of glaucoma negatively impact psychosocial functioning. **(Chan** *et al. 2015*)

Our findings were consistent to (Lin et al., 2010) that found the mean score of Emotional Wellbeing domain was (65.32), and inconsistent with (Evans et al., 2009) that found the mean score of Emotional Wellbeing domain was (72.9).

Moreover, result of our study consistent with (Jain et al. 2015) that's conduct study to assess quality of life of glaucoma patients per WHOQOL found the mean score of psychological domain was (49.70%).

Our results were inconsistent with (Abu-Muammar, 2014) who conducted a study to assess the QOL among thalassemia patient by using SF-36 questionnaire that found the mean score of Emotional Wellbeing domain was (33.19) and (Luzon, 2008) who conducted a study to assess the QOL among stroke patient by using SF-36 questionnaire that found it (81.28).

Tastan *et al.* (2010) reported that the incidence of depression and anxiety increased with decreasing quality of life scores. Quality of life was associated negatively with anxiety and depression in patients with glaucoma. However, the QOL indices were notably reduced in glaucomatous patients without visual field defects, which was due to a changed psychological status. (Illarionova *et al.* 2002).

Our study explained the low QOL in mental health domain (Emotional Wellbeing) among Glaucoma patients due to the fearing of the blindness that's what makes them nervous, worried, frustrated most of the time.

### 4.4.8 Glaucoma and social functioning

The social functioning domain components are (social activities and interaction with others, such as family members, friends, neighbors and other social relations.). The mean score of social functioning domain was (77.22%).

**Table (4.9) Distribution of responses in reference to social function related item "Social Function domain**

| | | Not at all | l Slightly | Moderately | Quite a bit | Extremely | Mean Percentage |
|---|---|---|---|---|---|---|---|
| **Physical health or emotional problems interfered with your normal social activities with family, friends, neighbors or groups** | No. | 120 | 30 | 86 | 16 | 13 | 71.5 |
| | % | (45.3%) | (11.3%) | (32.5%) | (6.0%) | (4.9%) | |
| | | All of time | Most of time | Some of time | A little of Time | None of Time | Mean |
| **Physical health or emotional problems interfered with your social activities (like visiting friends, relatives)** | No. | 11 | 12 | 96 | 15 | 131 | 72.9 |
| | % | (4.2%) | (4.5%) | (36.2%) | (5.7%) | (49.4%) | |
| **Mean of Social Function domain** | | | | | | | 77.22 |

Regarding the social function, data suggest that (49.4%) of the participants as a show in the Table (4.9), reported that they didn't have any interfered with social activity. Only (9.1%) of the participants reported that they have interfered with social activity. It's not surprising for this domain to elicit high score. A possible explanation for the high QOL in social function among Glaucoma patients due to that the Palestinian people, have close social inter-relationship between them and family, friends, neighbors or groups, and visiting friends and relatives.

Visually impaired people are at higher risk than the healthy population for accidents, social isolation, and depression (McGwin *et al.*2005; Ribeiro et al., 2015). A strong correlation between decreasing visual acuity, visual filed and QOL scores with greatest impact on social and mobility-related activities (Tran HM *et al.* 2011).

Our Finding were consistent to (Wändell et al., 1997) that found the mean score of Social Function domain was (86.8%). Nordmann et al., (2003) who conducted a study to assess

Vision related quality of life and topical glaucoma treatment side effects using NEI-VFQ-25 global score found that the mean score general health of domain was (85.5).

Results of our study were consistent to (Evans et al., 2009) that found the mean score of Social Function domain was (80.9), and like with (Lin et al., 2010) that found the mean score of Social Function was (78.64). In contrast, result inconsistent with Jain et al. (2015) who conduct study to assess quality of life of glaucoma patients per WHOQOL-brief found the mean score of Social Function was (47.41%).

For local studies, Results of our study were inconsistent with (Abu-Muammar, 2014) who conducted a study to assess the QOL among thalassemia patient by using SF-36 questionnaire that found the mean score of Social Function domain was (51.78) and Results were consistent to (Luzon, 2008) who conducted a study to assess the QOL among stroke patient by using SF-36 questionnaire that found it (71.39).

### 4.4.9 Glaucoma and bodily pain

The bodily pain domain components are (what extent the participant's experience of bodily pain reduces their performance of daily activities, involving work-related duties in the public environment and tasks within the home). The mean score of bodily pain domain was (79.42%), which concerned the best QOL score.

**Table (4.10) Distribution of responses in reference to bodily pain related item "Bodily Pain domain**

| | | **None** | **Very Limit** | **Mild** | **Moderately** | **Sever** | **Very Sever** | **Mean Percentage** |
|---|---|---|---|---|---|---|---|---|
| **How much physical pain have you had during the past 4 weeks?** | No. | 178 | 15 | 5 | 36 | 15 | 16 | 79.40 |
| | % | (67.2%) | (5.7%) | (1.9%) | (13.6%) | (5.7%) | (6.0%) | |
| | | Not at all | l Slightly | Moderately | Quite a bit | Extremely | | **Mean** |
| **How much did pain interfere with your normal work?** | No. | 186 | 12 | 11 | 40 | 16 | | 79.43 |
| | % | (70.2%) | (4.5%) | (4.2%) | (15.1%) | (6.0%) | | |
| **Mean of Bodily Pain domain** | | | | | | | | **79.42** |

Results listed in Table (4.10) indicated that (67.2%) of the participant reported that they don't have bodily pain and (70.2%)of them were no contradiction between physical pain and perform works both inside and outside the home.

On the other hand, the same data indicated that (6%) of participant reported that they have extremely body pain.

Our findings were consistent to Lin et al., (2010) that found the mean score of bodily pain domain was (73.04), and inconsistent with Evans et al., (2009) that found the mean score of bodily pain domain was (72.7). Also, our Finding were consistent to Wändell et al., (1997) that found the mean score of bodily pain domain was (71.2%)

For local studies, Results of our study were inconsistent with (Abu-Muammar, 2014) who conducted a study to assess the QOL among thalassemia patient by using SF-36 questionnaire that found the mean score of bodily pain domain was (49.90) and the results were consistent with (Luzon, 2008) who conducted a study to assess the QOL among stroke patient by using SF-36 questionnaire that found it (76.24).

### 4.4.10 Health compared to one year earlier

**Table (4.11) Distribution of responses in reference to health compared to one year earlier**

| | | Much better now | Some what better now | About the same | Some what worse now | Much worse now | Total |
|---|---|---|---|---|---|---|---|
| **Health compared to one year earlier** | No. | 4 | 26 | 107 | 118 | 10 | 265 |
| | % | (1.5%) | (9.8%) | (40.4%) | (44.5%) | (3.8%) | (100.0%) |

As show in the Table (4.11) the patients assessment of their health in comparison to one year earlier. About half of the study sample (44.5%) evaluated personal health as worse compared to one year earlier.

Our study explains the high worse in the health than the previous year due to the disease is progressive over time and the lack of follow-up, adherence to treatment also health problems that associated with elderly, which worsens the QOL level.

### 4.5 Quality of Life Domain (Glaucoma Quality of Life-15 Questionnaire)

QOL consists of four core domains, including 15 items. The results from the analysis of the GQL-15 questionnaire were divided into four domains. These include: central vision, peripheral vision, outdoor mobility, Glare and dark adaptation.

**The Table (4.12)** shows that the mean score for the GQL-15 subscales ranged from (66.6%) for Outdoor mobility to (48.5%) for Glare and dark adaptation.

**Table (4.12) Scores obtained in the GQL-15 from patients Glaucoma disease (n=265)**

| GQL-15 Domains | No. of Items | Mean | SD |
|---|---|---|---|
| **Central vision** | **2** | **57.3** | **19.1** |
| **Peripheral vision** | **6** | **61.4** | **19.4** |
| **Outdoor mobility** | **1** | **66.6** | **25.4** |
| **Glare and dark adaptation** | **6** | **48.5** | **18.0** |
| **Total GQL-15 domains** | **15** | **59.2** | **17.6** |

The results showed that the highest domain was outdoor mobility with a mean of (66.6%), and the lowest domain score was Glare and dark adaptation with a mean of (48.5%). The researcher found that glaucoma mainly affected the central vision of patients. Additionally, the results revealed that a mean score of Peripheral vision domain was (61.4%).

The summary score was 59.2 (SD ± 17.6) in glaucoma patients and Subscale score showed that dark adaptation and glare was problematic to majority in assessing Quality of Life in patients with Glaucoma using the Glaucoma Quality of Life-15 questionnaire in Indian eyes (Naveen et al. 2014). And this consistent with our study results. Onakoya et al. (2012) conduct study to Assessing Quality of life of primary open angle glaucoma patients in Nigeria, reported that, the mean score was 75.93 (SD ± 12.4).

Moreover, Zhou *et al.,* (2014) conduct a study to assessing Quality of life of glaucoma patients in China: sociodemographic, clinical, and psychological correlates, a cross-sectional study using the Glaucoma Quality of Life-15 (GQL-15) questionnaire reported that, the mean score was 71.21(SD ± 12.74).

Also, Goldberg et al (2009) conduct a study to Assessing quality of life in patients with glaucoma in Australia using the Glaucoma Quality of Life-15 (GQL-15) questionnaire reported that reported that, the mean score was 69.5(SD ± 13.7).

- In our study, tasks involving Glare and dark adaptation are most affected in POAG patients
- Goldberg et al (2009), Onakoya et al (2012) and Naveen et al. (2014) also reported glare and dark adaptation to be most affected in glaucoma patients

Palestinian glaucoma patients had a moderate VRQOL level when compared to the results from other countries.

Potential explanations for these differences may lie in several aspects. First, the sample sizes differed greatly (China, 508; Nigeria, 132; Australia, 121), however, a small sample size may not capture the full variety of glaucoma patients and cause a deviation.

Moreover, The Nigerian study included patients with POAG at least 40 years old and the Australian patients were also with POAG but at least 44 years old. Our study covered the same varieties of glaucoma, but with a more evenly distributed sample size of each glaucoma type and a broader age above 18 years. The divergences of these researched may result from the cultural and social variances, different QOL assessing instruments, and varied independent variables included in the studies.

### 4.5.1 Effect of Glaucoma on central vision

This dimension assesses the extent to which the central vision of the participant, e.g. Newspaper reading, recognizing faces were affected by glaucoma. The mean score of central vision domain was (57.27%).

**Table (4.13) Distribution of responses in reference to Central Vision**

| | | None Difficulty | Mild Difficulty | Moderately Difficulty | Sever Difficulty | Very Sever Difficulty | Mean **Percentage** |
|---|---|---|---|---|---|---|---|
| **Newspaper reading** | No. | 16 | 42 | 122 | 59 | 5 | **50.51** |
| | % | (6.6%) | (17.2%) | (50.0%) | (24.2%) | (2.0%) | |
| **Recognizing faces** | No. | 41 | 85 | 111 | 26 | 2 | **62.92** |
| | % | (15.5%) | (32.1%) | (41.9%) | (9.8%) | (0.8%) | |
| **Mean of Central Vision** | | | | | | | **57.27** |

Results listed in Table (4.10) indicated that (50%) of the participant reported that they had moderately difficulty in reading, while (41.9%) had the same degree of difficulty in Recognizing faces. On the other hand, (15.5%) of the participant reported no difficulty in recognizing faces. Only (6.6%) reported no difficulty in Newspaper reading.

Difficulty with central and near vision tasks in general, and with reading specifically, are the most frequent complaint among subjects with eye disease. Near vision tasks such as reading are also the most valued visual function among a patient with glaucoma (**Burr** *et al.* 2007). Central VF and visual acuity are generally spared until the disease is more advanced. Patients with binocular VF loss have serious difficulties in activities of daily life such as reading, mobility, or driving (Friedman et al. 2007)**.**

In the SEE study, patients with bilateral Glaucoma were almost 5 times more likely to report severe difficulty with near activities than patients without Glaucoma (Freeman *et al.* 2008). Difficulties with central and near vision tasks in general, and with reading specifically, are the most common complaint among people with eye disease. Near vision tasks for example, readings are also the most valued visual function in those with glaucoma. While reading is clearly dependent on visual acuity, complaints of difficulty reading are commonplace and were noted in over 40% of the glaucoma patients (Ramulu *et al.* 2009).

Bogdanici *et al.* (2010) who conduct a study to assess Quality of life in glaucoma patients, and Glaucoma patients divided into three groups and found the second group: 68% can't read a small letter, 70% can't recognize the people and varied things afoot, 66% need more time to do simple tasks, 76% can't manage in an unfamiliar environment, 36% fill that they find more help among people.

Our study explains this decline because of that most of the study sample over 40 years and therefore, most of them have presbyopia with affected on the reading and in addition many of them have other ocular diseases and refractive errors with affected on the reading and Recognizing faces. Other possible explains: Palestinian people do not have a reading culture and for that, reason may not accurately respond to QOL questions regarding difficulties encountered when reading newspapers, books.

### 4.5.2 Effect of Glaucoma on Peripheral vision

This dimension attribute to the extent to which the Peripheral vision of the participant, e.g. Tripping over the object, seeing objects come from the side, walking in steps/ stairs and Bumping into objects were affected by glaucoma.

**Table (4.14) Distribution of responses in reference to peripheral vision**

| | | None Difficulty | Mild Difficulty | Moderately Difficulty | Sever Difficulty | Very Sever Difficulty | Mean Percentage |
|---|---|---|---|---|---|---|---|
| **Walking in uneven ground** | No. | 37 | 119 | 96 | 9 | 4 | **66.6** |
| | % | (14.0%) | (44.9%) | (36.2%) | (3.4%) | (1.5%) | |
| **Tripping over object** | No. | 32 | 41 | 131 | 52 | 9 | **53.3** |
| | % | (12.1%) | (15.5%) | (49.4%) | (19.6%) | (3.4%) | |
| **Seeing objects come from the side** | No. | 36 | 57 | 147 | 23 | 2 | **59.62** |
| | % | (13.6%) | (21.5%) | (55.5%) | (8.7%) | (0.8%) | |
| **Walking in steps/ stairs** | No. | 68 | 103 | 79 | 11 | 4 | **70.72** |
| | % | (25.7%) | (38.9%) | (29.8%) | (4.2%) | (1.5%) | |
| **Bumping into objects** | No. | 33 | 44 | 132 | 49 | 7 | **54.43** |
| | % | (12.5%) | (16.6%) | (49.8%) | (18.5%) | (2.6%) | |
| **Judging distance of foot to step / curb** | No. | 45 | 73 | 133 | 13 | 1 | **63.96** |
| | % | (17.0%) | (27.5%) | (50.2) | (4.9%) | (0.4%) | |
| **Mean of peripheral vision** | | | | | | | **61.45** |

As shown in Table (4.14), Roughly a bit higher than half of participants reported that they had moderately difficulty in seeing objects come from the side, while (49.4%,49.8) had the same degree of difficulty in tripping over object and bumping into objects. Moreover (4.2%) had severe difficulty in walking in steps/ stairs.

In contrast, a significant portion of participant (25%) reported no difficulty in walking in steps/ stairs. Also, approximately (12%) reported no difficulty with tripping over object and bumping into objects. The mean score of Peripheral vision domain was (61.45%).

Glaucoma and AMD patients with similar visual acuity experienced similar overall impairment in QOL. However, glaucoma patients described more difficulty with peripheral vision and ocular pain, whereas AMD patients complained more about near and distance vision and dependency items (Ugurlu *et al.*, 2016).

Nelson *et al.,* (1999) conducted a study about Patients' perception of visual impairment in glaucoma reported that glaucoma patients also had problems with vision in activities demanding functional peripheral vision. Bilateral VF loss resulting from glaucoma is associated with greater fear of falling (Ramulu *et al.*, 2012).

Restriction of travel outside the home in individuals with glaucomatous VF loss is consistent with prior research demonstrating a broad range of mobility deficits in individuals with VF loss, including worse balance, more bumping into objects, driving restriction, falls, fear of falling, decreased physical activity and greater self-reported mobility difficulty. (Nguyen *et al.*, 2015; Labiris *et al.*, 2010; Aspinall *et al.*, 2008).

It is exciting to note that peripheral vision which is the first area of the visual field affected in glaucoma was not the worst score.

Viswanathan *et al.*, (1999) demonstrated that two of the strongest correlates with binocular VF loss were difficulty with stairs and bumping into objects, these abilities appear to be linearly and progressively affected in the progression of the disease, influencing QOL more in advanced stages. This consistent with several studies (Mangione *et al.*, 2001; Labiris *et al.*, 2010; Wu *et al.*, 2008).

Our study explains this decline because of the visual filed affected by glaucoma and therefore, the patient does not see things around them and from the side clearly, so a lot of them bumping objects and Tripping over the object.

### 4.5.3 Effect of Glaucoma on Outdoor mobility

This dimension points to the extent to which the Outdoor mobility of the participant, e.g. Crossing the road was affected by glaucoma. The mean score of outdoor mobility domain was (66.60%).

**Table (4.15) Distribution of responses in reference to Outdoor mobility**

| | | None Difficulty | Mild Difficulty | Moderately Difficulty | Sever Difficulty | Very Sever Difficulty | Mean Percentage |
|---|---|---|---|---|---|---|---|
| **Crossing the road** | No. | 67 | 77 | 91 | 25 | 5 | **66.60** |
| | % | (25.3%) | (29.1%) | (34.3%) | (9.4%) | (1.9%) | |
| **Mean of Outdoor Morbidity** | | | | | | | **66.60** |

As shown in Table (4.15), A significant portion of participants (34.3%) reported moderate difficulty in crossing the road, while (9.4%) reported severe difficulty in crossing the road. In contrast, (25.3%) reported that they don't have any difficulty in crossing the road.
Current study explained that due to the level of visual impairment in the mild glaucoma had not started to affect their ability to function as outdoors.

Difficulty with walking was the most common complaint for glaucoma patients after difficulty with lighting, 49% describing difficulties with steps, 42% describing difficulty going shopping, and 36% describing difficulty crossing the road (Nelson *et al.*, 1999).

Bilateral vision impairment in this population was associated with substantial decrements in mobility and independence, with glaucoma and cataract independently associated with worse mobility and independence. (Fenwick *et al.* 2016).

Our study explains this due to the affected visual filed resulting from glaucoma, which restricts the movement of the patient and makes them find it very difficult to cut the road. Tran HM *et al.* (2011) reported a strong correlation between decreasing visual acuity, visual filed and QOL scores with the greatest impact on social and mobility-related activities.

### 4.5.4 Effect of Glaucoma on Glare and dark adaptation

This dimension points about the extent to which the Glare and dark adaptation of the participant, e.g. walking after dark, seeing at night, adjusting to bright lights and findings dropped objects were affected by glaucoma. The mean score of glare and dark adaptation domain was (48.47%), which concerned the lowest QOL score.

**Table (4.16) Distribution of responses in reference to Glare and dark adaptation**

| | | None Difficulty | Mild Difficulty | Moderately Difficulty | Sever Difficulty | Very Sever Difficulty | Mean Percentage |
|---|---|---|---|---|---|---|---|
| **Walking after dark** | No. | 24 | 49 | 148 | 40 | 4 | **54.62** |
| | % | (9.1%) | (18.5%) | (55.8%) | (15.1%) | (1.5%) | |
| **Seeing at night** | No. | 20 | 55 | 160 | 25 | 5 | **55.66** |
| | % | (7.5%) | (20.8%) | (60.4%) | (9.4%) | (1.9%) | |
| **Adjusting to bright lights** | No. | 4 | 12 | 80 | 126 | 43 | **31.89** |
| | % | (1.5%) | (4.5%) | (30.2%) | (47.5%) | (16.2%) | |
| **Adjusting to dim lights** | No. | 9 | 49 | 123 | 70 | 14 | **47.08** |
| | % | (3.4%) | (18.5%) | (46.4%) | (26.4%) | (5.3%) | |
| **Going from light to dark room or vice versa** | No. | 13 | 55 | 142 | 51 | 4 | **52.08** |
| | % | (4.9%) | (20.8%) | (53.6%) | (19.2%) | (1.5%) | |
| **Findings dropped object's** | No. | 41 | 48 | 73 | 71 | 32 | **49.53** |
| | % | (15.5%) | (18.1%) | (27.5%) | (26.8%) | (12.1%) | |
| **Mean of Glare and dark adaptation** | | | | | | | **48.47** |

Results listed in Table (4.16) indicated that (60.4%) of the participant reported that they had moderately difficulty in seeing at night, while (55.8%) had the same degree of difficulty walking after dark. Moreover (47.5%) had severe difficulty in Adjusting to bright lights. On the other hand, (9.1%) of the participant reported no difficulty at Walking after dark.

The concern of dark adaptation in glaucoma was addressed by Glovinsky *et al. (1992)* who found abnormal scotopic sensitivity in glaucoma patients when compared to normal. Glaucoma patients have difficulties related to lighting, such as glare, and difficulty adapting to different levels of light (Nelson *et al.*, 1999). Mangione *et al. (*1998) reported that 82% of glaucoma subjects had difficulty seeing in the dark compared to 32% of controls.

The three most problematic activities affecting quality of life in open-angle glaucoma patients were "adjusting to bright lights", "going from a light to a dark room or vice versa", and "seeing at night" (Lee *et al.*, 2014).

At Initial diagnosis for newly diagnosed glaucoma patients, difficulty with bright lights and difficulties with light and dark adaptation were the most frequently reported symptoms related to visual function, whereas visual distortion was the most annoying (Janz *et al.*, 2001).

Our study explains this decline because of the glaucoma affected peripheral vision which equal the outer area of the retina that have more rods (Responsible for vision at night and adjust to the dim light), so loss of peripheral vision often resulting insufficient adaptation to darkness and seeing at night.

Our findings consistent with ((Nelson *et al.*, 2003; Goldberg *et al.*, 2009; Viswanathan *et al.*, 1999; Skalicky & Goldberg 2008; Burr *et al.*,2007; Zhou *et al.*, 2014) that glare and dark adaption is the most affected domain in glaucoma patients.

### 4.6 Inferential Analysis

To explore differences in perceptions of the QOL about health-related variables and demographic and socioeconomic characteristic's variables, the researcher conducted inferential analysis as clarified below.

#### 4.6.1 QOL and Gender

##### 4.6.1.1 Differences in perceptions about QOL (SF – 36) according to gender

Table (4.17) Illustrated that gender and QOL positively associated. Results show that, male patients had better QOL than female on all subscales (physical functioning, physical role, general health, vitality, mental health, social functioning, Pain, and emotional role) and on both summary scales PCS and MCS.

**Table (4.17) Differences in perceptions about QOL (SF – 36) per gender**

| | Male n (147) | | Female n (118) | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 74.0 | 20.8 | 65.9 | 26.3 | 2.798 | 0.006 |
| **Role limitation due to physical Health** | 56.0 | 29.5 | 55.5 | 24.7 | 0.131 | 0.896 |
| **Role limitation due to emotional problems** | 62.8 | 32.8 | 52.5 | 30.6 | 2.610 | 0.010 |
| **Energy / Fatigue** | 54.3 | 10.7 | 53.9 | 9.1 | 0.285 | 0.776 |
| **Emotional well being** | 55.7 | 13.5 | 53.4 | 12.7 | 1.421 | 0.157 |
| **Social Functioning** | 78.1 | 25.3 | 64.9 | 31.1 | 3.784 | 0.000 |
| **Pain** | 85.6 | 29.1 | 71.7 | 36.7 | 3.457 | 0.001 |
| **General Health** | 49.3 | 9.3 | 47.7 | 7.9 | 1.464 | 0.144 |
| **MCS** | 70.6 | 16.6 | 60.6 | 19.0 | 4.522 | 0.000 |
| **PCS** | 58.4 | 11.9 | 55.8 | 11.5 | 1.808 | 0.072 |
| **Total SF– 36 domains** | 64.5 | 12.7 | 58.2 | 13.8 | 3.842 | 0.000 |

According to table (4.17) there are statistical differences between Total SF-36 domains and Gender (t = 3.842, Sig =0.000) as indicated by t-test, the differences was in the domains "Physical Function, Role limitation due to emotional problems, Social Functioning and Pain" the differences was for male with means higher than females.

For the Physical Function domain, there were statistical significant differences between the Glaucoma patients (f=2.798; p=0.006) due to gender, the differences were toward the Glaucoma male patients, which means that the male patients have higher scores in the Physical Function domain than the female patients. The mean of male patients was 64.5 while for female was 58.2.

And for the Social Functioning domain, there were statistical significant differences between the Glaucoma patients (f=3.784; P=0.000) due to gender, the differences were toward the Glaucoma male patients, which means that the male patients have higher scores in the Social Functioning domain than the female patients.

Females with chronic health conditions had the poorer quality of life in the physical and psychological domains as compared to males with chronic health conditions (da Rocha et al., 2014), A relatively high prevalence of depression (30%) and anxiety disorders (64%)

among glaucoma patients in Singapore. Female glaucoma patients are more likely to suffer from depression (Lim *et al.*, 2016). Tastan *et al.* (2010) reported that the anxiety risk in women with glaucoma was found to be 7.5 times higher than in men in Turkish patients with glaucoma. Females had increased fear of blindness most of the time, and that fear of blindness was significantly more in women than in men (Janz *et al.* 2007).

Women with good physical and psychosocial health are more likely to have a better QOL (Campos et al. 2014). Woods *et al. (2005*) described that women depend on feelings of discomfort during physical activity in reporting HRQOL as compared to males.

Our findings were consistent with Tran HM *et al.*, (2011) conducted a population-based study in Nigeria reported that the women had worse QOL compared to the men.
Possible explanation could be that the Female in Palestinian society had the greatest responsibility to work both inside and outside the home, raising children and taking care of them also do household causes low scores in the QOL results.

#### 4.6.1.2 Differences in perceptions about QOL (GQL-15) according to gender

Findings and statistical analysis as Table (4.18) indicate that Females in this study had better QOL scores than the male glaucoma patients. Also, it showed that, female patients had better QOL than male on three of four subscales (Central vision, Peripheral vision, Outdoor mobility), and better of the total QOL domains (60.4).

**Table (4.18) Differences in perceptions about QOL (GQL-15) according to gender**

| | Male n (147) | | Female n (118) | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 56.9 | 19.8 | 59.8 | 18.2 | -0.521 | 0.603 |
| **Peripheral vision** | 60.8 | 19.4 | 62.3 | 19.4 | -0.632 | 0.528 |
| **Outdoor mobility** | 66.2 | 25.6 | 67.2 | 25.3 | -0.319 | 0.75 |
| **Glare and dark adaptation** | 49.0 | 18.2 | 49.9 | 17.7 | 0.481 | 0.631 |
| **Total GQL– 15 domains** | 58.4 | 17.9 | 60.4 | 17.3 | -0.922 | 0.358 |

According to table (4.18) t- test indicate that there are no statistical differences between Total GQL– 15 domains and Gender (t = 17.3, Sig = 0.864).

Our findings consistent with (Dhull, 2015) that found all the domains of GQL-15 were affected more in male patients as compared to females except outdoor mobility domain. Odberg *et al.* (2001) reported that the women were more dissatisfied than the men. Also,

result consistent with Zuo *et al.* (2015) that's conduct study to assess vision-related quality of life (VRQOL) in Chinese's glaucoma patients and explore its sociodemographic, clinical and psychological correlates by GQL-15 reported that QOL of female patients better than male patients.

In contrast, result of our study inconsistent with Jain et al. (2015) that's conduct study to assess quality of life of glaucoma patients per WHOQOL-Brief reported that QOL of male better compared to female except in (social domain) female better than male. Moreover, inconsistent with (Labiris *et al.* 2010) described that female glaucoma patients had worse QOL (lower NEIVFQ scores) than male patients.

### 4.6.2 QOL and Age

#### 4.6.2.1 Differences in perceptions about QOL (SF – 36) according to Age

Findings and statistical analysis as Table (4.19) indicate that patients whose age was (18-30) years had better QOL than patients whose age was (31-40) and above 40 years on five of the eight subscales (physical functioning, general health, emotional role, physical role, and Pain)

**Table (4.19) Differences in perceptions about QOL (SF – 36) according to Age**

| | 18 to 30 Yrs. | | 31 – 40 Yrs. | | Above 40 Yrs. | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 88.7 | 17.9 | 80.0 | 11.3 | 67.2 | 24.2 | 11.9 | 0.000 |
| **Role limitation due to physical Health** | 58.7 | 30.7 | 57.4 | 28.4 | 55.2 | 27.0 | 0.219 | 0.803 |
| **Role limitation due to emotional problems** | 60.9 | 32.8 | 46.9 | 34.9 | 59.4 | 31.6 | 1.897 | 0.152 |
| **Energy / Fatigue** | 53.7 | 10.2 | 54.6 | 8.4 | 54.1 | 10.2 | 0.057 | 0.945 |
| **Emotional well being** | 53.4 | 13.2 | 50.5 | 11.2 | 55.4 | 13.3 | 1.767 | 0.173 |
| **Social Functioning** | 70.7 | 24.0 | 75.9 | 24.3 | 71.9 | 29.8 | 0.269 | 0.765 |
| **Pain** | 94.1 | 15.5 | 79.8 | 35.9 | 77.8 | 34.1 | 2.527 | 0.082 |
| **General Health** | 50.0 | 8.0 | 46.3 | 8.7 | 48.7 | 8.8 | 1.263 | 0.284 |
| **MCS** | 69.8 | 14.1 | 63.3 | 19.9 | 66.1 | 18.6 | 0.769 | 0.464 |
| **PCS** | 62.8 | 10.1 | 59.6 | 9.3 | 56.3 | 12.0 | 3.839 | 0.023 |
| **Total SF– 36 domains** | 66.3 | 10.6 | 61.4 | 12.0 | 61.2 | 13.9 | 1.46 | 0.234 |

According to table (4.19) ANOVA test indicate that there are no statistical differences between Total SF-36 domains and age group (F=1.46, Sig.=0.234), but there are statistical differences between Physical Function and age group.

For the Physical Function domain, there were statistical significant differences between the Glaucoma patients (f=11.9; p=0.000) due to age group, the differences were toward the Glaucoma patients with age 18-30, which means that the age group (18-30) patients have higher scores in the Physical Function domain than the other age group patients. The mean of (18-30) age group patients was 88.7 while for (31-40) 80.0 and for (more than 40) 67.2 Tran HM *et al.* (2011) and Magacho *et al.* (2004) reported that younger patients had better QOL. Result consistent with Jain et al. (2015) that's conduct study to assess quality of life of glaucoma patients per WHOQOL-Brief reported that younger patients had better QOL.

Here, our study clarified that the mean score of QOL among younger patients was higher than among older age; the reason is younger patients had early or mild glaucoma and thus has better QOL. Also, younger patients may have a higher educational status than older patients and therefore, a better understanding of the disease, less fear. Moreover, young people in full health and have the power that enables them to perform many tasks. In addition, the (elderly) usually decreases activity at this stage and the weakness of the vital functions of the body will lead to have a low score in Physical Function domain.

#### 4.6.2.2 Differences in perceptions about QOL (GQL-15) according to Age

Findings and statistical analysis as Table (4.20) indicate that patients at different ages have approximately the medium level of GQOL, and patients whose age was (18-30) years had better QOL than other patients.

**Table (4.20) Differences in perceptions about QOL (GQL-15) per Age**

| | 18 to 30 Yrs. | | 31 – 40 Yrs. | | Above 40 Yrs. | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 55.4 | 18.8 | 56.5 | 16.8 | 57.6 | 19.6 | 0.200 | 0.855 |
| **Peripheral vision** | 63.9 | 15.9 | 63.0 | 15.9 | 61.0 | 20.2 | 0.332 | 0.718 |
| **Outdoor mobility** | 65.2 | 24.7 | 70.4 | 18.4 | 66.3 | 26.3 | 0.346 | 0.708 |
| **Glare and dark adaptation** | 51.1 | 17.6 | 47.4 | 14.7 | 48.3 | 18.4 | 0.298 | 0.743 |
| **Total GQL-15** | 58.9 | 15.1 | 59.3 | 13.8 | 58.3 | 18.5 | 0.004 | 0.996 |

According to table (4.20) there are no statistical differences between Total GQL-15 domains and age group (F = 0.004, Sig = 0.996) as indicated by ANOVA test.

With population aging, the number of people with visual impairment and blindness is rapidly growing, as many eye diseases are more widespread among the elderly. Cataract, glaucoma, age-related macular degeneration, and diabetic retinopathy are the most common causes of visual impairment (Bourne et al. 2013)

The main causes of visual impairment were cataracts, refractive error and glaucoma, and Visual impairment was found to be associated with advancing age. Also, Quality of life was found to be poor in the domains of visual function and social interaction, Quality of life was found to be related to the degree of visual impairment (s Oluleye et al. 2014).

Janz *et al. (*2001) and Goldberg *et al. (*2009) reported that the younger glaucoma patients have greater vision-related problems than older patients with glaucoma.

Possible explanation could be: younger patients may have worse QOL and more anxiety when they know the diagnosis of glaucoma, and may be worried about the loss of opportunities, and incomplete dreams that may be their fate if they lose their vision.

### 4.6.3 QOL and Education level

#### 4.6.3.1 Differences in perceptions about QOL (SF – 36) according to Education level

Table (4.21) illustrate that the level of education and QOL are positively associated. Results show that glaucoma patients when attended more education represented higher QOL (mean = 66.8). Also, showed that glaucoma patients at a university level had better scores in all QOL domains (physical functioning, physical role, pain, vitality, mental health, social functioning, and emotional role) except (general health), and had better scores on both summary scales PCS and MCS.

**Table (4.21) Differences in perceptions about QOL (SF – 36) according to Education level**

| | Illiteracy | | Primary | | Secondary | | University | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 45.2 | 32.5 | 70.0 | 19.5 | 74.3 | 21.5 | 78.7 | 18.8 | 16.10 | 0.000 |
| **Role limitation due to physical Health** | 48.3 | 26.7 | 53.3 | 25.9 | 56.8 | 28.8 | 63.0 | 26.7 | 2.127 | 0.097 |
| **Role limitation due to emotional problems** | 46.0 | 33.8 | 54.6 | 30.4 | 60.3 | 33.6 | 68.8 | 28.5 | 3.702 | 0.012 |
| **Energy / Fatigue** | 52.6 | 8.9 | 52.0 | 9.2 | 55.1 | 11.0 | 57.1 | 9.0 | 3.343 | 0.020 |
| **Emotional well being** | 50.2 | 8.3 | 52.3 | 13.1 | 56.9 | 13.0 | 57.6 | 14.6 | 3.901 | 0.009 |
| **Social Functioning** | 49.6 | 29.8 | 72.8 | 27.9 | 75.9 | 27.6 | 77.5 | 26.4 | 7.575 | 0.000 |
| **Pain** | 60.4 | 38.3 | 82.2 | 30.7 | 79.6 | 32.9 | 85.5 | 32.8 | 3.988 | 0.008 |
| **General Health** | 46.7 | 7.8 | 48.6 | 8.3 | 50.0 | 9.3 | 46.6 | 8.3 | 2.110 | 0.099 |
| **MCS** | 51.5 | 19.6 | 65.5 | 15.7 | 68.2 | 18.6 | 72.3 | 17.6 | 9.034 | 0.000 |
| **PCS** | 48.2 | 13.9 | 56.0 | 9.3 | 59.1 | 12.7 | 61.4 | 9.2 | 9.615 | 0.000 |
| **Total SF– 36 domains** | 49.9 | 15.6 | 60.7 | 10.8 | 63.6 | 14.0 | 66.8 | 11.7 | 11.69 | 0.000 |

According to table (4.21) there are statistical differences between Total SF-36 domains and education (F = 11.69, Sig = 0.000) as indicated by ANOVA test, the differences was in the domains "Physical Function, Role limitation due to emotional problems, Energy / Fatigue, Emotional wellbeing, Social Functioning and Pain".

For physical function domain, there were statistically significant differences between Glaucoma patients (F=16.10; p=0.000) regarding educational level. These differences were in favors of the patients at university level, which means that these patients have higher scores in the physical function domain than other patients.

The mean scores of patients at university level were higher than scores of patients at other levels, which represented 78.7. In addition, for role limitation due to emotional problems, there were statistically significant differences between Glaucoma patients (F=3.702; p=0.012) regarding educational level. Once more, these differences were in favors of patients at university level, which means that these patients have higher scores in role limitation due to emotional problems than in other patients. The mean scores of patients at university level were higher than scores of patients at other levels, which represented (68.8).

Again, these differences were in favors of patients to the university level, which means that these patients have higher scores in Energy / Fatigue and Emotional wellbeing, Social Functioning and Pain than in other patients. The mean scores of patients at university level were higher than scores of patients at other levels, which represented (57.1, 57.6, 77.5, 85.5) respectively.

Our study explained that; highly educated patients may have more opportunities as work, and financial support, better awareness and understanding about the disease, its complications, and how to cope with it. Moreover, they have better accessibility to different services and drug availability. This clarifies the importance of education in improving better understanding the nature chronic of the disease and its complications, and managing with it to have good QOL levels.

#### 4.6.3.2 Differences in perceptions about QOL(GQL-15) according to Education level

Table (4.22) illustrate that the level of education and QOL are positively associated. Results show that glaucoma patients at a university level had better scores in total QOL domains.

**Table (4.22) Differences in perceptions about QOL(GQL-15) per Education level**

| | Illiteracy | | Primary | | Secondary | | University | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 40.3 | 10.4 | 55.0 | 17.6 | 59.8 | 18.8 | 59.5 | 22.1 | 3.719 | 0.012 |
| **Peripheral vision** | 49.1 | 16.2 | 60.4 | 17.3 | 64.1 | 21.3 | 65.5 | 18.0 | 5.554 | 0.001 |
| **Outdoor mobility** | 53.5 | 25.6 | 68.1 | 24.7 | 66.7 | 26.0 | 71.7 | 23.3 | 3.414 | 0.018 |
| **Glare and dark adaptation** | 38.1 | 14.0 | 46.9 | 16.0 | 49.9 | 18.5 | 55.0 | 20.0 | 5.998 | 0.001 |
| **Total GQL-15 domains** | 45.3 | 9.8 | 57.7 | 16.2 | 60.1 | 18.5 | 62.9 | 18.4 | 2.924 | 0.035 |

According to table (4.23) ANOVA test indicate that there are statistical differences between Total GQL-15 domains and education (F = 2.924, Sig = 0.035), the differences was for the participant who had university degree.

The study confirmed that the greater level of education, the more QOL. Study attribute this to culture preference and referred to historical appreciation Palestinian people bears to education as a source for security and assurance.

Odberg *et al.* (2001) found that less-educated patients were more afraid of going blind from Glaucoma. Also, Omoti *et al. (*2002) reported that more educated patients presented earlier with less visual field defects than less-educated patients.

Our study explained that; highly educated patients may have more circumstances as work, and economic status. Moreover, they have better accessibility to different services and drug availability. Additionally, these patients can be understanding the chronic nature of the disease and its complications, and how to cope with it**.**

A result from our study consistent with Zhou et al. (2014) that's conduct study to assess vision-related quality of life (VRQOL) in Chinese glaucoma patients and explore its sociodemographic, clinical and psychological correlates by GQOL-15 reported that QOL of patients with high education was better in all four domains, and consistent with other global findings and with local findings.

### 4.6.4 QOL and Marital Status

#### 4.6.4.1 Differences in perceptions about QOL (SF – 36) according to Marital Status

Findings and statistical analysis as Table (4.23) indicate that married patients had better mean scores in five from eight QOL, and single patients had better scores on both summary scales PCS and MCS.

**Table (4.23) Differences in perceptions about QOL (SF – 36) according to Marital Status**

| | Single | | Married | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 75.5 | 30.0 | 69.7 | 22.8 | 1.259 | 0.209 |
| **Role limitation due to physical Health** | 57.5 | 28.0 | 55.5 | 27.4 | 0.37 | 0.712 |
| **Role limitation due to emotional problems** | 61.1 | 32.9 | 57.9 | 32.1 | 0.518 | 0.605 |
| **Energy / Fatigue** | 52.2 | 9.5 | 54.3 | 10.1 | -1.12 | 0.264 |
| **Emotional wellbeing** | 54.4 | 12.8 | 54.7 | 13.2 | -0.133 | 0.894 |
| **Social Functioning** | 65.0 | 29.4 | 73.1 | 28.6 | -1.463 | 0.145 |
| **Pain** | 78.5 | 31.0 | 79.5 | 33.7 | -0.159 | 0.873 |
| **General Health** | 45.8 | 7.7 | 48.9 | 8.8 | -1.845 | 0.066 |
| **MCS** | 71.8 | 14.6 | 66.3 | 18.6 | 1.111 | 0.268 |
| **PCS** | 64.1 | 11.6 | 57.1 | 11.6 | 2.253 | 0.025 |
| **Total SF– 36 domains** | 61.3 | 14.1 | 61.7 | 13.5 | -0.181 | 0.857 |

According to table (4.23) t-test indicate that there are no statistical differences between Total SF-36 domains and Marital Status (t=-0.181, Sig.=0.857).

Tran HM *et al.* (2011) reported that married respondents had better QOL scores than unmarried ones and. No reason was given by the researcher for this finding.

Likewise, Tastan *et al.* (2010) reported that risk of depression was 2.94 times higher in unmarried compared to married participants, and Anxiety scores were higher in unmarried participants and women.

Our study finds that many different studies have shown that marriage really makes people healthier and happier and so the quality of life better for them.

#### 4.6.4.2 Differences in perceptions about QOL(GQL-15) according to Marital Status

Findings and statistical analysis as Table (4.23) indicate that married patients had slightly higher scores in all QOL domains (Central vision, Peripheral vision, Outdoor mobility, Glare and dark adaptation).

**Table (4.24) Differences in perceptions about QOL(GQL-15) per Marital Status**

| | Single | | Married | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 56.0 | 16.6 | 57.4 | 19.4 | -0.351 | 0.726 |
| **Peripheral vision** | 59.7 | 16.1 | 61.7 | 19.8 | -0.516 | 0.606 |
| **Outdoor mobility** | 59.2 | 23.2 | 67.6 | 25.6 | -1.707 | 0.089 |
| **Glare and dark adaptation** | 47.9 | 17.0 | 48.5 | 18.1 | -0.18 | 0.857 |
| **Total GQL– 15 domains** | 56.5 | 13.6 | 59.3 | 18.1 | -0.219 | 0.827 |

According to table (4.24) t-test indicate that there are no statistical differences between Total GQL-15 domains and Marital Status (t=-0.219, Sig.=0.827).

Zuo *et al.* (2015) conducted a study to assess Vision health-related quality of life in Chinese's glaucoma patients reported that VRQOL of married glaucoma patients was probably better than that of patients who were unmarried.

Therefore, provided the high social connection in GGs, Marriage could be seen with these relationships rather than a single (by itself) predictor for wellbeing, and this lead to increase QOL.

### 4.6.5 QOL and address

#### 4.6.5.1 Differences in perceptions about QOL (SF – 36) according to address

Table (4.25) shows the differences in the overall perceptions of QOL per address. Results presented that, glaucoma patients who live in Mid-zone have better means of the following QOL domains: bodily pain, social function, emotional role limitation and on PCS summary scales, and total SF-36 scores than other patients.

**Table (4.25) Differences in perceptions about QOL (SF – 36) according to address**

| | North | | Gaza | | Mid-zone | | Khanunis | | Rafah | | F | Sig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 68.3 | 21.4 | 69.4 | 23.4 | 74.8 | 24.1 | 70.2 | 28.9 | 79.7 | 17.4 | 0.986 | 0.415 |
| **Role limitation due to physical Health** | 57.0 | 25.3 | 53.1 | 28.4 | 65.0 | 22.1 | 54.3 | 26.8 | 66.2 | 30.5 | 1.575 | 0.181 |
| **Role limitation due to emotional problems** | 55.3 | 29.1 | 58.2 | 32.1 | 68.3 | 31.5 | 58.5 | 34.8 | 54.9 | 37.2 | 0.637 | 0.636 |
| **Energy / Fatigue** | 55.5 | 8.2 | 53.9 | 10.5 | 55.3 | 6.6 | 50.5 | 10.9 | 58.5 | 9.6 | 2.541 | 0.040 |
| **Emotional well being** | 55.0 | 10.2 | 55.5 | 13.4 | 55.4 | 13.9 | 52.1 | 14.9 | 53.4 | 13.9 | 0.568 | 0.686 |
| **Social Functioning** | 67.8 | 30.8 | 72.5 | 27.2 | 80.6 | 29.4 | 69.5 | 32.1 | 79.4 | 25.4 | 1.091 | 0.361 |
| **Pain** | 87.8 | 25.6 | 77.5 | 33.9 | 90.8 | 20.9 | 69.6 | 39.8 | 80.4 | 37.5 | 2.429 | 0.048 |
| **General Health** | 47.5 | 8.3 | 49.0 | 8.7 | 51.5 | 8.4 | 46.8 | 9.1 | 49.1 | 8.9 | 1.274 | 0.281 |
| **MCS** | 66.5 | 17.2 | 65.9 | 17.9 | 73.8 | 14.7 | 62.4 | 21.0 | 67.0 | 21.4 | 1.307 | 0.268 |
| **PCS** | 57.1 | 10.8 | 56.4 | 11.9 | 61.6 | 10.2 | 55.5 | 12.5 | 63.4 | 11.5 | 2.333 | 0.056 |
| **Total SF– 36 domains** | 61.8 | 13.2 | 61.1 | 12.8 | 67.7 | 11.8 | 58.9 | 16.1 | 65.2 | 13.8 | 1.775 | 0.134 |

According to table (4.25) at general, there are no statistical differences between Total SF-36 domains and governorates (F=1.775, Sig. =0.134) as indicted by ANOVA test , but there are statistical differences between " Energy / Fatigue, Pain and governorates the differences was for the participant who lives in Rafah with mean 58.5 and 80.4 respectively.

Mid zone governorate elicited the higher level of QOL (67.7), While Gaza governorate elicited the lowest level of QOL (61.1). Here, our study can't clarify why the QOL of patients in the mid-zone is better compared to other governorates, but this may be attributed to the small sample size that equal (7.5%).

#### 4.6.5.2 Differences in perceptions about QOL(GQL-15) according to address

Results in table (4.26), shows the differences in the overall perceptions of QOL per address. Results showed that Glaucoma patients who live in Mid-zone have had slightly higher scores in all QOL domains (Central vision, Peripheral vision, Glare and dark adaptation), except (outdoor mobility), and had better in total GQL-15 scores than other Governorates.

**Table (4.26) Differences in perceptions about QOL(GQL-15) address**

| | North | | Gaza | | Mid-zone | | Khanunis | | Rafah | | F | Sig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 58.2 | 17.9 | 54.0 | 19.7 | 69.7 | 23.3 | 61.8 | 15.4 | 55.5 | 12.0 | 3.628 | 0.007 |
| **Peripheral vision** | 63.3 | 20.7 | 59.9 | 19.2 | 66.0 | 19.7 | 61.5 | 18.8 | 62.7 | 19.5 | 0.609 | 0.657 |
| **Outdoor mobility** | 69.0 | 25.0 | 64.1 | 24.2 | 68.8 | 29.1 | 70.7 | 26.8 | 67.7 | 29.0 | 0.766 | 0.548 |
| **Glare and dark adaptation** | 48.4 | 17.8 | 46.5 | 17.9 | 57.5 | 16.3 | 50.3 | 18.7 | 49.8 | 17.3 | 1.835 | 0.122 |
| **Total GQL-15 domain** | 59.8 | 17.9 | 56.8 | 17.4 | 66.0 | 20.4 | 63.5 | 15.8 | 59.5 | 17.8 | 1.835 | 0.123 |

According to table (4.26) at general, there are no statistical differences between Total GQL-15 domains and governorates (F=-1.835, Sig.=0.123) as indicated by ANOVA test.

Here, the researcher can't clarify why the QOL of patients in the mid-zone is better compared to other governorates, but this may be due to the small sample size that equal (7.5%).

### 4.6.6 QOL and Place services

#### 4.6.6.1 Differences in perceptions about QOL (SF – 36) according to Place services

Table (4.27) shows the differences in the overall perceptions of QOL per Place services. Results presented that, Glaucoma patients receive service in EGH have better scores of the following QOL domains (Physical Function, Role limitation due to physical Health, Role limitation due to emotional problems, Social Functioning, General Health) and on both summary scales PCS and MCS, and total SF-36 scores than other patients in NOH.

**Table (4.27) Differences in perceptions about QOL (SF – 36) according to Place services**

| | NOH | | EGH | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 69.5 | 23.7 | 72.3 | 23.6 | -0.905 | 0.366 |
| **Role limitation due to physical Health** | 52.2 | 28.4 | 63.2 | 23.7 | -3.104 | 0.002 |
| **Role limitation due to emotional problems** | 55.2 | 32.0 | 64.7 | 31.9 | -2.266 | 0.024 |
| **Energy / Fatigue** | 54.7 | 9.2 | 52.8 | 11.5 | 1.488 | 0.138 |
| **Emotional well being** | 55.0 | 12.4 | 54.0 | 14.7 | 0.576 | 0.565 |
| **Social Functioning** | 70.8 | 28.8 | 75.2 | 28.6 | -1.140 | 0.255 |
| **Pain** | 80.9 | 31.5 | 76.3 | 37.0 | 1.048 | 0.296 |
| **General Health** | 48.6 | 8.3 | 48.7 | 9.6 | -0.080 | 0.937 |
| **MCS** | 65.5 | 17.7 | 67.5 | 19.9 | -0.851 | 0.395 |
| **PCS** | 56.2 | 12.0 | 59.2 | 11.1 | -1.945 | 0.053 |
| **Total SF– 36 domains** | 60.9 | 13.1 | 63.4 | 14.3 | -1.421 | 0.156 |

According to table (4.27) t-test indicate that there are no statistical differences between Total SF-36 domains and place of services (t=-1.421, Sig. =0.156) as indicated by ANOVA test, but there are statistical differences between " Role limitation due to physical Health, Role limitation due to emotional problems and place of services the differences was for EGH.

#### 4.6.6.2 Differences in perceptions about QOL(GQL-15) according to Place services

Result in table (4.28), showed that glaucoma patients receive service in EGH have better scores in all QOL domains (Central vision, Peripheral vision, Outdoor mobility, Glare and dark adaptation), and total GQOL-15 scores.

**Table (4.28) Differences in perceptions about QOL(GQL-15) Place services**

| | NOH | | EGH | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 55.8 | 19.6 | 60.4 | 17.7 | -1.766 | 0.079 |
| **Peripheral vision** | 61.2 | 19.7 | 62.0 | 18.8 | -0.324 | 0.746 |
| **Outdoor mobility** | 64.6 | 25.3 | 70.9 | 25.3 | -1.891 | 0.060 |
| **Glare and dark adaptation** | 47.4 | 18.0 | 50.7 | 17.8 | -1.378 | 0.169 |
| **Total GQL– 15 domains** | 58.1 | 17.7 | 61.7 | 17.4 | -1.516 | 0.131 |

According to table (4.28) t-test indicate that there are no statistical differences between Total GQL-15 domains and place of services (t=-1.516, Sig=0.131).

Our study can't clarify why the QOL of patients EGH is better compared to NOH, but this may be attributed to the small sample size from EGH. Other Possible explanation that NOH is the main service provider for Glaucoma in the Gaza Strip, so a lot of cases of glaucoma are converted to it, especially in the latter stages of the disease who's have low QOL that’s will have affected on the Total score of QOL for NOH.

### 4.6.7 QOL and employment

#### 4.6.7.1 Differences in perceptions about QOL (SF – 36) according to employment

The study finding as listed in Table (4.29) indicated that, glaucoma patients who work have higher scores in the domains of physical function, social function and mental health, Pain and on PCS summary, and total SF-36 scores than the patients who do not work.

**Table (4.29) Differences in perceptions about QOL (SF – 36) according to employment**

| | Yes | | No | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 77.3 | 18.6 | 67.9 | 24.8 | 2.883 | 0.004 |
| **Role limitation due to physical Health** | 55.4 | 26.2 | 55.9 | 27.9 | -0.141 | 0.888 |
| **Role limitation due to emotional problems** | 54.3 | 31.2 | 59.7 | 32.5 | -1.199 | 0.232 |
| **Energy / Fatigue** | 53.6 | 9.0 | 54.3 | 10.4 | -0.439 | 0.661 |
| **Emotional wellbeing** | 50.7 | 10.7 | 56.1 | 13.7 | -3.025 | 0.003 |
| **Social Functioning** | 73.0 | 23.8 | 71.9 | 30.4 | 0.277 | 0.782 |
| **Pain** | 84.9 | 30.1 | 77.5 | 34.3 | 1.597 | 0.111 |
| **General Health** | 47.9 | 8.0 | 48.8 | 9.0 | -0.734 | 0.464 |
| **MCS** | 65.7 | 16.3 | 66.3 | 19.1 | -0.226 | 0.821 |
| **PCS** | 58.6 | 9.9 | 56.7 | 12.3 | 1.121 | 0.263 |
| **Total SF– 36 domains** | 62.1 | 10.8 | 61.5 | 14.4 | 0.332 | 0.740 |

According to table (4.29) t-test indicate that there are no statistical differences between Total SF-36 domains and working (t=0.332, Sig. =0.740), but there are statistical differences between " Physical Function, Emotional wellbeing and working the differences was for the participant who is working in physical function with mean 77.3 while it's for a participant who didn't work in emotional wellbeing with mean 56.1.

Our study clarifying why the QOL of patient's work is better compared to patient's not work, due to a patient who is working has better economic status, and having well communication, have better availability to different services and drug. Otherwise, QOL among patients who do not work was lower than that in those who work. Due to financial requirement, lack of resources, and insufficient basic needs that will affected negatively on QOL. For men, the best QOL was associated with high socioeconomic conditions and good physical and psychosocial health (Campos et al. 2014)

### 4.6.7.2 Differences in perceptions about QOL(GQL-15) according to employment

The study finding as listed in Table (4.30) indicated that glaucoma patients who is work have slightly better scores in the following QOL domains (Peripheral vision, Outdoor mobility, Glare and dark adaptation), and total GQL-15 scores.

**Table (4.30) Differences in perceptions about QOL(GQL-15) employment**

| | Yes | | No | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 55.9 | 20.3 | 57.8 | 18.7 | -0.715 | 0.475 |
| **Peripheral vision** | 63.8 | 16.6 | 60.6 | 20.3 | 1.159 | 0.248 |
| **Outdoor mobility** | 68.2 | 20.8 | 66.0 | 26.9 | 0.617 | 0.538 |
| **Glare and dark adaptation** | 49.9 | 19.7 | 48.0 | 17.3 | 0.762 | 0.447 |
| **Total GQL– 15 domains** | 59.4 | 16.7 | 58.1 | 18.1 | 0.112 | 0.911 |

According to table (4.30) t-test indicate that there are no statistical differences between Total GQL-15 domains and work (t=0.112, Sig=0.911).

Most patients with glaucoma (73.6%) not work. This could be from the mean ages of glaucoma patient were higher or could suggest that the burden of living with glaucoma may have forced patients into retirement and not work.

### 4.6.8 QOL and income

#### 4.6.8.1 Differences in perceptions about QOL (SF – 36) according to income

The study finding as listed in Table (4.31) indicated positive association between income and QOL. Patients whose income was less than 1000 NIS were less QOL score (mean=59.4), and those with higher income were better QOL (mean=77.4)

Results also that, glaucoma patients who have an income more than 2000 NIS, have better means of all QOL domains: physical functioning, physical role, general health, vitality, mental health, social functioning, pain, and emotional role, and on both summary scales PCS and MCS and total SF-36 scores compared to patients who have an income of less than 2000 NIS.

**Table (4.31) Differences in perceptions about QOL (SF – 36) according to income**

| | Less than 1000 | | 1000 to 2000 | | Above 2000 | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 66.0 | 24.9 | 76.0 | 16.3 | 92.8 | 8.5 | 16.859 | 0.000 |
| **Role limitation due to physical Health** | 54.1 | 25.5 | 52.3 | 31.9 | 77.2 | 22.5 | 8.217 | 0.000 |
| **Role limitation due to emotional problems** | 55.1 | 30.9 | 58.0 | 33.1 | 84.1 | 29.9 | 8.761 | 0.000 |
| **Energy / Fatigue** | 53.4 | 10.1 | 55.4 | 10.2 | 57.2 | 8.2 | 2.060 | 0.130 |
| **Emotional wellbeing** | 54.7 | 12.9 | 52.4 | 12.9 | 60.2 | 14.3 | 2.882 | 0.058 |
| **Social Functioning** | 68.4 | 29.8 | 75.2 | 24.8 | 96.7 | 10.8 | 11.149 | 0.000 |
| **Pain** | 75.3 | 35.2 | 86.5 | 28.7 | 96.6 | 16.2 | 5.942 | 0.003 |
| **General Health** | 48.0 | 8.3 | 49.3 | 8.8 | 51.5 | 10.9 | 1.859 | 0.158 |
| **MCS** | 63.4 | 18.3 | 68.0 | 16.4 | 84.4 | 11.9 | 15.267 | 0.000 |
| **PCS** | 55.4 | 11.4 | 58.2 | 11.5 | 69.7 | 6.6 | 17.329 | 0.000 |
| **Total SF– 36 domains** | 59.4 | 13.4 | 63.1 | 11.4 | 77.0 | 7.4 | 20.494 | 0.000 |

According to table (4.31) ANOVA test indicate that there are statistical differences between Total SF-36 domains and income (F=20.494, Sig. =0.000), the differences was for the participant who had income above 2000 NIC with mean 77.0 while there are no statistical differences between Energy/ Fatigue, general Health and income.

A result of our study consistent with Jain et al. (2015) that's conduct study to assess quality of life of glaucoma patients per WHOQOL-Brief reported that QOL of patients with high income was better, and Poor quality of life in all four domains was found to associate with lower income.

### 4.6.8.2 Differences in perceptions about QOL(GQL-15) according to income

The study finding as listed in Table (4.32) indicated positive association between income and QOL. Result also showed glaucoma patients who have an income more than 2000 NIS, have better means of all QOL (Central vision, Peripheral vision, Outdoor mobility, Glare and dark adaptation), and total GQL-15 scores (mean =85.3).

**Table (4.32) Differences in perceptions about QOL(GQL-15) according to income**

| | Less than 1000 | | 1000 to 2000 | | Above 2000 | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 54.7 | 16.8 | 53.2 | 17.4 | 85.3 | 16.7 | 35.106 | 0.000 |
| **Peripheral vision** | 58.2 | 17.7 | 60.5 | 17.4 | 89.9 | 13.8 | 34.112 | 0.000 |
| **Outdoor mobility** | 63.8 | 25.5 | 65.3 | 21.9 | 92.4 | 17.6 | 14.335 | 0.000 |
| **Glare and dark adaptation** | 45.9 | 15.9 | 45.8 | 16.4 | 75.7 | 14.8 | 36.747 | 0.000 |
| **Total GQL–15 domains** | 55.9 | 15.2 | 59.0 | 13.5 | 85.3 | 18.5 | 34.122 | 0.000 |

According to table (4.32) ANOVA test indicate that there are statistical differences between Total GQOL-15 domains and income (F=34.122, Sig.=0.000), the differences was for the participant who had income above 2000 NIC with mean 85.3.

Our study clarifying why the QOL of patients with high income more than 2000NIS is better compared to other patients who is less than 2000 NIS due to have better socioeconomic status, have a purchasing power that enables it to buy all the medicines despite the high price tag and can make the necessary surgical procedures that maintain the stability of his health, have better availability to different services.

Also, they can provide all the basic needs and even entertainment and that make them live in a state of stability and satisfaction.

Our findings consistent with Zuo *et al.* (2015) conducted study to assess Vision health-related quality of life in Chinese by GQL-15 among glaucoma patients reported that VRQOL of high income glaucoma patients was better than patients of low income in all four domains.

### 4.6.9 QOL and other eye diseases

#### 4.6.9.1 Differences in perceptions about QOL (SF – 36) according to other eye disease

The study finding as listed in Table (4.33) illustrate that QOL and other eye disease positively association. Results also showed that, Glaucoma patients don't have another eye disease have better scores of the all QOL domains (Physical Function, Role limitation due

to physical Health, Role limitation due to emotional problems, Emotional wellbeing, Social Functioning, pain, Energy/ Fatigue, General Health) and on both summary scales PCS and MCS, and total SF-36 scores than patients have other eye disease.

**Table (4.33) Differences in perceptions about QOL (SF – 36) according to other eye disease**

| | Yes | | No | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 68.0 | 24.7 | 71.9 | 23.0 | -1.326 | 0.186 |
| **Role limitation due to physical Health** | 49.0 | 29.1 | 60.0 | 25.5 | -3.244 | 0.001 |
| **Role limitation due to emotional problems** | 50.8 | 31.6 | 63.0 | 31.7 | -3.043 | 0.003 |
| **Energy / Fatigue** | 53.5 | 9.2 | 54.5 | 10.5 | -0.776 | 0.438 |
| **Emotional wellbeing** | 53.1 | 12.4 | 55.7 | 13.5 | -1.560 | 0.120 |
| **Social Functioning** | 68.0 | 29.7 | 74.9 | 27.9 | -1.930 | 0.055 |
| **Pain** | 78.4 | 32.0 | 80.1 | 34.2 | -0.386 | 0.700 |
| **General Health** | 47.2 | 8.5 | 49.5 | 8.8 | -2.100 | 0.037 |
| **MCS** | 62.6 | 17.4 | 68.4 | 18.7 | -2.543 | 0.012 |
| **PCS** | 54.4 | 12.1 | 59.0 | 11.2 | -3.127 | 0.002 |
| **Total SF– 36 domains** | 58.5 | 12.9 | 63.7 | 13.5 | -3.094 | 0.002 |

According to table (4.33) t-test indicate that there are statistical differences between Total SF-36 domains and Suffering from other eye diseases (t=-3.094, Sig. =0.002), the differences was for the participant who did not Suffering from other eye diseases with mean 63.7, while there are no statistical differences between Physical Function, Energy / Fatigue, Emotional wellbeing, Pain and Suffering from another eye diseases.

Visual impairment due to ocular diseases has a negative impact on physical and mental health and is a global interest. In the USA, visual disability ranks among the top ten disabilities. (Courtney-Long *et al.* 2015)**.**

Decreased QOL was associated with the presence of glaucoma or corneal disease independent of visual acuity and with cataract or retinal disease as a function of visual acuity. (Nutheti *et al.* 2006)**.**

#### 4.6.9.2 Differences in perceptions about QOL(GQL-15) according to other eye disease

The study finding as listed in Table (4.34) illustrate that QOL and other eye disease positively association. Results also showed that, Glaucoma patients don't have another eye disease have better scores of the all QOL domains (Peripheral vision, Central vision, Outdoor mobility, Glare and dark adaptation), and total GQOL-15 scores (mean = 62.0).

**Table (4.34) Differences in perceptions about QOL(GQL-15) according to other eye disease**

| | Yes | | No | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 53.4 | 17.0 | 59.8 | 20.1 | -2.587 | 0.010 |
| **Peripheral vision** | 56.9 | 19.9 | 64.4 | 18.6 | -3.106 | 0.002 |
| **Outdoor mobility** | 61.7 | 25.2 | 69.8 | 25.1 | -2.555 | 0.011 |
| **Glare and dark adaptation** | 44.1 | 17.5 | 51.2 | 17.8 | -3.187 | 0.002 |
| **Total GQOL– 15 domains** | 55.0 | 16.5 | 62.0 | 17.9 | -3.077 | 0.002 |

According to table (4.34) t-test indicate that there are statistical differences between Total GQOL-15 domains and Suffering from other eye diseases (t=-3.077, Sig.=0.002), the differences were for the participant who did not Suffer from other eye diseases with mean 62.0.

Cataract influences glaucoma-related QOL among glaucoma patients of all severity levels and is an important cause of potentially reversible visual impairment among glaucoma patients (Skalicky *et al.* 2015). Sung *et al. (*2017) conduct **study** to evaluate vision-related quality of life in Korean glaucoma patients and to explore the associated factors reported that the lower (NEI VFQ-25) Rasch score showed a significant association in the presence of other ocular diseases.

Patients treated for primary open-angle glaucoma or ocular hypertension often have ocular surface diseases, more often and more severely in older patients getting more drugs and presenting with more severe glaucoma. These high prevalence values might therefore have consequences on the burden of the disease in terms of adherence to treatment and quality of life (Baudouin *et al.* 2012).

Fechtner *et al.* (2010) conduct **a** study to determine the prevalence of ocular surface disease (OSD) in patients with glaucoma using topical intraocular pressure (IOP)-lowering therapy and reported OSD is prevalent among medically treated patients with glaucoma. The severity of OSD symptoms is positively correlated to the number of IOP-lowering medications used. As many as six in every ten patients with glaucoma have ocular surface disease, and this can have a huge impact on their daily lives.

OSD adversely affects patients' quality of life causing discomfort and problems with vision which in turn may result in noncompliance, lack of adherence, and eventually visual impairment (Kaštelan *et al.* 2010).OSD has an estimated prevalence of 15% among individuals older than 65 years and this rises to 59% in patients with glaucoma. (Leung *et al.* 2008).

Patients with topically treated glaucoma present dry eye syndrome more often than a similar control group. The presence of dry eye syndrome negatively influences the patient's QOL (Rossi *et al.* 2008).

Moreover, Skalicky *et al.* (2012) reported that OSD was more common in patients with increasing glaucoma severity and is associated with poorer glaucoma-related QOL.

### 4.6.10 QOL and comorbidities

#### 4.6.10.1 Differences in perceptions about QOL (SF – 36) according to comorbidities

The study findings as listed in Table (4.35) indicated positive association between comorbidities and QOL. Results also showed that glaucoma patients who reported having a chronic disease were worse off than those who did not.

Results also showed that, glaucoma patients not have chronic disease have better scores of the all QOL domains (Physical Function, Role limitation due to physical Health, Role limitation due to emotional problems, Social Functioning, pain, Energy/ Fatigue, General Health) and on both summary scales PCS and MCS, and total SF-36 scores than patients have a history of chronic disease.

**Table (4.35) Differences in perceptions about QOL (SF – 36) according to comorbidities**

| | Yes | | No | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 65.8 | 26.1 | 75.9 | 19.1 | -3.510 | 0.001 |
| **Role limitation due to physical Health** | 53.1 | 27.6 | 59.0 | 26.9 | -1.739 | 0.083 |
| **Role limitation due to emotional problems** | 56.3 | 33.5 | 60.6 | 30.6 | -1.066 | 0.287 |
| **Energy / Fatigue** | 53.7 | 10.5 | 54.5 | 9.5 | -0.661 | 0.509 |
| **Emotional well being** | 55.0 | 13.3 | 54.4 | 13.0 | 0.377 | 0.706 |
| **Social Functioning** | 67.7 | 31.6 | 77.7 | 23.9 | -2.866 | 0.004 |
| **Pain** | 71.3 | 37.6 | 89.2 | 24.1 | -4.517 | 0.000 |
| **General Health** | 47.1 | 8.5 | 50.4 | 8.7 | -3.091 | 0.002 |
| **MCS** | 62.6 | 20.2 | 70.5 | 14.8 | -3.559 | 0.000 |
| **PCS** | 54.9 | 12.4 | 59.9 | 10.3 | -3.519 | 0.001 |
| **Total SF– 36 domains** | 58.8 | 14.6 | 65.2 | 11.2 | -3.968 | 0.000 |

According to table (4.35) at general, there are statistical differences between Total SF-36 domains and Suffering from Chronic diseases (t=-3.968, Sig.=0.000) as indicted by t-test , the differences were for the participant who didn't Suffer from Chronic diseases with mean 65.2, while there are no statistical differences between Role limitation due to physical Health, Role limitation due to emotional problems, Emotional wellbeing, Energy / Fatigue, Emotional wellbeing and Suffering from Chronic diseases.

DM-hypertension comorbidity and cardiovascular diseases had the most negative effect on the QOL scores in the physical domain. Mental disorders had the worst effect on the psychological and social relationships domains, and respiratory diseases had the worst effect on the environmental domain (Tüzün *et al.* 2015). In contrast, chronic diseases can be related to increased depressive symptoms, and the depression associated chronic diseases can negatively affect QOL (Bayliss *et al.* 2012).

### 4.6.10.2 Differences in perceptions about QOL(GQL-15) according to comorbidities

Findings and statistical analysis as Table (4.36) indicate that glaucoma patients not have a chronic disease have better scores in all QOL domains (Peripheral vision, Central vision, Outdoor mobility, Glare and dark adaptation), and total GQL-15 scores.

**Table (4.36) Differences in perceptions about QOL(GQL-15) according to comorbidities**

| | Yes | | No | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 56.0 | 18.6 | 58.7 | 19.7 | -1.096 | 0.274 |
| **Peripheral vision** | 58.8 | 19.5 | 64.6 | 18.9 | -2.443 | 0.015 |
| **Outdoor mobility** | 64.3 | 26.1 | 69.4 | 24.4 | -1.619 | 0.107 |
| **Glare and dark adaptation** | 46.9 | 17.1 | 50.3 | 18.9 | -1.546 | 0.123 |
| **Total GQL– 15 domains** | 57.6 | 17.0 | 61.1 | 18.2 | -1.576 | 0.116 |

According to table (4.36) at general, there are no statistical differences between total GQOL-15 domains and Suffering from Chronic diseases (t=-1.576, Sig.=0.116).

Lin *et al.* (2010) conduct a study to Comparison of comorbid conditions between open-angle glaucoma patients and a control cohort: a case-control study reported that Open-angle glaucoma patients were significantly more likely to have comorbidities, many of which can be life threatening or can affect the quality of life significantly.

Other chronic conditions also produce problems in pain and discomfort or daily activities, but differ from visual impairment in which activity they impede. Therefore, visually impaired patients with other chronic conditions maybe have more problems in a greater number of daily activities. Patients who are only visually impaired have also less pain or discomfort than those with comorbid conditions.

A result from our study consistent with Zuo *et al.* (2015) conducted a study to assess Vision health-related quality of life in Chinese by GQL-15 among glaucoma patients reported that VRQOL of glaucoma patients with comorbid had worse than patients of without comorbid.

Significant factors regarding impact on the quality of life were found concerning the complications to glaucoma, with an impaired visual acuity and visual field, and concerning the co-morbidity, especially concerning general diseases, both vascular and non-vascular (Wändell *et al.* 1997).

### 4.6.11 QOL and Duration of the disease

#### 4.6.11.1 Differences in perceptions about QOL (SF – 36) according to Duration of the disease

The study finding as listed in Table (4.37) illustrate that, glaucoma patients have disease duration less than 5 years have slightly better scores of the all QOL domains (Physical Function, Role limitation due to physical Health, General Health) and on PCS summary scale, and total SF-36 scores.

**Table (4.37) Differences in perceptions about QOL (SF – 36) according to Duration of the disease**

| | Less than 5 Yrs. | | 5 to 10 Yrs. | | Above 10 Yrs. | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 75.5 | 21.0 | 65.2 | 25.7 | 66.8 | 24.4 | 5.533 | 0.004 |
| **Role limitation due to physical Health** | 57.6 | 25.9 | 55.6 | 25.8 | 52.8 | 31.3 | 0.696 | 0.500 |
| **Role limitation due to emotional problems** | 57.1 | 31.6 | 57.3 | 32.5 | 61.1 | 33.1 | 0.393 | 0.676 |
| **Energy / Fatigue** | 53.5 | 10.5 | 54.2 | 8.9 | 55.1 | 10.3 | 0.567 | 0.568 |
| **Emotional well being** | 55.2 | 13.7 | 52.9 | 11.6 | 55.7 | 13.6 | 0.940 | 0.392 |
| **Social Functioning** | 75.1 | 28.1 | 64.3 | 30.2 | 75.2 | 27.2 | 3.789 | 0.024 |
| **Pain** | 77.5 | 35.4 | 78.3 | 30.6 | 83.8 | 32.4 | 0.875 | 0.418 |
| **General Health** | 49.1 | 8.7 | 47.8 | 8.7 | 48.5 | 8.8 | 0.580 | 0.561 |
| **MCS** | 66.2 | 18.3 | 63.2 | 18.8 | 68.9 | 17.9 | 1.771 | 0.172 |
| **PCS** | 58.9 | 11.2 | 55.7 | 10.8 | 55.8 | 13.2 | 2.453 | 0.088 |
| **Total SF– 36 domains** | 62.6 | 12.7 | 59.4 | 13.9 | 62.4 | 14.4 | 1.338 | 0.264 |

According to table (4.37) at general, there is are statistical differences between Total SF-36 domains and duration of the disease (F=1.338, Sig.= 0.264) as indicated by ANOVA test, but there are statistical differences between " Physical Function, Social Functioning and Duration of the disease the differences was for the participant who has disease duration from 5 years and less in physical function with mean 75.5 while it's for a participant who has disease duration above 10 years in Social Functioning with mean 75.2.

Our study explained that the mean score of some QOL domain among older patients was higher than among younger age; the reason is: the elderly may have adapted with the disease and with the truth in which they live, Moreover, positive religious dimension leads also to general satisfaction with health condition.

Janz *et al. (2007*) conduct a study to assess fear of blindness in glaucoma patients over time and reported that the most significant correlate over time was the perceived impact of the disease on an individual's ability to perform visual tasks. They noted a reduction from 34% of patients who were afraid of going blind at the onset to 11–12% after 5 years. They attached this reduction to faith, more knowledge about the low risk of blindness with treatment and adaptation to the diagnosis.

### 4.6.11.2 Differences in perceptions about QOL(GQL-15) according to Duration of the disease

The study finding as listed in Table (4.38) illustrate that QOL and duration of disease positively association. Results also showed that, glaucoma patients have a duration of disease (less than 5 years) have better scores in all QOL domains (Peripheral vision, Central vision, Outdoor mobility, Glare and dark adaptation), and total GQL-15 scores than patients have duration more than 5 years.

**Table (4.38) Differences in perceptions about QOL(GQL-15) according to Duration of the disease**

| | Less than 5 Yrs. | | 5 to 10 Yrs. | | Above 10 Yrs. | | F test | Sig. |
|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 63.0 | 18.3 | 53.3 | 18.5 | 51.0 | 18.4 | 10.947 | 0.000 |
| **Peripheral vision** | 69.5 | 17.6 | 59.7 | 22.0 | 49.5 | 11.4 | 29.983 | 0.000 |
| **Outdoor mobility** | 79.1 | 19.9 | 65.9 | 29.0 | 46.2 | 14.3 | 52.927 | 0.000 |
| **Glare and dark adaptation** | 53.0 | 18.6 | 46.5 | 20.6 | 42.8 | 10.9 | 8.381 | 0.000 |
| **Total GQOL– 15 domains** | 66.8 | 16.0 | 56.8 | 19.7 | 48.1 | 10.2 | 29.651 | 0.000 |

According to table 4.39 at general, there are statistical differences between Total GQOL-15 domains and treatment period (F=29.651, Sig. =0.000) as indicated by ANOVA test, the differences was for the participant who was treated from 5 years with mean 66.8**.**

A trend of deterioration QOL score was noted from this study and suggests that QOL deteriorates with progression of disease. This result consistent with. (Janz *et al.*, 2001; Nelson *et al.*, 2003; Parrish 1996; Skalicky & Goldberg 2008; Goldberg *et al.*, 2009).

Floriani et al., (2015) conduct study to assess Health-related quality of life in patients with primary open-angle glaucoma reported that QOL decreased with advancing disease severity. Visual field loss in progressing glaucoma is independently associated with a loss in both disease-specific and generic quality-of-life (van Gestel et al., 2010).

Our study explained the worse in the VRQOL with increasing the duration due to the disease is progressive over time and the lack of follow-up, adherence to treatment also health problems that associated with elderly, which worsens the QOL level.

Result consistent with Zuo *et al.* (2015) conducted a study to assess Vision health-related quality of life in Chinese among glaucoma patients reported that VRQOL of glaucoma patients had worse with increasing the duration of disease.

### 4.6.12 QOL and compliance with treatment

#### 4.6.12.1 Differences in perceptions about QOL (SF – 36) according to compliance with treatment

The study finding as listed in Table (4.39) illustrate that, compliance glaucoma patients with treatment have slightly better scores of the all QOL domains (Physical Function, Role limitation due to physical Health, General Health) and on PCS summary scale, and total SF-36 scores.

**Table (4.39): Differences in perceptions about QOL (SF – 36) according to compliance with treatment**

| | Yes | | No | | t test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Physical Function** | 70.8 | 23.4 | 58.3 | 29.2 | 1.556 | 0.121 |
| **Role limitation due to physical Health** | 56.1 | 27.5 | 47.2 | 23.2 | 0.951 | 0.343 |
| **Role limitation due to emotional problems** | 57.9 | 32.2 | 66.7 | 33.3 | -0.799 | 0.425 |
| **Energy / Fatigue** | 54.5 | 9.6 | 42.2 | 14.8 | 3.704 | 0.000 |
| **Emotional wellbeing** | 54.4 | 13.1 | 62.7 | 13.7 | -1.858 | 0.064 |
| **Social Functioning** | 72.4 | 29.1 | 68.1 | 18.9 | 0.441 | 0.660 |
| **Pain** | 79.8 | 33.2 | 69.2 | 37.1 | 0.938 | 0.349 |
| **General Health** | 48.7 | 8.8 | 46.7 | 5.6 | 0.671 | 0.503 |
| **MCS** | 66.1 | 18.3 | 66.6 | 21.6 | -0.082 | 0.935 |
| **PCS** | 57.5 | 11.6 | 48.6 | 13.4 | 2.248 | 0.025 |
| **Total SF– 36 domains** | 61.8 | 13.5 | 57.6 | 15.4 | 0.913 | 0.362 |

According to table (4.39) at general, there are no statistical differences between Total SF-36 domains and compliance with treatment (t=1.681, Sig.=0.362) as indicated by t-test, but there are statistical differences between " Energy / Fatigue and Adherence to treatment the differences was for the participant who compliance with treatment with mean 54.5.

### 4.6.12.2 Differences in perceptions about QOL(GQL-15) according to compliance with treatment

The study finding as listed in Table (4.40) illustrate that, glaucoma patients who compliance with treatment had better scores in three from four QOL domains (Peripheral vision, Outdoor mobility, Glare and dark adaptation), and total GQOL-15 scores than patient's who not compliance with treatment.

**Table (4.40) Differences in perceptions about QOL(GQL-15) according compliance with treatment**

| | Yes | | No | | F test | Sig. |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| **Central vision** | 57.0 | 19.5 | 58.1 | 19.4 | -0.696 | 0.487 |
| **Peripheral vision** | 61.6 | 19.6 | 56.0 | 13.0 | 0.853 | 0.394 |
| **Outdoor mobility** | 67.0 | 25.4 | 55.6 | 24.3 | 1.328 | 0.185 |
| **Glare and dark adaptation** | 48.7 | 18.1 | 42.6 | 11.7 | 0.998 | 0.319 |
| **Total GQL– 15 domains** | 59.1 | 17.8 | 54.5 | 8.3 | -0.226 | 0.822 |

According to table (4.40) at general, there is no statistical differences between Total GQL-15 domains and compliance with treatment (t=-0.226, Sig.=0.822) as indicated by t-test.

The full-adherence rate is low among glaucoma patients. Having less belief in the need for and more concerns about their medication are the 2 factors associated with nonadherence (Loon *et al.*, 2015)

Glaucoma patients are more likely to be adherent to their medication if they understand the disease and the rationale for treatment and if their treatment regimen is simplified (Robin *et al.*, 2011).

Rotchford *et al.*, (1998) conduct study to assess compliance with timolol treatment in glaucoma reported that compliance with treatment is poor and patients underestimate their level of defaulting when questioned.
A patient's perception, belief system and experiences may also affect his/her QOL.

This fear of blindness can have several effects on the patient's attitude. It may create a healthy care that makes the patient extremely compliant and adherent to drug usage and follow-up visits, which is useful. or it could make the patient, hopeless and uninterested in whatever therapy is being offered to them with following poor drug compliance and irregular attendance at clinic visits.

Our study explained that the compliance patients have better QOL than not compliance due to treatment is directed at reducing eye pressure to prevent optic nerve damage and loss of vision. And treatment in glaucoma is to improve clinical outcome by preventing further

progression of the disease and in the end, preserve or improve the patients QOL. Therefore, patients must adherence to treatment.

Possible explains for not compliance, that glaucoma is a chronic disease often requiring many years of treatment, which can be inconvenient and expensive. And many patients simply "forget" to take their medication, and many glaucoma medications have side effects that range from unpleasant to disabling.

# Chapter (5) Conclusion and Recommendations

This chapter provides the main conclusion and the recommendations for the key persons and decision makers in MOH to focus on improving the Glaucoma patient's life that increase QOL for those patients.

## 5.1 Conclusion

Glaucoma represents a most important threat for millions of people around the world, including Palestine. Glaucoma disease in GS is considered one of the exhausting diseases. Glaucoma patients suffer from two aspects; the chronic nature of the disease itself in terms of regular hospital visits, drug availability, side effects of drugs and disease complications, and the implications of the disease on the quality of life of a patient.

Dimensions of QOL among Glaucoma patients relatively are reduced, per that reduction; improvement of life's dimensions is the key of achieving better coping with that disease. This study has proven that glaucoma has broad 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.

Early detection and aggressive treatment of early glaucoma should be improved to prevent progression of the disease and decrease in QOL.

The conduction of this study is to discover what is important for understanding how glaucoma disease affects the QOL of patients, and reduced QOL domains. Glaucoma can affect the ability of patients to perform activities of daily living and personal care and can cause poor learning and mobility. All these at last lead to loss of self-confidence and independence.

This study has used a quantitative measure that providing an important assessment of the QOL among Glaucoma patients in GS. It also gives powerful and multidimensional concepts about QOL among Glaucoma patients. Additionally, it provides a detailed and widespread understanding of how the disease affects the QOL of patients.

This study has been conducted to assess the QOL among patients with Glaucoma disease who live in GS to improve the patients' life that may positively affect the health status. The study explores the eight SF-36 domains and four GQOL-15 domains. It also explores the

differences in perceptions of Glaucoma patients for QOL about demographics, socioeconomic and health profile variables.

Regardless of suffering from Glaucoma disease, the response rate was high and the total SF-36 mean score was 61.7 (SD=13.5), meaning that most of the respondents had a medium perception level of QOL. The overall mean percentage of SF-36 domain scores ranged from (48.58%) to (79.4%).

The bodily pain domain got the highest score with equaled (79.4%). Moreover, the social function domain was (72.22%), the physical function domain (70.32%), the emotional role limitation (58.24%), the role limitation due to physical health (55.75), the mental health domain -*Emotional wellbeing*- (54.7%), the vitality domain (54.09%), and the lowest domain were General health with equaled (48.58%).

Also, the total GQOL-15 mean score was 59.2 (SD=17.6), meaning that most of the respondents had a medium perception level of QOL and the overall mean percentage of GQOL-15 domain scores ranged from (48.5%) to (66.6%).

The Outdoor mobility domain got the highest score with equaled (66.6%). Moreover, the Peripheral vision domain was (61.4%), the Central vision domain (57.3), and the lowest domain were Glare and dark adaptation with equaled (48.5%).

The study results demonstrate a significant positive perception of Glaucoma patients, about their QOL. Moreover, most of them are satisfied with their health, which means that, religious dimension of GG community, social support system of GG and how the religiosity factor could influence QOL and subjective well-being and how patients in difficult conditions accept peacefully their fate.

Significant differences were explored concerning demographic variables. Regarding the gender, there were statistically significant differences between Total SF-36 domains and Gender, the differences was in the domains "Physical Function, Role limitation due to emotional problems, Social Functioning and Pain" the differences was for male with means higher than females. In contrast, there were no statistical differences between Total GQOL– 15 domains and gender.

Regarding the educational level, there were significantly differences between educated patients, particularly university level in comparison with illiterate and primary level

patients. Results show that glaucoma patients when attended more education represented higher QOL

Regarding the age, there were no statistically significant differences between Total SF-36 domains and Gender, but there are statistical differences between Physical Function and age group. The differences were toward the glaucoma patients with age (18-30) that have higher scores in the Physical Function domain than the other age group patients. On the other hand, there were no statistical differences between Total GQOL– 15 domains and age group.

Concerning the marital status of patients, there were no statistically significant differences between Total SF-36 domains and Marital status. Moreover, there were no statistical differences between Total GQOL– 15 domains and marital status.

There were no statistically significant differences between Total SF-36 domains and (Address, Place of service). Moreover, there were no statistical differences between Total GQOL– 15 domains and (Address, Place of service).

According to the socioeconomic variables, Significant differences were explored.
Regarding the employment, the study reported no statistically significant differences between Total SF-36 domains and working, but there are statistical differences between Physical Function, Emotional wellbeing and working for the participant who is working. This means that QOL is in favor of patients who work than patients who don't work.

This could be explained as working patients have better economic status, and having well communication, have better availability to different services and drug. Then again, there were no statistical differences between Total GQOL– 15 domains and employment.

For the income, there were statistically significant differences between Total SF-36 domains and income, the differences were in all QOL domains (physical functioning, physical role, general health, vitality, mental health, social functioning, and emotional role domains).

Furthermore, there were statistical differences between Total GQOL– 15 domains and income, the differences were in all QOL domains (Peripheral vision, Central vision, Outdoor mobility, Glare and dark adaptation). which means that patients with high income have a better degree of QOL domains.

Regarding to health profile variables, the study found that glaucoma patients without another ocular disease have a better score of all QOL domains in (SF-36 and GQOL-15). Moreover, the study found that glaucoma patients without comorbidities have a better score of all QOL domains IN (SF-36 and GQOL-15).

For the duration of the disease, there were no statistically significant differences between Total SF-36 domains and duration of the disease, but there are statistical differences between Physical Function, Social Functioning and duration of the disease, the differences were for the patients who have disease duration less than 5 years. On the other hand, there were statistical differences between Total GQOL– 15 domains and Duration of the disease, the differences were in all QOL domains (Peripheral vision, Central vision, Outdoor mobility, Glare and dark adaptation) for the patients who have disease duration less than 5 years. Which means that patients with disease duration less than 5 years have a better degree of QOL domains.

Regarding to compliance with treatment, there were no statistically significant differences between Total SF-36 domains and compliance with treatment. Moreover, there were no statistical differences between Total GQOL– 15 domains and compliance with treatment.

### 5.2 Recommendations

This study has provided useful information about QOL of patients with Glaucoma disease. Based on the findings and experiences gained throughout the study the following recommendation oriented to NOH and EGH management, followed by recommendation to MOH.

**Regarding NOH and EGH management, the following is recommended:**

- Routine constant QOL assessment is helpful to recognize individual areas of need, which can be addressed and establishing screening program among elderly people. and there should be a clear protocol on how to use the information obtained from QOL assessments.
- Vision rehabilitation program
- Provision of visual filed instrument in NOH.
- Inclusion of contrast sensitivity, glare and dark adaptation assessment in routine clinical management of glaucoma patients.

- Professional psychological support and low vision care should be provided for patients who need it to prevent mental health issues, behavioral problems and illness complications.
- Development of medical patient file at diagnostic units, and enhance proper documentation specially at post care and follow up stages.
- Supporting optometry care by designing and implementing educational programs for the optometrist to help them to provide optometry interventions to Glaucoma patients and counseling sessions, to be able to cope with the new condition.

**MOH is the main regulator of Palestinian health care system, so it has to be responsive to hospital needs through:**

- Achieving stability in the availability of fundamental medications.
- Multisector coordination between MOH, Ministry of Labor and Ministry of Social Affairs to support, meet needs and provision of suitable treatment for patients that in turn comprehensively improves the disease burden and the QOL in glaucoma patients.
- Empowering health information system at hospitals to enhance regular monitoring of hospitals performance, and improve registration system.
- Increase the number of ophthalmology doctor with subspecialty in Glaucoma and Increase the number of Glaucoma units in both NOH and EGH.

**Encouragement for Future Research Studies**

## References:


Abu-Muammar, A (2014) Assessment of the Quality of Life among Thalassemia Patients in the Gaza Strip. Un-published thesis: Al-Quds University. Palestine

Al Nasser Ophthalmic Hospital. (2014). **Annual Report 2014.** MOH. Gaza.

Al Nasser Ophthalmic Hospital. (2015). **Annual report 2015.** MOH. Gaza.

Al Nasser Ophthalmic Hospital.(2012-a).Hospital Definition. http://www.moh.gov.ps/eyeh/index.php?option= com_content&view=articled=6&Item=4. [Electronically Accessed pdf 1th April 2016]

Albrecht GL. Subjective health assessment. In: Jenkinson C (ed). Measuring health and medical outcomes. UCL, London, 1994; 7-26

Anderson, R. S. (2006). The psychophysics of glaucoma: Improving the structure/function relationship. *Progress in Retinal and Eye Research, 25*(1), 79-97.

Asaoka R, Crabb DP, Yamashita T, Russell RA, Wang YX, Garway-Heath DF (2011)

Aspinall PA, Hill AR, Dhillon B, Armbrecht AM, Nelson P, Lumsden C, Farini Hudson E, Brice R, Vickers A, Buchholz P (2007). Quality of life & relative importance: a comparison of time-trade off and conjoint analysis methods in patients with age-related macular degeneration. Br J Ophthalmol; 91: 766-772.

Aspinall, P. A., Johnson, Z. K., Azuara-Blanco, A., Montarzino, A., Brice, R., & Vickers, A. (2008). Evaluation of quality of life and priorities of patients with glaucoma. *Investigative ophthalmology & visual science*, *49*(5), 1907-1915.

Ayuob, A. (2012). *Quality of life among dialsis patients in United Arab Emirates*. Victoria University of Wellington. *(Unpublished research)*

Baudouin, C., Renard, J. P., Nordmann, J. P., Denis, P., Lachkar, Y., Sellem, E., ... & Bouée, S. (2012). Prevalence and risk factors for ocular surface disease among patients treated over the long term for glaucoma or ocular hypertension. *European journal of ophthalmology*, *23*(1), 47-54.

Bayliss, M., Rendas-Baum, R., White, M. K., Maruish, M., Bjorner, J., & Tunis, S. L. (2012). Health-related quality of life (HRQL) for individuals with self-reported chronic physical and/or mental health conditions: panel survey of an adult sample in the United States. *Health and quality of life outcomes*, *10*(1), 154.

Bogdanici, C., Zavate, I., & Zavate, O. P. (2010). Quality of life in glaucoma patients. *Oftalmologia (Bucharest, Romania: 1990)*, *55*(1), 49-57.

Bourne, R. R., Stevens, G. A., White, R. A., Smith, J. L., Flaxman, S. R., Price, H., ... & Pesudovs, K. (2013). Causes of vision loss worldwide, 1990–2010: a systematic analysis. *The Lancet Global Health*, *1*(6), e339-e349.

Bowling, A. (2001). Measuring disease. Areview of disease-specific quality of life measurement scales. 2nd ed. UK, Open University Press.

Bowling, A. (2004). Quality of life for the elderly: the transport dimension. Transport Policy, 11(2), 105-115.

Bramley T, Peeples P, Walt JG, et al. Impact of vision loss on costs and outcomes in Brazier, E., Harper, R., Jones, N. M., O'Cathain, A., Thomas, K. J., Usherwood, T., & Westlake, L. (1992). Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *BMJ*, 305:160-164.

Budenz, D.L., et al., Prevalence of glaucoma in an urban West African population: the Tema Eye Survey. JAMA Ophthalmol, 2013. 131(5): p. 651-8.

Burr, JM, Mowatt, G, Hernandez, R, Siddiqui, MA, Cook, J, Lourenco, T, et al. (2007). The clinical effectiveness and cost-effectiveness of screening for open angle glaucoma: a systematic review and economic evaluation. *Health Technol Assess*, *11*(41), iii-iv, ix-x, 1-190.

Campbell, V., & Crews, J. (2001). Health conditions, activity limitations, and participation restrictions among older people with visual impairments. *Journal of Visual Impairment & Blindness*, *95*(8), 453-467.

Campos, A. C. V., e Ferreira, E. F., Vargas, A. M. D., & Albala, C. (2014). Aging, Gender and Quality of Life (AGEQOL) study: factors associated with good quality of

life in older Brazilian community-dwelling adults. *Health and quality of life outcomes*, *12*(1), 166.

Cassin, B., & Rubin, M. (Eds.). (2006) *Dictionary of Eye Terminology* (5th ed.). Gainesville, FL: Triad Publishing Company.

Chan, E. W., Chiang, P. P., Liao, J., Rees, G., Wong, T. Y., Lam, J. S., ... & Lamoureux, E. (2015). Glaucoma and associated visual acuity and field loss significantly affect glaucoma-specific psychosocial f unctioning. *Ophthalmology*, *122*(3), 494-501.

Chauhan BC, Mikelberg FS, Balaszi AG, Le- Blanc RP, Lesk MR & Trope GE (2008b): Canadian glaucoma study: 2. risk factors for the progression of open-angle glaucoma. Arch Ophthalmol 126: 1030–1036.

Cho, H.K. and C. Kee, Population-based glaucoma prevalence studies in Asians. Surv Ophthalmol, 2014. 59(4): p. 434-47.
control study. *Ophthalmology*, *117*(11), 2088-2095.

Courtney-Long, E. A., Carroll, D. D., Zhang, Q. C., Stevens, A. C., Griffin-Blake, S., Armour, B. S., & Campbell, V. A. (2015). Prevalence of disability and disability type among adults—United States, 2013. *MMWR Morb Mortal Wkly Rep*, *64*(29), 777-83.

Cummins, Robert A (1997) 'Assessing Quality of Life' in Brown, Roy (ed) Quality of Life for People with Disabilities. Models, Research and Practice, Cheltenham: Stanley Thornes (Publishers) Ltd

Cypel, M. C., Kasahara, N., Atique, D., Umbelino, C. C., Alcântara, M. P., Seixas, F. S., ... & Cohen, R. (2004). Quality of life in patients with glaucoma who live in a developing country. *International ophthalmology*, *25*(5-6), 267-272.

da Rocha, N. S., Schuch, F. B., & de Almeida Fleck, M. P. (2014). Gender differences in perception of quality of life in adults with and without chronic health conditions: The role of depressive symptoms. *Journal of health psychology*, *19*(6), 721-729.

Dahl, A. A. (2013). *Glaucoma*. Retrieved from http://www.medicinenet.com/glaucoma/article.htm

de Voogd S (2006): Is diabetes mellitus a risk factor for open angle glaucoma? The Rotterdam study Ophthalmology 113: 1827– 1831.

De Vries J, Drent M. (2006). In Baughman RP (ed.) Sarcoidosis Taylor & Francis, New York, pp. 463–478.

De Vries J. (2001). In: Vingerhoets AJJM (ed.) Assessment in Behavioural Medicine. Brunner-Routledge, Hove, UK, pp. 353–370.

Defining and measuring quality of life in medicine. *Jama*, *279*(6), 429-431.

Dempster, M. &Donnely, M. (2000). Selecting a measure of health-related quality of life. Social Work in Health Care, 32(1):45-56

DeSalvo, K. B., Bloser, N., Reynolds, K., He, J., & Muntner, P. (2006). Mortality prediction with a single general self-rated health question. *A meta-analysis. J Gen Intern Med*, 21(3):267-275.

Deshpande, N., Metter, E. J., Lauretani, F., Bandinelli, S., Guralnik, J., & Ferrucci, L. (2008). Activity restriction induced by fear of falling and objective and subjective measures of physical function: a prospective cohort study. *Journal of the American Geriatrics Society*, *56*(4), 615-620.

Dhull, (2015) http://eye.conferenceseries.com/speaker-ppts/2015/chand-singh-post-graduate-institute-of-medical-sciences-india.pptx.

Dijkers, M. (2005). Quality of life of individuals with spinal cord injury: A review of conceptualization, measurement, and research findings. *Journal of Rehabilitation Research and Development*, *42*(3), 87-102.

Dijkers, M. (2005). Quality of life of individuals with spinal cord injury: A review of conceptualization, measurement, and research findings. Journal of Rehabilitation Research and Development, 42(3):87-102.

Dominick, K. L., Ahern, F. M., Gold, C. H., & Heller, D. A. (2002). Relationship of health-related quality of life to health care utilization and mortality among older adults. *Aging Clin Exp Res*, 14(6):499-50.

Eljedi, A. (2005). Diabetes mellitus among the Palestinian refugee in Gaza Strip.Toward better quality of life.*PHD thesis*. Bielefeld University, Germany

Evans, K., Law, S. K., Walt, J., Buchholz, P., & Hansen, J. (2009). The quality of life impact of peripheral versus central vision loss with a focus on glaucoma versus age-related macular degeneration. *Clin ophthalmol*, *3*, 433-445.

Farquhar, M. (1995). Elderly people‟s definition of quality of life, social science and medicine.

Fayers PM, Aaronson NK, Bjordal K, Groenvold M, Curran D, Bottomley A on behalf of the EORTC Quality of Life Group. *EORTC QLQ-C30 Scoring Manual (3rd edition).* Brussels: EORTC, 2001.

Fechtner, R. D., Godfrey, D. G., Budenz, D., Stewart, J. A., Stewart, W. C., & Jasek, M. C. (2010). Prevalence of ocular surface complaints in patients with glaucoma using topical intraocular pressure-lowering medications. *Cornea*, *29*(6), 618-621

Felce, David (1997) 'Defining and Applying the Concept of Quality of Life', *Journa of Intellectual Disability Research*, Vol. 41, No. 2, pp126-135

Fenwick, E. K., Ong, P. G., Man, R. E. K., Cheng, C. Y., Sabanayagam, C., Wong, T. Y., & Lamoureux, E. L. (2016). Association of vision impairment and major eye diseases with mobility and independence in a chinese population. *JAMA ophthalmology*, *134*(10), 1087-1093.

Ferrans, C. (1996). Development of a conceptual model of quality of life. *Scholarly Inquiry for Nursing Practice Journal*, *10*(3), 293-304

Floriani, I., Quaranta, L., Rulli, E., Katsanos, A., Varano, L., Frezzotti, P., ... & Gandolfi, S. (2015). Health-related quality of life in patients with primary open-angle glaucoma. An Italian multicentre observational study. *Acta ophthalmologica.*

Foster PJ, Buhrmann R, Quigley HA, Johnson GJ. 2002. The definition and classification of glaucoma in prevalence surveys. British Journal of Ophthalmology 86(2):238-242.

Frank, L., Kleinman, L., Leidy, N. K., Legro, M., Shikiar, R., & Revicki, D. (1998).

Freeman, E. E., Muñoz, B., West, S. K., Jampel, H. D., & Friedman, D. S. (2008).

Friedman, D. S., Freeman, E., Munoz, B., Jampel, H. D., & West, S. K. (2007). Glaucoma and mobility performance: the salisbury eye evaluation project. *Ophthalmology*, *114*(12), 2232-2237.

Friedman, DS, Wolfs, RC, O'Colmain, BJ, Klein, BE, Taylor, HR, West, S, et al. (2004). Prevalence of open-angle glaucoma among adults in the United States. *Arch Ophthalmol*, *122*(4), 532-538.

Garatachea, N., Molinero, O., Martínez-García, R., Jiménez-Jiménez, R., González-Gallego, J., & Márquez, S. (2009). Feelings of wellbeing in elderly people: relationship to physical activity and physical function. *Archives of Gerontology and Geriatrics*, *48*(3), 306-312.

Giacaman, R. Khatib, R., Shabaneh, L. Ramlawi, A. Sabri, B. Sabatinelli, G. Khawaja,M. &Laurance, T. (2009). Health status and health services in the occupied Palestinian. Series, 373, 837-849.

Gill, T. M., & Feinstein, A. R. (1994). A critical appraisal of the quality of quality-of-life measurements. Jama, 272(8), 619-626.

Glaucoma and quality of life: the Salisbury Eye Evaluation. *Ophthalmology*, *115*(2), 233-238.

Glovinsky, Y., Quigley, H. A., Drum, B., Bissett, R. A., & Jampel, H. D. (1992). A whole-field scotopic retinal sensitivity test for the detection of early glaucoma damage. *Archives of Ophthalmology*, *110*(4), 486-490.

Goldberg I, Clement CI, Chiang TH, et al. Assessing quality of lifein patients with glaucoma using the Glaucoma Quality of Life-15(GQL-15) questionnaire. *J Glaucoma.* 2009;18:6 –12.

Habib, A. (2016) Assessment of Service Quality provided at Al Naser Ophthalmic Hospital. Un-published thesis: Al-Quds University. Palestine.

Hagerty, Michael R, Cummins, Robert A, Ferriss, Abbott L, Land, Kenneth, Michalos, Alex C, Peterson, Mark, Sharpe, Andrew, Sirgy, M Joseph, and Vogel, Joachim

(2001) 'Quality of Life Indexes for National Policy: Review and Agenda for Research', *Social Indicators Research*, Vol. 55, No. 1, pp1-96

Heijl A, Leske MC, Bengtsson B, Hyman L & Hussein M (2002): Reduction of intraocular pressure and glaucoma progression:results from the early manifest glaucoma trial. Arch Ophthalmol 120: 1268–1279.

Henslin, J. M. (2002). Sociology: A down-to-earth approach. Allyn& Bacon, Boston.

Hernandez MR. 2000. The optic nerve head in glaucoma: role of astrocytes in tissue remodeling. Progress in Retinal and Eye Research 19(3):297-321.

Hulsman CA, Houwing-Duistermaat JJ, Van Duijn CM, Wolfs R, Borger PH, Hofman A & De Jong PT (2002): Family score as an indicator of genetic risk of primary open-angle glaucoma. Arch Ophthalmol 120: 1726–1731.

Illarionova, A. R. (2002). Study of the quality of life in patients with glaucoma. *Vestnik oftalmologii*, *119*(3), 11-15

Iwase, A., et al., The prevalence of primary open-angle glaucoma in Japanese: the Tajimi

Jain, A., Sharma, R., Yadav, R., & Gaur, K. L. Quality of Life of Glaucoma Patients with its Socio-demographic and Clinical Associates.

Janz NK, Wren PA, Guire KE, Musch DC, Gillespie BW, Lichter PR for the Collaborative Initial Glaucoma Treatment Study (2007). Fear of Blindness in the Collaborative Initial Glaucoma Treatment Study: patterns and correlates over time. Ophthalmology; (114) 12: 2213-2220.

Janz, N. K., Wren, P. A., Lichter, P. R., Musch, D. C., Gillespie, B. W., & Guire, K. E. (2001). Quality of life in newly diagnosed glaucoma patients: The Collaborative Initial Glaucoma Treatment Study. *Ophthalmology*, *108*(5), 887-897

Johnson EC, Morrison JC, Farrell S, Deppmeier L, Moore CG, McGinty MR. 1996. The Effect of Chronically Elevated Intraocular Pressure on the Rat Optic Nerve Head Extracellular Matrix. Experimental Eye Research 62(6):663-674.

Jung, K. I., & Park, C. K. (2016). Mental Health Status and Quality of Life in Undiagnosed Glaucoma Patients: A Nationwide Population-Based Study. *Medicine, 95*(19).

Karen, L., Kevin T., Fred B., Domenic J., Margaret M., Denise M. (2008). Comparison of health-related quality of life measures for chronic renal failure: quality of well-being scale, short form 6D, and kidney disease quality of life instrument. *Qual. Life Res., 17*(8), 1103-1115**.**

Kass MA, Heuer DK, Higginbotham EJ et al. (2002): The ocular hypertension treatment study: a randomized trial determines that topical ocular hypotensive medication delays or prevents the onset of primary open-angle glaucoma. Arch Ophthalmol 120: 701–713. discussion 829–30.

Kaštelan, S., Tomić, M., Metež Soldo, K., & Salopek-Rabatić, J. (2013). How ocular surface disease impacts the glaucoma treatment outcome. *BioMed research international, 2013*.

Keith, Kenneth D (2001) 'International Quality of Life: Current Conceptual, Measurement, and Implementation Issues' in Glidden, Laraine Masters (ed) International Review of Research in Mental Retardation 24, San Diego: Academic Press

Kong, X. M., Zhu, W. Q., Hong, J. X., & Sun, X. H. (2014). Is glaucoma comprehension associated with psychological disturbance and vision-related quality of life for patients with glaucoma? A cross-sectional study. *BMJ open, 4*(5), e004632.

Kuyk, T., Elliott, J. L., & Fuhr, P. S. (1998). Visual correlates of mobility in real world settings in older adults with low vision. *Optometry & Vision Science, 75*(7), 538-547.

LabirisG, KatsanosA, Fanariotis M, Zacharaki F, ChatzoulisD, KozobolisVP (2010). Vision-specific quality of life in Greek glaucoma patients. J Glaucoma; 19: 39-43.

Lee PP, Walt JG, Doyle JJ, et al. A multicenter, retrospective pilot study of resource use and costs associated with severity of disease in glaucoma. *Arch Ophthalmol.*2006;124(1):12-19

Lee, J. W., Chan, C. W., Chan, J. C., Li, Q., & Lai, J. S. (2014). The association between clinical parameters and glaucoma-specific quality of life in Chinese primary open-angle glaucoma patients. *Hong Kong Medical Journal*.

Leplege, A., & Hunt, S. (1997). The problem of quality of life in medicine. *Jama*, *278*(1), 47-50.

Leske MC, Connell AM, Schachat AP & Hyman L (1994): The Barbados eye study. Prevalence of open angle glaucoma. Arch Ophthalmol 112: 821–829.

Leske MC, Wu SY, Hennis A, Honkanen R & Nemesure B (2008): Risk factors for incident open-angle glaucoma: the Barbados eye studies. Ophthalmology 115: 85–93.

Leung, E. W., Medeiros, F. A., & Weinreb, R. N. (2008). Prevalence of ocular surface disease in glaucoma patients. *Journal of glaucoma*, *17*(5), 350-355.

Lichter PR, Musch DC, Gillespie BW, Guire KE, Janz NK, Wren PA & Mills RP (2001): Interim clinical outcomes in the collaborative initial glaucoma treatment study comparing initial treatment randomized to medications or surgery. Ophthalmology 108: 1943–1953.

Lim, N., Fan, C. H., Yong, M. K., Wong, E. P., & Yip, L. W. (2016). Assessment of Depression, Anxiety, and Quality of Life in Singaporean Patients With Glaucoma. *Journal of glaucoma*, *25*(7), 605-612.

Lin, H. C., Chien, C. W., Hu, C. C., & Ho, J. D. (2010). Comparison of comorbid conditions between open-angle glaucoma patients and a control cohort: a case-

Loon, S. C., Jin, J., & Goh, M. J. (2015). The relationship between quality of life and adherence to medication in glaucoma patients in Singapore. *Journal of glaucoma*, *24*(5), e36-e42.

Lotery A, Xu X, Zlatava G, Loftus J. Burden of illness, visual impairment and healthresource utilisation of patients with neovascular age-related macular degeneration: results from the UK cohort of a five-country cross-sectional study. Br J Ophthalmol.2007;91(10):1303–1307.

Luzon, F. (2008). Quality of Life among rehabilitated stroke survivors in Gaza Strip. Unpublished thesis: The Islamic University of Gaza. Palestine.

Mabuchi, F., Yoshimura, K., Kashiwagi, K., Shioe, K., Yamagata, Z., Kanba, S., ... & Tsukahara, S. (2008). High prevalence of anxiety and depression in patients with primary open-angle glaucoma. *Journal of glaucoma*, *17*(7), 552-557.

Macduff, C. (2000). Respondent-generated quality of life measures: useful tools for nursing or more fool's gold?. *Journal of advanced nursing*, *32*(2), 375-382.

Macionis, J. J. (2003). *Sociology*. Prentice Hall, Upper Saddle River.

Magacho L, Lima FE, Nery ACS, Sagawa A, Magacho B, Avila MP. (2004). Quality of life in Glaucoma patients: regression analysis and correlation with possible modifiers. Ophthalmic Epidemiol; 11: 263-270.

Mangione CM, Lee PP, Pitts J, Gutierrez P, Berry S, Hays RR (2001). The NEIVFQ Field Test Investigators. Development of the 25-item National Eye Institute Visual Function Questionnaire (NEIVFQ). Arch Ophthal.;119(7):1050–1058.

Mangione, C. M., Berry, S., Spritzer, K., Janz, N. K., Klein, R., Owsley, C., & Lee, P. P. (1998). Identifying the content area for the 51-item National Eye Institute Visual Function Questionnaire: results from focus groups with visually impaired persons. *Archives of Ophthalmology*, *116*(2), 227-233.

McGwin, G., Xie, A., Mays, A., Joiner, W., DeCarlo, D. K., Hall, T. A., & Owsley, C. (2005). Visual field defects and the risk of motor vehicle collisions among patients with glaucoma. *Investigative ophthalmology & visual science*, *46*(12), 4437-4441

McKean-Cowdin, R., Wang, Y., Wu, J., Azen, S. P., Varma, R., & Los Angeles Latino Eye Study Group. (2008). Impact of visual field loss on health-related quality of life in glaucoma: the Los Angeles Latino Eye Study. *Ophthalmology*, *115*(6), 941-948.

Mills RP (1998). Correlation of QOL with clinical symptoms and signs at the time of glaucoma diagnosis. Tr Am Ophth Soc.

Ministry of Health (2011a). *Hospitals annual report, GS 2011*. MOH, Gaza, Palestine.Ministry of Health (2014). Health Sector Strategic Plan: Gaza Governorates 2014-2018. Gaza: Palestine.

Ministry of Health. 2012. General Administration of Hospitals http://www.moh.gov.ps/hos/?author=1&paged=105. [Electronically Accessed article 11th April 2016].

Molassiotis A., Callaghan, S. F. &Twinn, S. W. (2001). Correlates of quality of life in symptomatic HIV patients living in Hong Kong. AIDS Care, 13(3):319-334.

Moons, P., Budts, W., & De Geest, S. (2006). Critique on the conceptualisation of quality of life: a review and evaluation of different conceptual approaches. *International journal of nursing studies*, *43*(7), 891-901.

National Institute for Health and Care Excellence (2009) *Glaucoma: Diagnosis and Management of Chronic Open Angle Glaucoma and Ocular Hypertension.* nice.org.uk/CG85

Naveen, B., VK, S., Pai, M., & Shilpa, N. (2014). Assessing Quality of Life in Patients with Glaucoma Using the Glaucoma Quality of Life-15 (GQL-15) Questionnaire in Indian eyes. *International Journal of Health Sciences and Research (IJHSR)*, *4*(3), 89-96

Nelson P, Aspinall P, Papasouliotis O, Worton B, O'Brien C. Qualityof life in glaucoma and its relationship with visual function. *JGlaucoma.* 2003; 12:139–150. Nelson P, Aspinall PA, O'Brien C. Patients' perception of visualimpairment in glaucoma: a pilot study. *Br J Ophthalmol.* 1999; 83:546–552.

Nelson, P., Aspinall, P., & O'Brien, C. (1999). Patients' perception of visual impairment in glaucoma: a pilot study. *British Journal of Ophthalmology*, *83*(5), 546-552.

Nguyen, A. M., Arora, K. S., Swenor, B. K., Friedman, D. S., & Ramulu, P. Y. (2015). Physical activity restriction in age-related eye disease: a cross-sectional study exploring fear of falling as a potential mediator. *BMC geriatrics*, *15*(1), 64.

Nordmann, J. P., Auzanneau, N., Ricard, S., & Berdeaux, G. (2003). Vision related quality of life and topical glaucoma treatment side effects. *Health and quality of life outcomes*, *1*(1), 75.

Nutheti, R., Shamanna, B. R., Nirmalan, P. K., Keeffe, J. E., Krishnaiah, S., Rao, G. N., & Thomas, R. (2006). Impact of impaired vision and eye disease on quality of life in Andhra Pradesh. *Investigative ophthalmology & visual science*, *47*(11), 4742-4748.

O'Connor, R. (2004). Measuring quality of life in health. London. Churchill Livingstone.

Odberg, T., Jakobsen, J. E., Hultgren, S. J., & Halseide, R. (2001). The impact of glaucoma on the quality of life of patients in Norway. *Acta Ophthalmologica*, *79*(2), 116-120.

Omoti AE, Waziri-Erameh MJM, Osahon AJ (2002). The relationship between socio demographic factors and severity of visual field loss in glaucoma patients at initial presentation in Benin City Nigeria. Sahel Medical Journal; 5 (4):195-198.

Onakoya, A. O., Mbadugha, C. A., Aribaba, O. T., &Ibidapo, O. O. (2012). Quality of life of primary open angle glaucoma patients in lagos, Nigeria: clinical and sociodemographic correlates. Journal of glaucoma, 21(5), 287-295.

Ophthalmic Vis Sci; 52: 7007–7011.

Orta, A. Ö., Öztürker, Z. K., Erkul, S. Ö., Bayraktar, Ş., & Yilmaz, O. F. (2015). The correlation between glaucomatous visual field loss and vision-related quality of life. *Journal of glaucoma*, *24*(5), e121-e127.

Pais-Ribeiro , J. L. (2004). Quality of life is a primary end-point in clinical settings. *Clinical nutrition*, *23*(1), 121-130.

Palestinian Central Bureau of Statistics. (2011).

Palestinian Central Bureau of Statistics. (2016). Palestine in figures 2015. Ramallah. Palestine.

Palestinian Non-Governmental Organizations Network. (2009). Priorities and Needs of Health Sector in GazaGovernorates: Consequences of the Long Siege and theLast War on Gaza. Workshop held at Palestinian ministryof health. Gaza: Palestine.

Palestinian Water Authority (2013). Water Quality in the Gaza Strip Municipal Wells. Gaza: Palestine.

Parrish RK, 2nd (1996). Visual Impairment, visual functioning and quality of life assessments in patients with glaucoma. Trans Am Ophthalmol Soc. 94: 919-1028.

Patel, S. (2006). Quality of life in patients with chronic kidney disease: Focus on end-stage renal disease treated with hemodialysis. *Seminars in Nephrology*, *26*(1), 68-79

Patient.co.uk (2014) *Primary Open-angle Glaucoma.* tinyurl.com/Patient Glaucoma.

Patients have two eyes! : binocular versus better eye visual field indices. Invest

Pennacchini, M., Bertolaso, M., Elvira, M. M., & De Marinis, M. G. (2011). A brief history of the Quality of Life: its use in medicine and in philosophy. Clinical Terminology, 162(3), e99-e103.

Pinar R, Salepci T, Afsar F. Assessment of quality of life in Turkish patients with cancer. *Turkish Journal of Cancer*. 2003;33(2):96–101.

Qiu, M., Wang, S. Y., Singh, K., & Lin, S. C. (2014). Association between visual field defects and quality of life in the United States. *Ophthalmology*, *121*(3), 733- 740.

Quigley et al. Br J Ophthalmol 2006; 90:262-267

Quigley HA, Broman AT (2006) The number of people with glaucoma worldwide in 2010 and 2020. Br J Ophthalmol 90:262–267

Quigley HA, Broman AT. 2006. The number of people with glaucoma worldwide in 2010and 2020. British Journal of Ophthalmology 90(3):262-267.

Quigley HA, Broman AT. The number of people with glaucomaworldwide in 2010 and 2020. *Br J Ophthalmol.* 2006;90:262–267.

Quigley HA. 2011. Glaucoma. Lancet 377(9774):1367-1377.

Ramrattan, RS, Wolfs, RC, Panda-Jonas, S, Jonas, JB, Bakker, D, Pols, HA, et al. (2001). Prevalence and causes of visual field loss in the elderly and associations with impairment in daily functioning: the Rotterdam Study. *Arch Ophthalmol, 119*(12), 1788-1794.

Ramulu, P. (2009). Glaucoma and disability: which tasks are affected, and at what stage of disease?. *Current opinion in ophthalmology*, *20*(2), 92.

Ramulu, P. Y., Van Landingham, S. W., Massof, R. W., Chan, E. S., Ferrucci, L., & Friedman, D. S. (2012). Fear of falling and visual field loss from glaucoma. *Ophthalmology*, *119*(7), 1352-1358.

Raphael, D., Brown, I., Renwick, R., &Rootman, I. (1996). *Quality of life Indicators and Health: Current Status and Emerging Conceptions.* Center for Health Promotion, University of Toronto,Toronto, Canada

Rein DB, Zhang P, Wirth KE, et al. The economic burden of major adult visual disorders in the United States. Arch Ophthalmol. 2006;124(12):1754–1760.

Ribeiro, M. V. M. R., Júnior, H. R., Nogueira, H., Ribeiro, E. A. N., Jucá, M. J., Barbosa, F. T., & Sousa-Rodrigues, C. F. D. (2015). Association between visual impairment and depression in the elderly: a systematic review. *Arquivos brasileiros de oftalmologia*, *78*(3), 197-201.

Robin, A., & Grover, D. S. (2011). Compliance and adherence in glaucoma management. *Indian journal of ophthalmology*, *59*(7), 93.

Rossi, G. C., Tinelli, C., Pasinetti, G. M., Milano, G., & Bianchi, P. E. (2008). Dry eye syndrome-related quality of life in glaucoma patients. *European journal of ophthalmology*, *19*(4), 572-579

Rotchford, A. P., & Murphy, K. M. (1998). Compliance with timolol treatment in glaucoma. *Eye*, *12*(2), 234-236.

s Oluleye, T. (2014). Quality of life in patients with visual impairment in Ibadan: a clinical study in primary care. *Journal of multidisciplinary healthcare*, *7*, 173-178.

Sato, T., & Smith W. E. (1996). *The new development paradigm: Organizing for implementation*. In Griesgraber, J. M. & Gunter, B. G. (eds.): Development: new paradigms and principles for the twenty-first century. Pluto, London. (p. 89-102).

Schalock, R. (2004). The concept of quality of life: What we know and do not know. *Journal of Intellectual Disability Research*, 48(3):203-216.

Schalock, Robert L (2000) 'Three Decades of Quality of Life', *Focus on Autism & Other Developmental Disabilities*, Vol. 15, No. 2, pp116-127

Schuman, J. S. (2008). Spectral domain optical coherence tomography for glaucoma (an AOS thesis). *Transactions of the American Ophthalmological Society*, *106*, 426.

Shields, MB. (2008). Normal-tension glaucoma: is it different from primary open-angle glaucoma? *CurrOpinOphthalmol*, *19*(2), 85-88.

Skalicky, S. E., Goldberg, I., & McCluskey, P. (2012). Ocular surface disease and quality of life in patients with glaucoma. *American journal of ophthalmology*, *153*(1), 1-9.

Skalicky, S. E., Martin, K. R., Fenwick, E., Crowston, J. G., Goldberg, I., & McCluskey, P. (2015). Cataract and quality of life in patients with glaucoma. *Clinical & experimental ophthalmology*, *43*(4), 335-341.

Skalicky, S., & Goldberg, I. (2008). 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, 17(7), 546-551.

Spaeth, G., Walt, J., & Keener, J. (2006). Evaluation of quality of life for patients with glaucoma. *American Journal of Ophthalmology*, *141*(1), 3-14. doi: 10.1016/j.ajo.2005.07.075

Stark, R., & Roberts, L. (2002). *Contemporary social research methods*. Wadsworth/Thomson, Belmont, CA.

Study. Ophthalmology, 2004. 111(9): p. 1641-8.

Sung, K. R., Chun, Y. S., Park, C. K., Kim, H. K., Yoo, C., Kim, Y. Y., ... & Han, S. (2017). Vision-related Quality of Life in Korean Glaucoma Patients. *Journal of Glaucoma*.

Tastan, S., Iyigun, E., Bayer, A., & Acikel, C. (2010). Anxiety, depression, and quality of life in Turkish patients with glaucoma. *Psychological reports*, *106*(2), 343-357.

Tham, Y. C., Li, X., Wong, T. Y., Quigley, H. A., Aung, T., & Cheng, C. Y. (2014). Global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. Ophthalmology, 121(11), 2081-2090.

The WHOQOL Group (1995) 'The World Health Organization Quality of Life Assessment (WHOQOL): Position Paper From the World Health Organization', *Social Science and Medicine*, Vol. 41, No. 10, pp1403-1409

Tielsch J et al (1994) Family history and risk of primary open angle glaucoma. The Baltimore Eye Survey. *Archives of Ophthalmology;* 112: 1, 69-73.

Tran HM, Mahdi AM, Sivasubramaniam S, Gudlavalleti MVS, Gilbert CE, Shah SP, Ezelum CC, Abubakar T, Bankole OO on behalf of the Nigerian National Blindness & Visual Impairment Study Group. (2011) Quality of Life & visual function in Nigeria: findings from the National Survey of Blindness & Visual Impairment. Br J Ophthalmol; 95: 1646-1651.

Turano, K. A., Rubin, G. S., & Quigley, H. A. (1999). Mobility performance in glaucoma. *Investigative Ophthalmology & Visual Science, 40*(12), 2803-2809.

Tüzün, H., Aycan, S., & Ilhan, M. N. (2015). Impact of Comorbidity and Socioeconomic Status on Quality of Life in Patients with Chronic Diseases Who Attend Primary Health Care Centres. *Central European journal of public health*, *23*(3), 188.

Ugurlu, S. K., Altundal, A. K., & Ekin, M. A. (2016). Comparison of vision-related quality of life in primary open-angle glaucoma and dry-type age-related macular degeneration. *Eye*.

vanGestel A, Webers CA, Beckers HJ, van Dongen MC, Severens JL, Hendrikse F, Schouten JS (2010). The relationship between visual field loss in glaucoma and health-related quality-of-life. Eye (Lond);24: 1759-69.

Varma, R., Lee, P. P., Goldberg, I., & Kotak, S. (2011). An assessment of the health and economic burdens of glaucoma. *American journal of ophthalmology*, *152*(4), 515-522.

Velikova, G., Booth, L., Smith, A. B., Brown, P. M., Lynch, P., Brown, J. M., & Selby, P. J. (2004). Measuring quality of life in routine oncology practice improves communication and patient well-being: a randomized controlled trial. *Journal of Clinical Oncology*, *22*(4), 714-724.

Ventegodt, S., Merrick, J., & Andersen, N. J. (2003). Measurement of quality of life III. From the IQOL theory to the global, generic SEQOL questionnaire. *The Scientific World Journal*, *3*, 972-991.

Viswanathan, A. C., McNaught, A. I., Poinoosawmy, D., Fontana, L., Crabb, D. P., Fitzke, F. W., & Hitchings, R. A. (1999). Severity and stability of glaucoma: patient perception compared with objective measurement. *Archives of Ophthalmology*, *117*(4), 450-454.

Walt JG Rendas-Baum R Kosinski M Vaishali PP . Psychometric evaluation of the Glaucoma Symptom Identifier. *J Glaucoma*. 2011;20:148–159

Wändell, P. E., Lundström, M., Brorsson, B., & Åberg, H. (1997). Quality of life among patients with glaucoma in Sweden. *Acta Ophthalmologica Scandinavica*, *75*(5), 584-588.

Ware, J. E. &Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. conceptual framework and item selection. *Medical Care,* 30:473-483

Ware, J. E. (1993). *SF-36 health survey: manual and interpretation guide*. The Health Institute, New England Medical Center.

Warrian KJ, Spaeth GL, Lankaranian D, Lopes JF, Steinmann WC (2009). The effect of personality on measures of QOL related to vision in glaucoma patients. Br J Ophthalmol; 93 (3): 310-315.

Weih, LM, VanNewkirk, MR, McCarty, CA, & Taylor, HR. (2000). Age-specific causes of bilateral visual impairment. *Arch Ophthalmol*, *118*(2), 264-269.

Whoqol Group. (1995). The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. *Social science & medicine*, *41*(10), 1403-1409.

Wiklund, I., Sorkness, C., & Burckhardt. (2000). *Measuring quality of life.* Center for Quality of Life Research in Nursing Science, Section for Nursing Science, Department of Public Health and Primary Health Care, University of Bergen.

Wiley, J., Sons, L., and Walters, S. (2009). Quality of Life Outcomes in Clinical Trials and Health-Care Evaluation

Wilson, M. R., Coleman, A. L., Yu, F., Bing, E. G., Sasaki, I. F., Berlin, K., ... & Lai, A. (1998). Functional status and well-being in patients with glaucoma as measured by

the Medical Outcomes Study Short Form-36 questionnaire. *Ophthalmology*, *105*(11), 2112-2116

Wittenborn J, Rein D (2011) Cost-effectiveness of glaucoma interventions in Barbados and Ghana. Optometry and Vision Science; 88: 1, 155-163.

Wood-Dauphinee S. Assessing Quality of Life in Clinical Research From Where Have We Come and Where Are We Going?. J Clin Epidemiol 1999; 52 (4):355-63

Woods R, Gardner Re, Ferachi KA, King C, Ermolao A, Cherry KE, Cress ME, Jazwinski SM (2005). Physical function & Quality of life in older adults: sex differences. Southern Medical Journal; 98 (5), 504-512.

World Health Organization.(2012) *Introduction the WHOQOL Instrument* .Genva:WHO

Wu SY, Hennis A, Nemesure B, Leske MC; Barbados Eye Studies Group (2008). Impact of glaucoma, lens opacities, and cataract surgery onvisual functioning and related quality of life: the Barbados Eye Studies. Invest Ophthalmol Vis Sci; 49: 1333- 1338.

Wu, P., Xi, S., Xia, H., Lu, H., & Guo, W. (2014). Survey on vision-related quality of life and self-management among patients with glaucoma. *Journal of glaucoma*, *23*(2), 75-80.

Zhou, C., Qian, S., Wu, P., & Qiu, C. (2014). Quality of life of glaucoma patients in China: sociodemographic, clinical, and psychological correlates—a cross-sectional study. *Quality of Life Research*, *23*(3), 999-1008.

Zuo, L., Zou, H., Zhang, J., Fei, X., & Xu, X. (2015). Vision health-related quality of life in Chinese glaucoma patients. *Journal of ophthalmology*, *2015*

## Annex (1): Map of Palestine

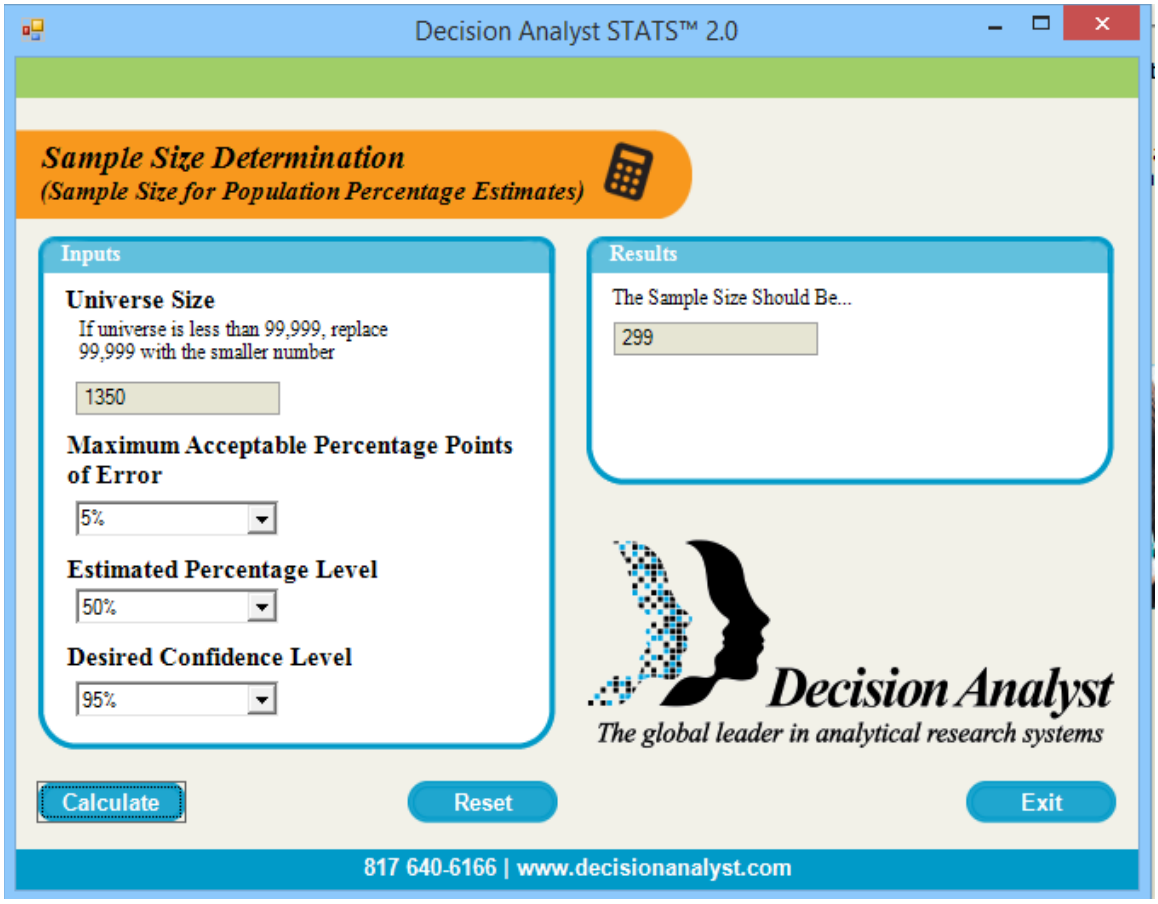
## Annexes (2) QOL domains

| Felce (1996) | Schalock (2000), p.118 | World Health Organization QOL definition (1993) | Hagerty et al (2001), pp. 74-75 | Cummins (1997) |
|---|---|---|---|---|
| Disability/Psychology | Disability/Psychology | Health | Social indicators research | Disability |
| 6 possible domains: | 8 core domains: | 6 domains: | 7 core domains: | 7 core domains: |
| Physical well-being | Physical well-being | Physical | Health | Health |
| Material well-being | Material well-being | Environment | Material well-being | Material well-being |
| Social well-being | Social inclusion | Social relationships | Feeling part of one's local community | Community well-being |
| Productive well-being | | | Work and productive activity | Work/ Productive activity |
| Emotional well-being | Emotional well-being | Psychological | Emotional well-being | Emotional well-being |
| Rights or civic well-being | Rights | | | |
| | Inter-personal relations | | Relationships with family and friends | Social/family connections |
| | Personal development | | | |
| | Self-determination | Level of independence | | |
| | | Spiritual | | |
| | | | Personal safety | Safety |

# Annexes (3) QOL Assessment Tools for Glaucoma

| Questionnaire | Overview | Use in Glaucoma Patients |
|---|---|---|
| **General Health-related** | | |
| SIP | 136 items in 12 categories; good validity with moderate-to-high correlations with clinical measures of disease. | Modified version used in the Collaborative initial glaucoma treatment study (CIGTS); good internal consistency (Cronbach $\alpha$ = 0.962) and test-retest reliability (r = 0.908), however weak correlation of QoL scores and clinical outcomes. |
| SF-36/MOS-20 | The SF-36 is a widely used 36-item general health questionnaire over eight domains. The Medical outcomes Study (MOS-20) is a shortened version. | Scores were low in glaucoma patients, higher in controls and intermediate in glaucoma suspects. Poor correlation with visual field indices. |
| **Vision-Specific** | | |
| ADVS | 20-item questionnaire in five subscale domains (distance vision, near vision, glare, night driving, daytime driving). High test-retest reliability (r = 0.87) and internal consistency (Cronbach $\alpha$ = 0.94). | Scores correlated with field loss in glaucoma patients and were significantly better in controls. |
| VF-14 | A 14-item questionnaire with high internal consistency; good correlation with pre-operative visual acuity and patient satisfaction in cataract patients. | Moderate correlation between scores and glaucomatous field loss (r = -0.56 to -0.6); no difference detected between patients with glaucoma and healthy controls. |
| VAQ | 33-items over 10 domains related to visual function: peripheral vision, contrast sensitivity, acuity, glare, low-illumination levels, and light/dark adaptation. | Used in the CIGTS with high internal consistency (Cronbach $\alpha$ = 0.958) and test-retest reliability (r = 0.932). Peripheral vision subscale scores highly correlated with visual field loss ($p < 0.001$). |
| NEI-VFQ | A 51-item instrument used in many ocular conditions to assess vision-dependent function and quality of life. A 25-item short form has a similar validity. Commonly used vision-specific QoL assessment tool in clinical trials. | Scores for most domains correlate with visual field loss, especially in the better eye. |
| **Glaucoma-Specific** | | |
| GSS | A 10-item checklist of non-visual and visual symptoms common in patients with glaucoma. High internal consistency for the nonvisual symptom and visual ability subscales (Cronbach $\alpha$ = 0.83 and 0.74, respectively). | Patients with glaucoma had significantly lower scores than normal subjects on both the nonvisual symptom and visual ability subscales of the GSS. |
| GQL-15 | A 15-item subscale related to central/near vision, darkness/glare, mobilising, cooking/cleaning/self-care, and peripheral vision. Items were chosen based on correlation with severity of visual field loss. | Well validated with high internal consistency and test-retest reliability. |
| **Utility Value Assessments** | | |
| TTO | Patients are asked how much life span to trade for perfect vision. | Poor sensitivity to early glaucoma; sensitive to glaucomatous progression. |
| Conjoint analysis | Patients rank various visual attributes as to how important they are to them. | Poor correlation to other QoL measures including time trade off. |

## Annexes (4) Sample of the study



# Annexes (5) SF-36 Questionnaire

**SF36 Health Survey**

**INSTRUCTIONS:** This set of questions asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Answer every question by marking the answer as indicated. If you are unsure about how to answer a question please give the best answer you can.

1. In general, would you say your health is: (Please tick **one** box.)
   - Excellent ☐
   - Very Good ☐
   - Good ☐
   - Fair ☐
   - Poor ☐

2. Compared to one year ago, how would you rate your health in general now? (Please tick **one** box.)
   - Much better than one year ago ☐
   - Somewhat better now than one year ago ☐
   - About the same as one year ago ☐
   - Somewhat worse now than one year ago ☐
   - Much worse now than one year ago ☐

3. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? **(Please circle one number on each line.)**

| | Activities | Yes, Limited A Lot | Yes, Limited A Little | Not Limited At All |
|---|---|---|---|---|
| 3(a) | **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports | 1 | 2 | 3 |
| 3(b) | **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf | 1 | 2 | 3 |
| 3(c) | Lifting or carrying groceries | 1 | 2 | 3 |
| 3(d) | Climbing **several** flights of stairs | 1 | 2 | 3 |
| 3(e) | Climbing **one** flight of stairs | 1 | 2 | 3 |
| 3(f) | Bending, kneeling, or stooping | 1 | 2 | 3 |
| 3(g) | Waling **more than a mile** | 1 | 2 | 3 |
| 3(h) | Walking **several blocks** | 1 | 2 | 3 |
| 3(i) | Walking **one block** | 1 | 2 | 3 |
| 3(j) | Bathing or dressing yourself | 1 | 2 | 3 |

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

| | **(Please circle one number on each line.)** | Yes | No |
|---|---|---|---|
| 4(a) | Cut down on the **amount of time** you spent on work or other activities | 1 | 2 |
| 4(b) | Accomplished less than you would like | 1 | 2 |
| 4(c) | Were **limited** in the **kind** of work or other activities | 1 | 2 |
| 4(d) | Had **difficulty** performing the work or other activities (for example, it took extra effort) | 1 | 2 |

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (e.g. feeling depressed or anxious)?

| | **(Please circle one number on each line.)** | Yes | No |
|---|---|---|---|
| 5(a) | Cut down on the **amount of time** you spent on work or other activities | 1 | 2 |
| 5(b) | Accomplished less than you would like | 1 | 2 |
| 5(c) | Didn't do work or other activities as **carefully** as usual | 1 | 2 |

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups? (Please tick **one** box.)

- ☐ Not at all
- ☐ Slightly
- ☐ Moderately
- ☐ Quite a bit
- ☐ Extremely

7. How much physical pain have you had during the past 4 weeks? (Please tick **one** box.)

- ☐ None
- ☐ Very mild
- ☐ Mild
- ☐ Moderate
- ☐ Severe
- ☐ Very Severe

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? (Please tick **one** box.)

- ☐ Not at all
- ☐ A little bit
- ☐ Moderately
- ☐ Quite a bit
- ☐ Extremely

9. These questions are about how you feel and how things have been with you during the past 4 weeks. Please give the one answer that is closest to the way you have been feeling for each item.

| | **(Please circle one number on each line.)** | **All of the Time** | **Most of the Time** | **A Good Bit of the Time** | **Some of the Time** | **A Little of the Time** | **None of the Time** |
|---|---|---|---|---|---|---|---|
| 9(a) | Did you feel full of life? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(b) | Have you been a very nervous person? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(c) | Have you felt so down in the dumps that nothing could cheer you up? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(d) | Have you felt calm and peaceful? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(e) | Did you have a lot of energy? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(f) | Have you felt downhearted and blue? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(g) | Did you feel worn out? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(h) | Have you been a happy person? | 1 | 2 | 3 | 4 | 5 | 6 |
| 9(i) | Did you feel tired? | 1 | 2 | 3 | 4 | 5 | 6 |

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives etc.) (Please tick **one** box.)

- ☐ All of the time
- ☐ Most of the time
- ☐ Some of the time
- ☐ A little of the time
- ☐ None of the time

11. How TRUE or FALSE is each of the following statements for you?

| | **(Please circle one number on each line.)** | **Definitely True** | **Mostly True** | **Don't Know** | **Mostly False** | **Definitely False** |
|---|---|---|---|---|---|---|
| 11(a) | I seem to get sick a little easier than other people | 1 | 2 | 3 | 4 | 5 |
| 11(b) | I am as healthy as anybody I know | 1 | 2 | 3 | 4 | 5 |
| 11(c) | I expect my health to get worse | 1 | 2 | 3 | 4 | 5 |
| 11(d) | My health is excellent | 1 | 2 | 3 | 4 | 5 |

**Thank You!**

# SF-36 Arabic version

**استبيان لتقييم جودة الحياة لدى مرضى الجلوكوما في قطاع غزة**

**أحوال الشخصية:**

نود منك الإجابة على بعض الأسئلة العامة عن نفسك:

1- **الجنس** □ ذكر □ انثى

2- **العمر** □18-30 سنة □ 31-40 سنة □41 فأكثر

3- **الدرجة العلمية** □ أميّ □ المرحلة الأساسية □ المرحلة الثانوية □ جامعي

4- **الحالة الاجتماعية** □ أعزب □ متزوج □ غير ذلك

5- **المحافظة** □ الشمال □ غزة □ الوسطى □ خانيونس □ رفح

6- **مكان تلقي الخدمة** □ مستشفى العيون □ مستشفى الاوروبي

7- **العمل** □ يعمل □ لا يعمل

8- **الدخل الشهري** □ اقل من 1000 شيكل □ 1000-2000 شيكل □ أكثر من 2000 شيكل

9- **نوع مرض الجلوكوما** □ مفتوح الزاوية □ مغلق الزاوية □خلقية (منذ الولادة)

10- **هل انت مصاب بأي مرض عيون آخر** □ نعم □ لا

11- **هل أنت مصاب بأي مرض مزمن** □ نعم □ لا

12- **مدة المرض** □ أقل من 5 سنوات □ 5-10 سنوات □ 10 سنوات فأكثر

13 – **مدى الالتزام بالعلاج** □ ملتزم □ قليل الالتزام □ غير ملتزم

**من فضلك أجب على كل الأسئلة في هذا الاستبيان. في حالة عدم وضوح أي سؤال، أرجو اختيار أقرب اجابة لمفهومك للسؤال.** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الاجابة الصحيحة)

| | | | | | |
|---|---|---|---|---|---|
| ١ | **بصورة عامة، كيف ترى حالتك الصحية؟** | | | | |
| | ١- ممتازة | ٢- جيدة جداً | ٣- جيدة | ٤- لا بأس بها | ٥- سيئة |

| | | | |
|---|---|---|---|
| 2 | **مقارنة بعام مضى، كيف تقيم حالتك الصحية الان بصورة عامة:** | | |
| | ١- أفضل بكثير مما كانت عليه قبل عام | ٢- أفضل نوعاً ما من العام الماضي | |
| | ٣- تقريباً على ما هي عليه | ٤- أسوء نوعا ما من العام الماضي | ٥- أسوء بكثير مما كانت عليه قبل عام |

| **تتعلق البنود التالية بأنشطة يمكن أن تقوم بها خلال يومك العادي. في الوقت الحالي، إلى أي مدى تقيدك حالتك الصحية؟** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح) | **نعم تقيدني كثيراً** | **نعم تقيدني قليلاً** | **لا تقيدني إطلاقاً** |
|---|---|---|---|
| ٣- من ممارسة الأنشطة الشاقة مثل: الجري، حمل الأشياء الثقيلة أو مزاولة الأنشطة الرياضية المجهدة جداً؟ | ١ | ٢ | ٣ |
| ٤- من ممارسة الأنشطة متوسطة الجهد، كتحريك الطاولة أو التنظيف باستخدام المكنسة الكهربائية أو تنظيف حديقة المنزل والعناية بها؟ | ١ | ٢ | ٣ |
| ٥- من حمل المشتريات من البقالة أو السوق المركزي؟ (السوبرماركت)؟ | ١ | ٢ | ٣ |
| ٦- من صعود الدرج لعدة أدوار؟ | ١ | ٢ | ٣ |
| ٧- من صعود الدرج لدور واحد فقط؟ | ١ | ٢ | ٣ |
| ٨- من الانحناء أو الركوع أو السجود؟ | ١ | ٢ | ٣ |
| ٩- من المشي لأكثر من كيلو متر ونصف؟ | ١ | ٢ | ٣ |
| ١٠- من المشي لمسافة نصف كيلو متر؟ | ١ | ٢ | ٣ |
| ١١- من المشي لمسافة مئة متر؟ | ١ | ٢ | ٣ |
| ١٢- من الاستحمام أو ارتداء الملابس بنفسك؟ | ١ | ٢ | ٣ |

**الصحة الجسمية:**

| **تتعلق البنود التالية بالمشاكل التي يمكن أن تواجهك خلال تأديتك لعملك أو الانشطة اليومية المعتادة نتيجة لحالتك الصحية الجسمية. خلال الأسابيع الأربعة الماضية، هل تسببت حالتك الصحية الجسمية في:** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح) | | |
|---|---|---|
| | **نعم** | **لا** |
| ١٣- التقليل من الوقت الذى تقضيه في العمل أو أي أنشطة أخرى؟ | ١ | ٢ |
| ١٤- التقليل مما تود إنجازه من العمل أو من أي أنشطة أخرى؟ | ١ | ٢ |
| ١٥- تقيدك في أداء نوع معين من الأعمال أو أي أنشطة أخرى؟ | ١ | ٢ |
| ١٦- أن تجد صعوبة في تأدية العمل أو أي أنشطة أخرى؟ (على سبيل المثال احتجت إلى جهد إضافي لتأديتها) | ١ | ٢ |

**الصحة النفسية:**

| **تتعلق البنود التالية بالمشاكل التي يمكن أن تواجهك خلال تأديتك لعملك أو الانشطة اليومية المعتادة نتيجة لحالتك الصحية النفسية .خلال الأسابيع الأربعة الماضية، هل تسببت حالتك الصحية الجسمية في:** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح) | | |
|---|---|---|
| | **نعم** | **لا** |
| ١٧- التقليل من الوقت الذى تقضيه في العمل أو أي أنشطة أخرى؟ | ١ | ٢ |
| ١٨- التقليل مما تود إنجازه من العمل أو من أي أنشطة أخرى؟ | ١ | ٢ |
| ١٩- عدم إنجاز العمل أو أي أنشطة أخرى بالحرص المعتاد؟ | ١ | ٢ |

**النشاط الإجتماعي:**

| **٢٠- خلال الأسابيع الأربعة الماضية، إلى أي مدى تعارضت حالتك الجسمية أو النفسية مع تأديتك لنشاطاتك الاجتماعية المعتادة مع عائلتك أو أصدقائك أو جيرانك أو أي من المناسبات الاجتماعية الأخرى؟** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح) |
|---|
| ١- لم يكن هناك أي تعارض اطلاقاً |
| ٢- كان هناك تعارض قليل |
| ٣- كان هناك تعارض متوسط |
| ٤- كان هناك تعارض كبير |
| ٥- كان هناك تعارض كبير جداً |

**شدة الألم:**

| **٢١- ما شدة الألم الجسمي الذي عانيت منه خلال الأسابيع الأربعة الماضية؟** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح) |
|---|
| ١- لم يكن هناك أي ألم |
| ٢- كان هناك ألم خفيف جداً |
| ٣- كان هناك ألم خفيف |
| ٤- كان هناك ألم متوسط |
| ٥- كان هناك ألم شديد |
| ٦- كان هناك ألم شديد جداً |
| **٢٢- خلال الأسابيع الأربعة الماضية، إلى أي مدى أدى الألم الجسمي إلى التعارض مع تأديتك لأعمالك (سواء داخل المنزل أو خارجه)؟** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح) |
| ١- لم يكن هناك أي تعارض |
| ٢- كان هناك تعارض قليل جداً |
| ٣- كان هناك تعارض متوسط |
| ٤- كان هناك تعارض كبير |
| ٥- كان هناك تعارض كبير جداً |

**الأسئلة التالية تتعلق بكيفية شعورك وطبيعة سير الأمور معك خلال الأسابيع الأربعة الماضية، الرجاء إعطاء إجابة واحدة لكل سؤال بحيث تكون الإجابة هي الأقرب إلى الحالة التي كنت تشعر بها.** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح)

**خلال الأسابيع الأربعة الماضية، كم من الوقت:**

| | في كل الاوقات | في معظم الاوقات | في كثير من الاوقات | في بعض الاوقات | في قليل من الاوقات | لم أشعر في أي وقت من الاوقات |
|---|---|---|---|---|---|---|
| ٢٣- شعرت بأنك مليئ بالحيوية والنشاط؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٢٤- كنت شخصاً عصبيا جداً؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٢٥- شعرت بأنك في حالة من الاكتئاب إلى درجة لم يكن معها إدخال السرور إليك؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٢٦- شعرت بالهدوء والطمأنينة؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٢٧- كانت لديك طاقة كبيرة؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٢٨- شعرت بالإحباط واليأس؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٢٩- شعرت بأنك منهك (إستنفذت قواك)؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٣٠- شعرت بأنك شخص سعيد؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |
| ٣١- شعرت بأنك متعب؟ | ١ | ٢ | ٣ | ٤ | ٥ | ٦ |

**٣٢- خلال الأسابيع الأربعة الماضية، ما مقدار الوقت الذي تعارضت فيه صحتك الجسمية أو مشاكلك النفسية مع نشاطاتك الاجتماعية (مثل زيارة الأقارب والأصدقاء وغير ذلك)** ؟ (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح)

١- كان التعارض في كل الأوقات
٢- كان التعارض في معظم الأوقات
٣- كان التعارض في بعض الأوقات
٤- كان التعارض في قليل من الأوقات
٥- لم يكن هناك تعارض في أي وقت من الأوقات

**ما مدى صحة أو خطأ كل من العبارات التالية بالنسبة إلى حالتك الصحية؟** (إختر اجابة واحدة صحيحة بوضع علامة دائرة على الرقم الصحيح)

| | صحيحة بلا شك | صحيحة غالبا | لا أعلم | خطأ غالبا | خطأ بلا شك |
|---|---|---|---|---|---|
| ٣٣- يبدو أنني أصاب بالمرض أسهل من الاخرين. | ١ | ٢ | ٣ | ٤ | ٥ |
| ٣٤- حالتي الصحية مساوية لأى شخص أعرفه. | ١ | ٢ | ٣ | ٤ | ٥ |
| ٣٥- أتوقع أن تسوء حالتي الصحية. | ١ | ٢ | ٣ | ٤ | ٥ |
| ٣٦- حالتي الصحية ممتازة. | ١ | ٢ | ٣ | ٤ | ٥ |

## Annexes (6) Scoring the SF-36 questionnaire

| ITEM NUMBERS | Change original response category (a) | To recoded value of: |
|---|---|---|
| 1,2,20,22,34,36 | 1----------> | 100 |
| | 2----------> | 75 |
| | 3----------> | 50 |
| | 4----------> | 25 |
| | 5----------> | 0 |
| 3,4,5,6,7,8,9,10,11,12 | 1----------> | 0 |
| | 2----------> | 50 |
| | 3----------> | 100 |
| 13,14,15,16,17,18,19 | 1----------> | 0 |
| | 2----------> | 100 |
| 21,23,26,27,30 | 1----------> | 100 |
| | 2----------> | 80 |
| | 3----------> | 60 |
| | 4----------> | 40 |
| | 5----------> | 20 |
| | 6----------> | 0 |
| 24,25,28,29,31 | 1----------> | 0 |
| | 2----------> | 20 |
| | 3----------> | 40 |
| | 4----------> | 60 |
| | 5----------> | 80 |
| | 6----------> | 100 |
| 32,33,35 | 1----------> | 0 |
| | 2----------> | 25 |
| | 3----------> | 50 |
| | 4----------> | 75 |
| | 5----------> | 100 |

(a) Precoded response choices as printed in the questionnaire.

## Annexes (7) SF-36 dimensions

| SCALE | NUMBER OF ITEMS | AFTER RECORDING AS PER TABLE 1, AVERAGE THE FOLLOWING ITEMS |
|---|---|---|
| Physical functioning | 10 | 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| Role limitations due to physical health | 4 | 13, 14, 15, 16 |
| Role limitations due to emotional problems | 3 | 17, 18, 19 |
| Energy/ fatigue | 4 | 23, 27, 29, 31 |
| Emotional well being | 5 | 24, 25, 26, 28, 30 |
| Social functioning | 2 | 20, 32 |
| Pain | 2 | 21, 22 |
| General health | 5 | 1, 33, 34, 35, 36 |

## Annexes (8) Glaucoma Quality of Life-15 Questionnaire

| "Does your vision give you any difficulty, even with glasses, with the following activities?" (1 = no difficulty, 2 = a little bit of difficulty, 3 = some difficulty, 4 = quite a lot of difficulty, 5 = severe difficulty) |
|---|
| 1. Reading newspapers |
| 2. Walking after dark |
| 3. Seeing at night |
| 4. Walking on uneven ground |
| 5. Adjusting to bright lights |
| 6. Adjusting to dim lights |
| 7. Going from light to dark room or vice versa |
| 8. Tripping over objects |
| 9. Seeing objects coming from the side |
| 10. Crossing the road |
| 11. Walking on steps/stairs |
| 12. Bumping into objects |
| 13. Judging distance of foot to step/curb |
| 14. Finding dropped objects |
| 15. Recognizing faces |

## Glaucoma Quality of Life-15 Questionnaire Arabic- version

| | لا صعوبات | صعوبات قليلة | صعوبات *متوسطة* | الكثير من الصعوبات | صعوبات شديدة | لا يؤديها لأسباب لا تتعلق بالنظر |
|---|---|---|---|---|---|---|
| *1.* قراءة الصحف | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| 2. السير بعد حلول الظلام | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *3.* الرؤية في الليل | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *4.* السير على ارض غير مستوية | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *5.* التأقلم مع الضوء المشع | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *6.* التأقلم مع الضوء الخافت | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *7.* الانتقال من غرفة مضيئة الى اخرى معتمة او العكس | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *8.* التعثر بالاجسام | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *9.* رؤية الاجسام القادمة من الجانب | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *10.* عبور الطريق | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *11.* السير على الدرج | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *12.* الارتطام بالاجسام | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *13.* تقدير المسافة بين القدم والدرج او حافة الرصيف | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| *14.* ايجاد الاجسام التي اوقعتها | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |
| 15. تمييز الوجوه | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***0*** |

# Annexes (9) Academic approval


Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة


التاريخ:27/9/2016

حضرة / د. ناصر أبوشعبان المحترم
مدير عام دائرة تنمية القوى البشرية – وزارة الصحة
السلام عليكم ورحمة الله،،،

الموضوع:مساعدة الطالب محمد زكريا مشتهى

نشكر لكم دعمكم الدائم لمسيرة العلم والتعليم وخصوصاً دعم كلية الصحة العامة وطلابها، ونود أعلامكم بأن الطالب المذكور أعلاه يقوم بعمل بحث كمتطلب للحصول على درجة الماجستير في الصحة العامة–مسار إدارة صحية بعنوان:

**Quality of Life among Patients with Glaucoma in Gaza Governorates**

وعليه نرجو من سيادتكم التكرم بالموافقة على تسهيل مهمة الطالب في إنجاز هذا البحث حيث تشمل عينة الدراسة المرضى المصابين بمرض الجلوكوما والمراجعين في مستشفى العيون ومجمع غزة الأوروبي التابعة لوزارة الصحة .

شاكرين لكم حسن تعاونكم ودعمكم للمسيرة التعليمية،،،
و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حميد
منسق عام برامج الصحة العامة
جامعة القدس–فرع غزة

نسخة: الملف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ص.ب. ٥١٠٠٠ القدس

## Annexes (10) Helsinki Committee approval

المجلس الفلسطيني للبحث الصحي
Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار
Developing the Palestinian health system through institutionalizing the use of information in decision making

**Helsinki Committee**
For Ethical Approval

**Date: 01/08/2016** **Number:** PHRC/HC/147/16

**Name:** MOHAMMED Z. MUSHTAHA **الاسم:** محمد زكريا مشتهى

We would like to inform you that the committee had discussed the proposal of your study about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

**Quality Of life among patients with Glaucoma in Gaza Governorates**

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/147/16 in its meeting on 01/08/2016

و قد قررت الموافقة على البحث المذكور عاليه بالرقم و التاريخ المذكوران عاليه

**Signature**

Member Member

Chairman

**Genral Conditions:-**

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

**Specific Conditions:-**

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين
شارع النصر - مفترق العيون

# Annexes (11) MOH approval



State of Palestine
Ministry of health

دولة فلسطين
وزارة الصحة

التاريخ:29/09/2016

السيد : ناصر الدين رافت مصطفى ابوشعبان حفظه الله
مدير عام بالوزارة/الادارة العامة لتنمية القوى البشرية - /وزارة الصحة
السلام عليكم ورحمة الله وبركاته ,,,

الموضوع/ تسهيل مهمة باحث/ محمد مشتهى

التفاصيل //

بخصوص الموضوع أعلاه، يرجي تسهيل مهمة الباحث/ محمد زكريا مشتهى الملتحق ببرنامج ماجستير الصحية العامة – مسار :- إدارة صحية - كلية الصحة العامة - جامعة القدس في إجراء بحث بعنوان

" Quality of Life among Patients with Glaucoma in Gaza Governorates"

.حيث الباحث بحاجة لتعبئة استبانه من مرضى الجلوكوما المراجعين لعيادات الجلوكوما في مستشفى العيون ومستشفى غزة الأوربي

نأمل توجيهاتكم لذوي الاختصاص بضرورة الحصول على الموافقة المستنيرة من المرضى اللذين هم على استعداد للمشاركة في الدراسة ومن ثم تمكين الباحث من التواصل معهم، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي، و دون تحمل الوزارة أي أعباء أو مسئولية.

,,,وتفضلوا بقبول التحية والتقدير

محمد ابراهيم محمد السرساوي
- مدير دائرة/الادارة العامة لتنمية القوى البشرية

التحويلات

| | | |
|---|---|---|
| ■ محمد ابراهيم محمد السرساوي(مدير دائرة) | ناصر الدين رافت مصطفى ابوشعبان(مدير عام بالوزارة) | اجراءاتكم بالخصوص |
| ■ ناصرالدين رافت مصطفى ابوشعبان(مدير عام بالوزارة) | عبد اللطيف محمد محمد الحاج(مدير عام بالوزارة) | اجراءاتكم بالخصوص |
| ■ عبد اللطيف محمد محمد الحاج(مدير عام بالوزارة) | يوسف فوزي اسماعيل العقاد(طبيب رئيس قسم) | إجراءاتكم بالخصوص |
| ■ عبد اللطيف محمد محمد الحاج(مدير عام بالوزارة) | عبدالسلام محمد عبد صباح(مدير مستشفى) | إجراءاتكم بالخصوص |
| ■ يوسف فوزي اسماعيل العقاد(طبيب رئيس قسم) | اتحاد شكري شاكر شبير(رئيس قسم اداري) | لعمل اللازم |
| ■ يوسف فوزي اسماعيل العقاد(طبيب رئيس قسم) | عطا اسماعيل خليل الجعبري(مدير دائرة التمريض) | لعمل اللازم |
| ■ يوسف فوزي اسماعيل العقاد(طبيب رئيس قسم) | كمال صبحي عبدالحميد موسى(مدير اداري) | لعمل اللازم |
| ■ كمال صبحي عبدالحميد موسى(مدير اداري) | يحيى عبد القادر رمضان النواجحه(رئيس شعبة اداري) | لعمل اللازم |

# تقييم جودة الحياة لدى مرضى الجلوكوما (المياه الزرقاء) في قطاع غزة

إعداد: محمد زكريا مشتهى

إشراف: د أشرف الجدي

## ملخص الرسالة

**مقدمة**

الجلوكوما (زرق العين) هو السبب الرئيسي الثاني للعمي في العالم. وهو عبارة عن مجموعة من امراض العين التي تتلف الوظيفة البصرية بشكل دائم. والتي بدورها تؤثر سلبا على جودة الحياة، وتعتبر جودة الحياة مؤشرا هاما لتقييم جودة الرعاية الصحية للمرضى الذين يعانون من الامراض المزمنة. لذلك كان الهدف العام من الدراسة هو تقييم جودة الحياة لدى مرضى الجلوكوما (زرق العين) في محافظات غزة.

**المنهجية**

تصميم هذه الدراسة وصفي تحليلي مقطعي لقياس جودة الحياة لدى مرضى الجلوكوما. حيث استهدفت الدراسة 265 مريضا من مرضى الجلوكوما والذين تبلغ أعمارهم 18 فما فوق ويخضعون للعلاج والمتابعة في مستشفى النصر للعيون ومستشفى غزة الأوروبي، وقد تم جمع البيانات من خلال الاستبيانات Short Form-36 Questionnaire و Glaucoma quality of life-15 مع معدل استجابة (88.6%)

**النتائج**

أظهرت النتائج ان جودة الحياة لدى مرضى الجلوكوما في غزة كانت متوسطة، وبلغ متوسط الحرز الإجمالي لاستبيان جودة الحياة GQOL-15 هو 59.2±17.6 واظهر المرضى صعوبة كبيرة في الأنشطة المتعلقة بالتكيف مع الظلام 48.5، تليها الرؤية المركزية 57.3، الرؤية المحيطية 61.4، والاقل صعوبة هو التنقل بالخارج 66.6. وأيضا بلغ متوسط الحرز الإجمالي لاستبيان جودة الحياة SF-36هو 61.7 متراوحا بين 48.5و 79.4 وفق المقاييس الفرعية. كما اشارت النتائج ان محور (الألم الجسدي) حصل على أفضل متوسط 79.4 وحصل محور (النشاط الاجتماعي) على 72.22، بينما كان أدني محور كان (الصحة العامة) 48.58.

بينت النتائج أيضا ان مستوى جودة الحياة لدى الاناث أفضل من الذكور، وان الفئة العمرية (18-30) حصلت على اعلى مستوى جودة حياة مقارنة بالفئات العمرية الأخرى، كما أظهرت الدراسة ان مرضى الجلوكوما ذوي الدخل الأعلى من 1000 شيكل يتمتعون بجودة حياة اعلى من ذوي الدخل المتدني.

في حين أوضحت النتائج ان مرضى الجلوكوما المصابين بمرض عيون اخر او مرض مزمن كانت لهم مستويات جودة الحياة اقل من غير المصابين بالإضافة أيضا فقد وجدت النتائج ان المرضى المصابين ب الجلوكوما بمدة اقل من 5 سنوات كانت لهم مستويات جودة الحياة الأفضل.

وأخيرا كانت مستويات جودة الحياة للمرضى من حملة الشهادات الجامعية أفضل بكثير مقارنة بحملة الشهادات الثانوية واقل. وايضا كان مستوى جودة الحياة أفضل بين المرضى الذين يعملون مقارنه بالعاطلين عن العمل.

**الخلاصة**

خلصت الدراسة الى ان جودة الحياة لدى مرضى الجلوكوما في قطاع غزة كانت متوسطة، واظهرت الدراسة بعض المشكلات المشتركة التي صادفت المرضى والتي لا تظهر خلال الفحص الروتيني والدوري لهم. ويتضح من الدراسة

ان مرض الجلوكوما يؤثر بشكل سلبي على الحالة الجسدية والاجتماعية والنفسية للمرضى. وأخيرا مرضى الجلوكوما يجب تثقيفهم لفهم المرض وخطورته ومدى أهمية الالتزام بالعلاج.

**التوصيات**

تسلط النتائج الضوء على بعض التوصيات المهمة منها

- زيادة الجهود المبذولة لمنع تدني المستوى في جودة الحياة وما يترتب عليه من اثار سلبية على حياة المرضى
- دعم الرعاية الأولية للعيون من خلال
  - تنفيذ برامج تثقيفية للأطباء واخصائي البصريات لتقديم جلسات استشارية تساعد المرضى على التكيف مع حالتهم المرضية
  - تنفيذ برامج إعادة التأهيل البصري لمرضى الجلوكوما
- تطوير الملفات الطبية للمرضى
- توفير الدعم الاجتماعي والمالي للمرضى بهدف تحسين جودة الحياة لهم وتخفيف عبء المرض عنهم
- توفير الادوية بشكل دائم للمرضى
- تقديم برامج مناسبة تهدف الى تحسين الوضع النفسي للمرضى
- زيادة عدد العيادات الطبية المتخصصة لعلاج مرضى المياه الزرقاء، للكشف المبكر عن المرض.