Deanship of Graduate Studies
Al-Quds University

Evaluation of Diabetic Retinopathy Management in the Gaza Strip

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M. Sc. Thesis

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Evaluation of Diabetic Retinopathy Management in the Gaza Strip

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Thesis Approval

Evaluation of Diabetic Retinopathy Management in the Gaza Strip

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Dedication

Every challenging work needs self-efforts as well as guidance of older especially those who were very close to our heart.

My humble effort I dedicate to my precious mother's soul.

To my sweet and loving father and step mother.

To my beloved husband "Majed" for being the greatest source of inspiration, unlimited support and encouragement.

To my brothers and sister for giving me the faith and the passion to complete this study.

To my sweet kids "Maher" and "Ameer".

To everyone who contributed to make this study a reality

Marian Jameel Soliman Saba

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:

Marian Jameel Soliman Saba

Date: 11/12/2022

Acknowledgment

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Yours faithfully

Marian Jameel Soliman Saba

Abstract

Introduction: Diabetic Retinopathy (DR) affects approximately one- third of people with diabetes mellitus, and can lead to visual impairment and blindness if not detected and treated in time. DR has major health and economic implications globally, especially in countries like Palestine where the diabetes mellitus prevalence is significantly increasing. The study aimed to assess the management of DR in the Gaza Strip to improve the quality of the provided services and thus improve patients' overall outcomes.

Methods: The study design is a mixed method that includes both qualitative and quantitative data collection. The quantitative design is descriptive analytical cross-sectional. The quantitative data were collected from patients with diabetes mellitus previously diagnosed with DR regardless the DR grade, who utilized DR services at one of the study settings which are the three main hospitals offering ophthalmic services. In total,404 patients participated in the quantitative study. The qualitative data were collected through five focus groups discussion with patients with diabetes mellitus suffering from DR, and also in-depth interviews were carried out with five ophthalmic service providers who are expert in DR treatment. Analysis of quantitative data was conducted using SPSS program, the analysis involved conducting different types of statistical tests. For qualitative data, an open coding thematic analysis method was used.

Results: The results of the study showed that 88.1% of the study participants were suffering from type 2 diabetes mellitus compared to 11.9% of them were suffering from type 1 diabetes mellitus. The mean years of suffering from diabetes mellitus was13.07 years. 51.5% of participants had another family member with diabetes mellitus mainly a mother and a father. A total of 56.1% of participants described themselves as either overweight or obese. About 40% of participants had another co-morbidity, mainly hypertension and 15.3% of study participants suffered from other diabetes mellitus complications, mainly from peripheral neuropathy.

Most of the study (90%) participants took their medication regularly. Regarding DR, the mean years of suffering from DR was 4.23 years. For laboratory analysis, 86.1% of the study participants conducted laboratory analysis annually, 89.9% of them received feedback about their lab test results, only 42.3% of participants reported having controlled HbA1c levels compared to 53.6% were uncontrolled and 4.1% of them didn't know. Of the study participants, 71% reported the absence of full insurance coverage and that they still have to pay for the services. The mean participants' level of awareness about DR was 86.8%. Only 51.6% of participants reported that services met their expectations. The mean waiting time was 57.02 minutes, and the weighted mean of patient-provider interactions was 77.4%. Regarding patient satisfaction with the provided services, the mean of satisfaction was 75.56% and it was significantly associated with age, gender and working status. While the mean of retinopathy-dependent quality of life (RetDQoL) was 67.91%, and it was significantly associated with marital status, years of schooling, and working status.

Conclusions: Despite having a good patient level of awareness about DR, less than half of the participants had controlled HbA1c levels, which is the main factor in preventing diabetes mellitus complications, including DR. Patients were given awareness about DR after being diagnosed with it. This could be explained by the limited focus on diabetic self-care, insufficient education about possible diabetic complications prevention, limited screening programs, inadequate contact time with primary healthcare providers, and an inadequate number of specialized healthcare providers to deal with the DR. In addition to the absence of proper guidelines to manage DR in governmental hospitals. Timely and regular screening and appropriate interventions, and follow up could delay, or prevent progression toward complete loss of vision.

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List of abbreviations

ACCORD Actions to Control Cardiovascular Risk in Diabetes
AAO American Academy of Ophthalmology
ADA American Diabetes Association
BMI Body Mass Index
CDC Center for Disease Control and Prevention
COPD Chronic Obstructive Pulmonary Disease
COVID 19 Coronavirus Disease 2019
DM Diabetes Mellitus
DR Diabetic Retinopathy
DME Diabetic Macular Edema
DRS Diabetic Retinopathy Screening
EGH European Gaza Hospital
GS Gaza Strip
HTN Hypertension
HGA1c Hemoglobin A1c
IDF International Diabetes Federation
IAPB The International Agency for the Prevention of Blindness
MoH Ministry of Health
NCTR National Center for Transit Research
NGO's Non-Governmental Organization
NOH Al Naser Ophthalmic hospital
NPDR Non-Proliferative Diabetic Retinopathy
ILS New Israeli Shekel
NCDs Non -Communicable Diseases
OCHA United Nations Office for the Coordination of Humanitarian Affairs
PDR Pro-liferative Diabetic Retinopathy
PCBS Palestinian Center Bureau of Statistics
RetTSQ Retinopathy Treatment Satisfaction Questionnaire
RetDQoL Retinopathy Dependent Quality of Life
SJEH Saint John Eye Hospital
STDR Sight Threatening Diabetic Retinopathy
UNRWA United Nations Relief and Works Agency for Palestine Refugees in the Near East
USD United States dollar
VTDR Vision-Threatening Diabetic Retinopathy
WDF World Diabetes Foundation
WHO World Health Organization

Chapter One

Introduction

1.1 Background

Diabetes Mellitus (DM) is a global public health disease projected to affect 642 million adults by 2040, of them 75% residing in low- and middle-income countries (Wong & Sabanayagam, 2020). Nearly half of persons with diabetic (49.7%) are undiagnosed. In 2017, globally there were 5 million deaths due to DM (Hammad, 2019). DM has important impact on health financing as the health care expenditure on diabetic patients was approximately 850 billion United States Dollar (USD) in 2017, and expected to be continuously increased (Hammad, 2019).

In Palestine, DM is ranked as the fourth leading cause of death, with prevalence of 9.1% in patients aged from 20-79 years old and this percent is predicted to be increased to 20.6% in 2020 (Sharif & Imam, 2019).

Diabetic Retinopathy (DR) is one of the main neurovascular complications of DM, that involves damage to the tiny blood vessels in the back of eye. (Shukla & Tripathy, 2022). DR may lead to vision-threatening damage to the retina, ending in vision loss (Shukla & Tripathy, 2022). Globally, approximately 95 million (35.4%) of diabetic patients have DR, of which a third have VTDR and 7.6% have macular edema (Tilahun et al., 2020).

DR is the leading cause of blindness and visual impairment in working-aged adults (Wong & Sabanayagam, 2020), it is associated with poor quality of life, lower levels of psychosocial well-being, and an increased risk of other DM complications and mortality (Wong& Sabanayagam, 2020). It has been estimated that more than one-third of those with DM worldwide have some form of DR and nearly 1 in 10 have vision-threatening levels of DR (VTDR) including Pro-liferative DR (PDR) and Diabetic Macular Edema (DME) (Wong& Sabanayagam, 2020).

DM complications ranked the fifth cause of death in Palestine in 2018 with proportion of 7.5% (Ministry of Health -MoH-, 2019). DM and its complications not only increase the financial burden on individuals and their families but also impose burden on health care system (World Health Organization -WHO-, 2016).

1.2 Problem statement

Globally, DR is one of the fastest growing eye health epidemics, that poses a strategic problem for even the most well-equipped healthcare services providers (The International Agency for the Prevention of Blindness -IAPB-, 2018). According to Palestinian MoH report published in 2017 the ophthalmology disease is second of the top tenth by cost and referral number, it costs 43,001,816 New Israeli Shekel (ILS) and 6,620 referrals annually (MoH, 2017). In 2022, the prevalence of DR among diabetic patients in the Gaza Strip (GS) was 35.8% (Mikki & Mactaggart, 2022).

In the GS, the status of services provided to clients with DR and how related services are being management is unclear and not properly studies. Indeed, few studies have been conducted to assess the management of DM. To the researcher best of knowledge, no studies have been conducted to evaluate the management of DR. Thus, this study will fill the gap by focusing on the evaluating the existing services provided to DR clients and evaluating them from the time of diagnosis. The study will exam the availability of competent healthcare workers to deal with DR, the availability of guidelines, affordability of appropriate treatment, both medical and surgical, long-term follow up process and the referral pathways across different providers. The study will fill the gap related to the availability of information about coordination among providers.

1.3 Aim of the study

This study aims to assess the current DR management among diabetic patients in order to propose recommendation not only to reduce the complication associated with DR, which may lead to irreversible blindness, but also to reduce the cost of the provided services. Additionally, the findings of the study could contribute to improvement in the quality of provided services and thus, improving the quality of life of DR patients.

1.4 Objectives

- To assess the current management processes of DR in the GS.
- To identify the main areas of strengths and weakness of DR health care services at the GS.
- To assess the quality of life of DR patients in the GS.

- To assess the DR patients' satisfaction with the provided services to control their blood glucose level.
- To propose recommendations for policy makers to improve the quality of the provided services.

1.5 Justification

In the GS, to the Researcher best knowledge, no studies have been conducted to assess management processes of DR. Thus, this study will focus particularly on assessing the management of DR in the GS. The findings of this study would be utilized by service providers to provide higher quality services to patients with DR services. DR patients have the right to receive quality health care services that protect them from further complications, financial catastrophe due to high cost of health services and improve their quality of life. From economic perspectives, proper management of DR will improve the effectiveness and the efficiency of the given services thus reducing the health expenditure on DR and its associated consequences.

Moreover, the study findings will provide policy and decision makers with evidence that could be used to improve the quality of the services provided to DR clients, by identifying the existing gaps in the current system, helping them in targeting the weakness of the system to improve the outcomes, patient satisfactions and quality of life. Also, they may provide insights for donors to invest more in improving the DR services, including availability, affability, and quality. Moreover, this study will be of value to the Researcher herself as being involved in this field and provides her with rich background about DR management.

1.6 Study Context

1.6.1 Demographic and Geographic Context

The GS comprises a narrow zone of land located in the south part of Palestine with about 2.05 million inhabitants; it is composed of five governorates: North Gaza, Gaza, Dier Alballah, Khanyounis, and Rafah (Palestinian Center Bureau of Statistics -PCBS-, 2020). Gaza governorate has the second highest number of populations 2.05million, which divided to 1.04 million males and 1.01 thousand females (PCBS, 2020). Although, GS is

narrow place of land 365 km2 (141 sq. mi), it considers to have one of the highest population densities in the world; in 2017 the population density/km^2 was 5204 (PCBS, 2018).

Despite the fact that the Palestinian Population is young; more than one-third of the population is less than 15 years. And the elderly population aged (65 years and above) constituted only 3% of the total population (PCBS, 2020). According to Palestine 2030 report there are important demographic shifts in Palestine include the aging of the population and the projected growth of older groups; the proportion of Palestinians aged 65 years and over will increase from 2.9% to 7.7.%. As a result of aging, there will be more elderly men, and particularly more women, more chronic and degenerative diseases, and more multiple health problems. The increase of life expectancy at older ages should also be accompanied by a parallel improvement in the quality of life.

1.6.2 Socioeconomic context

The financial circumstances in the GS characterized by high level of poverty and low income, the difficult political and economic conditions deteriorate the life of people due to the high level of uncertainty, occupation, recurrent wars and constricted siege that prevent free movement of goods and people across the borders (Hammad, 2019). The political situation deeply affects the economic situation result in high unemployment, high poverty rate, and collapse of the private sectors that had depended on mainly on export markets (Hammad, 2019).

1.6.3 Healthcare system

There are four healthcare providers: the first is the MoH which is the main healthcare provider, provides primary, secondary, and tertiary healthcare services. The second provider is United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) that provides health programs concentrated on comprehensive, preventive and primary health services covering family health disease prevention and control, provided free of charge to all refugee. The third provider is the Non-Governmental Organization (NGO's) which provides primary, secondary, and tertiary healthcare services for all. Finally, the private sector, which has hundreds of settings operating by private dentists, doctors, physicians, lab technician and others (Hammad, 2019).

1.6.4 Ocular care services

Eye services developed gradually at MoH, it was provided within small department at Al Shefaa Hospital till 1972, then Al Naser Ophthalmic Hospital (NOH) was formed to provide eye services for all citizens (Habib, 2016). NOH is one of the main governmental hospitals that provides surgical and clinical services in addition to emergency and primary care (Habib, 2016), the second main governmental hospital is the European Gaza Hospital (EGH), in which eye services provided at ophthalmic department within it, which was established in 2001 to serve south Gaza strip (Habib, 2016). In both hospitals services are delivered through ophthalmologist, resident, optometrists in addition to supporting nursing staff, anesthetic and pharmacists (Habib, 2016).

1.6.5 UNRWA

Since 1950, UNRWA has been one of the main healthcare providers for Palestinian refugees, providing healthcare services though network of 22 primary healthcare centers distributed across the GS (Hammad, 2019). UNRWA set a strategy that focuses on improving the quality of healthcare and consultations provided to non-communicable diseases (NCDs), UNRWA healthcare workers are trained in screen of DR for early detection and referral of diabetic patient with DR to receive further treatment and management at Saint John Eye Hospital (SJEH) (IAPB, 2018).

1.6.6 Saint John Eye Hospital (SJEH)

SJEH is charitable foundation, which was established in 1992 to meet the gowning need of ophthalmic services in Gaza, it provides eye care for all population regardless their ethnicity or ability to pay, its main hospital located at Jerusalem, with other branches in Gaza, Hebron, and Anabta. Since December 2015, one third of patients were unable to cross the borders and to be treated in the West bank, which increase the load on SJEH branch here in Gaza making it the leader provider for eye care. The new Gaza Hospital opened in June 2016. In 2022, SJEH reached almost 30,000 patients in our Gaza Hospital and performed over 2,100 major operations (SJEH, 2022).

1.7 Operational definition

DR among diabetic patients will be defined as cases that are medically diagnosed as DR, regardless of the DR stage According to the national eye institute.

Chapter Two

Conceptual Framework and Literature Review

2.1 Literature Review

2.1.1 Global burden of DR

DM is a global epidemic. In 2015, an estimated 415 million people had diabetes globally, and this number is expected to increase sharply to reach 642 million by 2040 (Wong & Sabanayagam, 2020). It has been expected that one third of those with DM worldwide supposed to have some form of DR and nearly 1 in 10 have vision threating levels of DR that may lead to irreversible blindness (Wong & Sabanayagam, 2020). Globally, the number of people with DR is expected to increase from 126.6 million in 2010 to 191 million by 2030, and some studies estimate that the number of patients with vision-threatening DR will grow from 37.3 to 56.3 million (Avidor et al., 2020). According to AAO the global prevalence of DR was 77.3% in DM Type1 and 25.1% in DM Type 2 in 2016, mainly present in low-middle income countries than that in high income countries (AAO, 2016).

2.1.2 Local burden of DR

In Gaza there is limited studies on the prevalence of DR. However, in 2017 Abu Mostafa reported that the prevalence of DR among males in the GS was 24.7%. And in 2022 Mikki & Mactaggart (2022) study, reported that DR is principal cause of blindness in the GS (Mikki & Mactaggart, 2022). According to Palestinian Annual Health Report published in 2017, DR ranks second most common DM complication after Neuropathy (MoH, 2017). However, Mikki & Mactaggart (2022) study reported that, 41.1% of DM patients had never had eye checkup or hadn't been checked in the last two years (Mikki & Mactaggart, 2022).

2.1.3 Diabetic Retinopathy (DR) definition and types

DR is one of the most common DM complications that result from damage of the blood vessels in the retina due to exposure to high sugar level, these vessels can swell and leak or they can close prevent blood flow from passing through it. Sometimes abnormal blood

vessels grow on the retina. All of these changes can lead to irreversible vision loss (American Academy of Ophthalmology -AAO-, 2022).

There are two main types of DR:

- Proliferative Diabetic Retinopathy (PDR) Vision Simulator is the growth of new blood vessel in the retina, these vessels could bleed inside the eye, result in few new specks or spots floating in the site of vision (AAO, 2022).
- Non-Proliferative Diabetic Retinopathy (NPDR) Vision Simulator occurs when tiny blood vessels leak making macular edema, or close making macular ischemia, result in vision blurry (AAO, 2022).

2.1.4 Factors affecting DR management

There are two types of risk factors associated with developing DR: modifiable risk factors including hyperglycemia, hypertension, hyperlipidemia and obesity, and non-modifiable risk factors including duration of diabetes, puberty and pregnancy factors (Amoaku et al., 2020). The basis for the medical management of DR depends on intensive control of blood glucose, blood pressure and blood lipids (Mansour et al., 2020).

Duration of diabetes is strongly associated with developing DR, about 76.7% of patients with DM for more than 20 years are diagnosed with DR regardless the grade of glycemic control (Giloyan et al., 2015). Previous studies demonstrate that intensive insulin therapy in type 1 diabetic patients over 6.5 years can reduce 34-76% of the occurrence of DR and can delay the first appearance of retinopathy up to 27% over four years (Mansour et al., 2020). Other studies show that in type 2 diabetes every 1% reduction in HGA1C, there was a 35% reduction in the risk of microvascular complications (Mansour et al., 2020).

Moreover, relationship between reductions in blood pressure and risk of developing DR is contradictory some studies have reported beneficial effect of intensive control of blood pressure on reduction the risk of DR (Amer et al., 2021), others have shown no significant effect (Liu et al., 2020).

The Actions to Control Cardiovascular Risk in Diabetes eye study revealed that intensive glycemic control, control of dyslipidemia with fenofibrate and simvastatin reduced the risk of retinopathy by one-third (Mansour et al., 2020).

Regarding sex and DR risk, there are inconsistent results. On one hand some studied revealed that DR risks shown to be most influenced by duration of DM, glycaemia and further increased by uncontrolled blood pressure and male sex. On the other hand, other studies conducted in Taiwan showed that blood pressure and female sex were significant independent risk factors for DR in type 2 DM patients (Tseng et al., 2015).

With regarding to hereditary and risk of developing of DR, survival analysis was conducted by Bek (2022) to assess the family history association with development of DR, the study illustrated that family history impacts differently the development of both PDR and DME, the risk for developing PDR was significantly decreased by 2–11 years in patient with diabetes type 1 who had other family member with diabetes, while the risk for developing DME was significantly higher by 4–24 years in patient with diabetes type 2 who had other family members with diabetes (Bek, 2022).

With age, DR severity significantly increases (Giloyan et al., 2015). While the relationship of DR and body mass index (BMI) was contradictory, most studies showed positive association between DR and high BMI, despite that in some of them it wasn't statistically significant relation, others showed different results (Giloyan et al., 2015).

2.1.5 The financial costs of diabetic eye disease

Globally, DR has significant public health and economic burden (Avidor et al., 2020). The American Diabetes Association estimates that DM costs the U.S. $327 billion annually, with $237 billion coming from direct medical costs and $90 billion coming from decreased productivity, and with nearly 30% of DM patients suffering from DR, so it's not surprising that the Centers for Disease Control and Prevention (CDC) found that diabetes-related blindness can cost more than $500 million annually. Moreover, those DM patients with even moderate DR had marked higher medical costs than those associated with other diabetes-related conditions, including neuropathy and chronic kidney disease (Ruchman, 2019).

2.1.6 DR Screening

Unlike other disease diagnosis procedures where patients do tests when a disease is suspected, DR screening looking for identifying a previously undetected complication of DM. DM patients who do not receive DR screening are at four times higher risk of developing Sight Threating Diabetic Retinopathy (STDR). Screening for DR is cost effective compared with the costs of vision loss from undetected DR, and additional cost savings can be made if high-risk groups are screened at shorter intervals than low-risk groups (Pearce et al., 2020).

2.1.6.1 Type of DR Screening

International and national guidelines recommend annual DR screening for all DM patients (Pearce et al., 2020). There are two types of DR screening: First, the systematic DR screening involves the selective identification of all DM patients at risk of developing DR, and uses quality-assured predetermined screening processes to ensure adequate coverage of the chosen patient population (Pearce et al., 2020). Systematic screening is probably the most effective way of detecting STDR; Unfortunately, it isn't easy to be performed in many healthcare systems where there are multiple healthcare providers without a centralized database of DM patients (Pearce et al., 2020).

Second, opportunistic methods such as local hospital-based projects or community-based screening programs that tend to cover fewer patients, so it considered less cost effective in the long-term manner than systematic screening programs (Pearce et al., 2020).

2.1.7 Global guidelines/protocols for management of DR

In principle, systemic medical control is critical for all patients with DM with and without DR. Recommendations include maintenance of HGA1c less than 7.0%, treatment of systemic hypertension, and dyslipidemia (Wong et al., 2018).

- **Recommendations for screening**

According to American Diabetes Association (ADA) guidelines, people with type 1 diabetes recommended to begin diabetic eye screening within the first 5 years of diagnosis. While people with type 2 diabetes should have eye screening at time of diagnosis with diabetes, and yearly checkup is recommended. However, if there is no evidence of

diabetic retinopathy, screening every two years may be considered (Liu & Swearingen, 2017).

2.1.8 Awareness and knowledge about DR

Venugopal and colleagues (2020), conducted cross- sectional study to assess the level of knowledge and awareness about diabetic retinopathy among patients in Goa, the study illustrated that 30.8% of the study participants were aware of DR and 31.1% of the participants had adequate level of awareness about DR. 98.7% of the participant believed that DM could affects their eyes. However, when they were asked specifically about DR only 29.9% of them were about DR. In despite of, participants awareness about the importance of undergoing regular eye check-up, only 44.4% of the participant underwent eye examination in the last six months. 56% of the participants reported that physicians were the main source of information about DR. Moreover, in Venugopal and colleagues (2020) study, patient level of awareness wasn't significantly associated with patient demographical characters or duration of DM (Venugopal et al., 2020). Another cross-sectional study was conducted by Abdulaal and colleagues (2019) in Saudi Arabia to assess diabetic patients' awareness about DR symptoms and complications, the study illustrated that 80.8% of the participants agreed with the negative impact of DM on their eyes. Only 48.8% of participants agreed with the need of eye screening even when their blood sugar level is controlled. Regarding the main source of information about DR, 44.9% reported that their physician was the main source of information, followed by family and media with 21.6%, 17.9% respectively (Abdulaal et al., 2019). Another study conducted by Al-Latayfeh and colleagues (2021) in Jordan to assess patient awareness about development of retinopathy in diabetic patients, the study illustrated 56.18% of the participants were aware about the normal HGA1c level. Only 33.11% knew that diabetes may affect their eyes. 62% of the participant underwent retinal screening, of which 76% underwent their first eye screening after more than one year of diagnosis (Al-Latayfeh et al., 2021).

2.1.9 Patient- provider interaction

Patient- provider interaction is considered one of the key factors influencing diabetic patient self-management. Promoting patient- provider communication and patient

participation in decision making process increase patient satisfaction, attendance and adherence to treatment plan resulting in improved health outcomes (Dao et al., 2019).

Previous study conducted by Hyman and colleagues (2017) in Toronto to assess patient-provider related factors associated with diabetes self-management; the study illustrated that 60.8% of the study participants felt they were treated fairly. 59.2% of the participants reported that they were treated with respect and dignity, 58.5% felt comfortable in the health care setting, and 53.9% reported being understood and accepted. Moreover, the study displayed significant relationship between the quality of the provider-patient interaction and diabetic self-management (Hyman et al., 2017). Recently conducted qualitative study by Hudson and colleagues (2022) in Southern California to assess factors affecting compliance with Diabetic Retinopathy screening. The study illustrated that patients who adhere more to their appointment and who communicated well with their providers were more aware about DM complications and management (Hudson et al., 2022).

2.1.10 Patient satisfaction to the provided DR services

Patient satisfaction is defined as the individual's emotional and physical experiences in relevant to the provided services and treatment result, which had viewed differently by physicians and patients when describing treatment success (Karadzic et al., 2020). Previous cross- sectional study conducted in Palestine by Khdour and colleagues (2020), to assess the impact of treatment satisfaction on patient quality of life and medication adherence. The study reported significant positive relationship between treatment satisfaction and patient quality of life with (P=.016). And another significant negative relationship between treatment satisfaction and anxiety/depression with (P=-.031), that means more satisfied patient had lower anxiety/ depression. Additionally, the study illustrated that 36.1% of the participants weren't satisfied with the pain and discomfort associated with the treatment, and 33.7% of them felt apprehensive about the treatment for their eye problem (Khdour et al., 2020). Another study conducted in Jordan by Al Sarairah and colleagues (2022), to assess patient satisfaction level to DR services. The mean of satisfaction was 67.14%. The highest satisfaction was observed in the interpersonal aspect, and the lowest satisfaction observed in the general satisfaction domain. Moreover, female participants had higher satisfaction score compared to male participants (Al Sarairah et al.,

2022). Another descriptive research survey conducted by Olajumoke and colleagues (2021) in Nigeria to assess psychological impact of diabetic care on satisfaction and quality of life of DM patients. The study illustrated that 60% of the participants were satisfied with DM treatment. However, more than half of the study participants weren't satisfied with the time taken to manage their conditions or to go for checkup. The study also revealed significant relationship between patient satisfaction to DM services and quality of life with (p-value=0.000) (Olajumoke et al., 2021).

2.1.11 Retinopathy Dependent Quality of Life (RetDQoL)

Quality of life is considered one of the main domains in evaluating the healthcare outcomes. Assessing quality of life should include different life aspects physical, phycological, social and general health perception (Deswal et al., 2020). In India, cross sectional study conducted by Deswal and colleagues (2020) to assess impact of diabetic retinopathy on quality of life in Indian diabetic patients. The mean of RetDQoL was (-1.164), which means having DR negatively impacts patient quality of life. Moreover, the study showed that having DR impacts negatively all life aspects, with more negative impacts on "personal affairs," "household tasks" and "get out and about" and less negative impact on "physical appearance," "past feelings" and "care of their diabetes". However, the maximum negative impact of DR was on the individuals' physical and social activities (Dewald et al., 2020). Another study conducted by Sepúlveda and colleagues (2015) to assess the health-related quality of life in type 1 and type 2 diabetic patients. The study illustrated that patient quality of life decreased with age and with being female in term of physical, social, emotional and general health. Moreover, obesity negatively impacts patient's quality of life in term of physical activity. Regarding treatment regimen, patients who used insulin therapy had lower quality of life compared to those taking oral medications. With regard to duration of DM, longer DM duration associated with lower quality of life in term of physical, mental, social and general health (Sepúlveda et al., 2015). Another descriptive research survey conducted by Olajumoke and colleagues (2021) in Nigeria to assess psychological impact of diabetic care on satisfaction and quality of life of DM patients. The study revealed that more than half of the participants (59.1%) reported that DM worsen their psychological well-being with expression of anxiety, depression, nervousness, low self-confident, loss of pleasure in carrying out daily activities and lack of concentration at work. Moreover, patient with DM is at two to three more times at risk of developing depression than those without DM. The study also revealed significant relationship between psychological experience and quality of life of diabetes patients (p-value=0.018) (Olajumoke et al., 2021).

2.2 Conceptual Framework

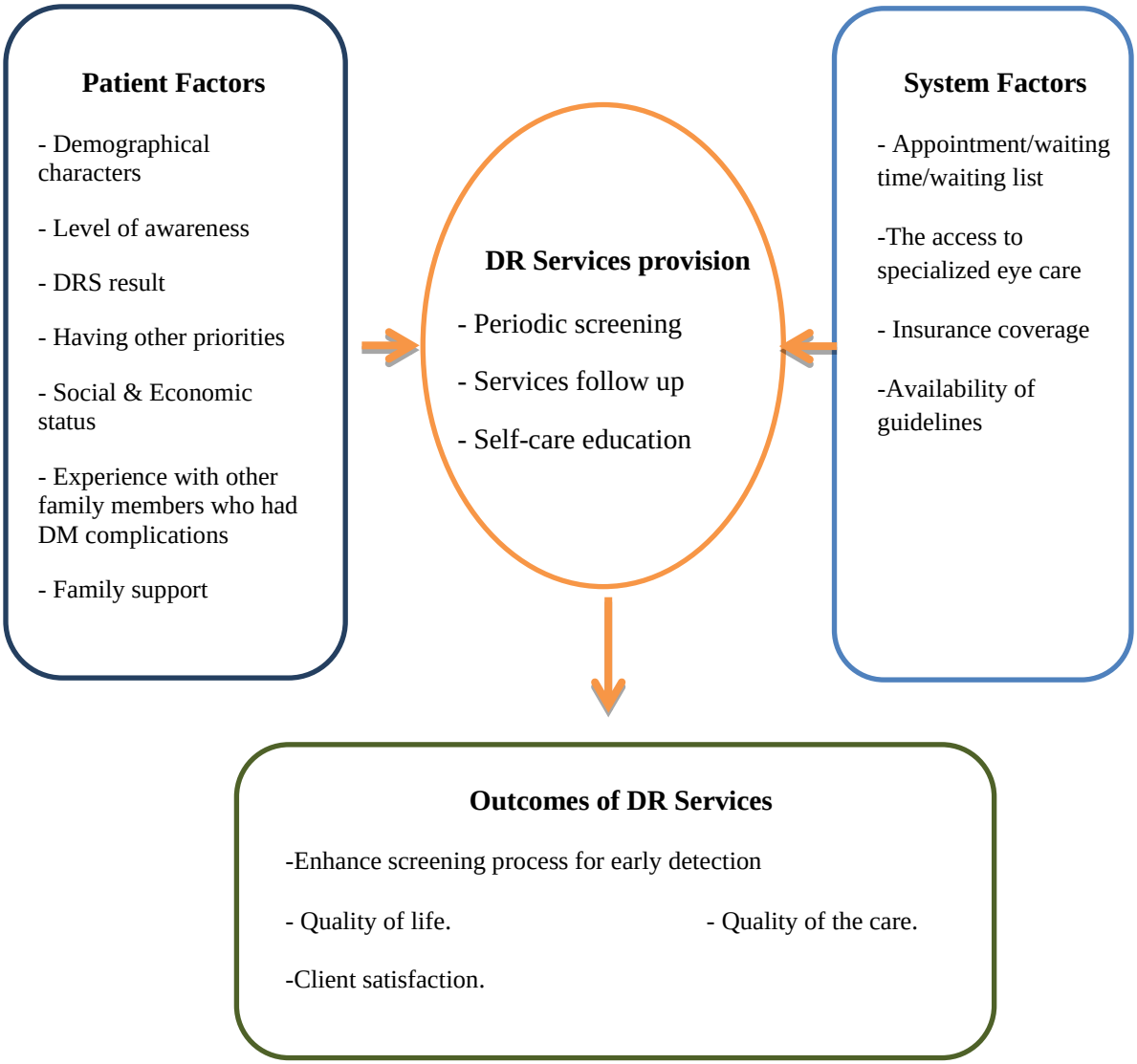

Figure (2.1): Conceptual Framework

This research process is guided and organized by the conceptual framework, which gives the meaning of research findings, there are different factors related to and affecting DR services. For this study the proposed framework consisted of two categories:

2.2.1 Patient Factors

Patient factors include the main factors affecting the performance of DR services on the patient's level such as demographical characters, level of awareness, Diabetic Retinopathy Screening (DRS) result, having other priorities, social & economic status of the patients, experience with other family members who had DM complications and family support.

2.2.1.1 Demographical characters

There are other factors that might have an influence on the services of DR, such as demographic characteristics, sex, age, weight, education level, medical and health condition and any associated illness

2.2.1.2 Level of awareness

The researcher will explore the effect of patient level of awareness about diabetic complications, preventive measures and the importance of periodic checking on early detection and management of DR and their impact on numbers of patients diagnosed at middle or late sage of DR.

2.2.1.3 DRS result

The researcher will explore to which degree the patients fearing about the findings and how to handle DRS result hinder them from preforming the test, and the impact of this on their health status.

2.2.1.4 Social & Economic status

The researcher will explore the impact of these factors on the services such as, education level, the belief that there is no need for DRS screening until the appearance of signs and symptoms, and that DR is incurable needs long treatment process. Also, patients fearing from exclusion from family or community due to DR morbidity. In addition to the economic status of patient's families and their influences on the services.

2.2.1.5 Having other priorities

The researcher will explore the influence of having other priorities like work or family members they have to care about on the patient's adherence to the process of management and treatment.

2.2.1.6 Experience with other family members who had DM complications

The researcher will assess the influence of previous experience with other family members who had DM complications on the patient's adherence to the process of management and treatment.

2.2.1.7 Family Support

The researcher will assess the impact of family support on patients' health status either in the health facilities or at home, many patients need assistance during their medical visits because of the side effect of the eye drop. Also, at home not only to aid patients to adhere to the treatment plan but also to offer psychological support to them.

2.2.2 System Factors

It reflects the factors that participate to deliver the desired outcomes, the process by which the actions are preformed to offer the desired healthcare services, such as appointment/waiting time/ waiting lists, access to specialized eye care, availability of guidelines and insurance coverage.

2.2.2.1 Appointment/waiting time/waiting list

Appointment system organizes the work environment and improve matches between the healthcare resources and the patient needs. A good appointment reduces waiting time and improve proper resources utilization. Timely offered care help to reduce complications and to improve the outcomes. Waiting time can be measured during the diagnosis, in the patient's follow-up and during the dispensing of drugs from the pharmacy.

2.2.2.2 Access to specialized eye care

The access to specialized eye care services such as having digital retinal cameras for DRS and specialized healthcare providers for preforming DRS in most of the clinics decrease

the load, waiting time, opportunities of getting appointments and waiting lists. The researcher will assess the availability of resources critical for delivery of effective eye services.

2.2.2.3 Insurance coverage

The researcher will explore to which degree the health insurance cover the eye service needed to the patients and the impact of the financial burden of treatment on the patient's adherence to the treatment plan.

2.2.2.4 Availability of guidelines

The researcher will explore if there are available guidelines, protocol and if being implemented. All steps in the services delivery should be based on evidence and should be compatible with local, national and international standards.

2.2.3 DR services provision

The previously mentioned factors will affect the provision of main DR healthcare services.

2.2.3.1 DM self-care education

Effective healthcare system, the system that provide full package of knowledge to DM patients, making patients more aware about DM, which includes early signs of hypo and hyperglycemia, treatment options, diet control, sports, DM complications that they may face on the long run and others. The researcher will assess to which degree the system offers full package of knowledge to DM patients and the gabs in knowledge that need to be fulfilled in order to improve the outcomes.

2.2.3.2 DR screening services

Periodic screening of DR, aim to reduce the risk of vision impairment, irreversible blindness among symptomatic people with diabetes. The researcher will explore how frequency DRS carried out to DM patients, the distance between the first and the second test.

2.2.3.3 Follow up services

It includes different types of tests and procedures and surgeries for proper monitor and control for DM patients with DR, like periodic DRS, management of blood sugar by both medication and lifestyle management, testing hemoglobin A1c (HGA1c) every three months and health educations to improve patient's awareness level. The researcher will assess to which degree the needed tests, procedures and surgeries are given to the patients.

2.2.4 Outcome of DR services

2.2.4.1 Enhance screening process

For early detection, it is one of the main indicators that reflect effectiveness of the DR services provided for DM patient, DRS services deeply affect the patient's outcomes. The researcher will assess the impact of periodic screening of DR in increase the effectiveness of the care and improve the health outcomes.

2.2.4.2 Improve the quality of life of DR patients

In general, the quality of life of DM patients with DR is significantly lower than those without DR with maximum effect seen on general health, vision and mental health. As the duration of DM and the severity of DR increased the quality of life decreased. The researcher will assess the patient's perceived impact of the services on their quality of life, including their perspectives on their health, how they feel in life, social relationships.

2.2.4.3 Client satisfaction

The researcher will explore to which degree the provided services meet patient needs and expectations.

2.2.4.4 Quality of care

The researcher will explore to which degree the services provided to patients lead to the desired health outcome. By assessing accessibility and service availability**.**

Chapter Three

Methodology

This Chapter provides a detailed description of the study methodology. It begins by describing the design of the study, the method of data collection and analysis, sampling technique, study population, study setting. Then, it describes strategies to ensure the validity and reliability of the study instruments, ethical considerations, and finally the study limitations.

3.1 Study Design and Method

This study is a mixed method that includes both qualitative and quantitative data collection methods. The quantitative part of this study is a descriptive cross-sectional. The cross-sectional design is appropriate for the description of the practice and it is relation to other variables. The qualitative data were collected through focus groups and in-depth interview with key's healthcare provider. Focus groups are one of the research techniques that collect data through interaction on a topic of interest by a researcher (Zangirolami-Raimundo et al., 2018). In-depth interview offers the opportunity to capture rich, descriptive data about how people think and behave, and unfolding complex processes (Showkat & Parveen, 2017). Mixed method approach provides rich, validate findings and especially useful in understanding the interaction between the quantitative result and qualitative findings, it reflects the participant point of view by giving a voice to study participants and ensure that study findings are grounded in participants' experiences (Timans et al., 2019).

3.2 Study settings

The study was conducted in the two governmental hospitals that provide ophthalmic care services in the GS, NOH and EGH, in addition to SJEH, the main charitable foundation that provides wide range of ophthalmic services to the Gaza's people.

3.3 Duration of the study

The study was started after having the university administrative approval and after obtaining the ethical approval from Helsinki committee, MoH and from SJEH manager.

The study was started in February 2022, first as a pilot study conducted in March 2022 and then the data collection process was continued in April 2022. Data entry and cleaning was started in May 2022. Coding and analysis of the data were conducted in June 2022. The study final report was completed in October 2022. **Annex (6)** described the study steps and the duration of each activity.

3.4 Study Population and Sample Size

3.4.1 Quantitative study

Regarding the quantitative part of the study, the study population consisted of DM patients previously diagnosed with DR regardless the grade of it, who were treated at one of the study settings. The sample size calculated to be 350 persons. The Researcher used the following parameters for sample calculation: maximum acceptable percentage points for error 5%, confidence level 95% and total population (3,937 persons) **Annex (8).**

Table (3.1) shows the distribution of the study sample proportional to the size of the hospitals.

Table (3.1): Number of patients representing population from which the sample will be selected

Hospital Name	Number	Percent from the theoretical population
El Nasser Ophthalmic Hospital	130	37
Sant John Hospital	122	35
Gaza European Hospital	98	28
Total	350	100

3.4.1.1 Eligibility Criteria – quantitative part

3.4.1.1.1 INCLUSION

- DM patients diagnosed with DR regardless the stage of DR who have been treated at the one of the study settings.

3.4.1.1.2 EXCLUSION

- DM patients with eye problem other than retinopathy were excluded from the study.
- Non cooperative and non-conscious patient.
- Clients below the age of 12 years' old.

3.4.2 Qualitative study

Regarding the qualitative part of the study, a non-probability purposive sample was taken from the study settings in which a total of 30 DR patients were invited to participate in the focus group discussions. In total, five focus group discussions were held. In addition to five in depth interview were conducted with key services providers. The selection of participants of focus groups had done purposefully in order to collect rich data and to have diversity in views. Participants of focus groups discussions were of different age groups, from different hospitals and mixed of males and females. The participants of in-depth interviews were eye services providers who are expert in DR treatment.

3.4.2.1 Eligibility Criteria – qualitative part

3.4.2.1.1 INCLUSION

- For in depth interview, the inclusion criteria: the DR health care expertise providers who had more than 5 years of experience in DR treatment and is working at the study settings.
- For focus groups, the inclusion criteria were DM patients with DR regardless the stage of it, who had treated at one of the studying settings.

3.4.2.1.2 EXCLUSIONS

- DR healthcare providers who have experience of less than 5 years.
- For focus groups, DM patients with eye problem other than retinopathy are excluded from the study.
- In addition to non-cooperative and unconscious patients.

3.5 Data collection

3.5.1 Quantitative data

Face to face interview- based questionnaire was conducted by well-trained interviewers who were well- trained in using questionnaire. The interview was carried out with each participant in separated, comfortable room, after getting their written consent. The participants were allowed to withdraw from the study at any time. They were informed that their participation or not will not affect the services they received at the hospital. The average time for filling the questionnaire was about 20 minutes. The data were collected after translating the questionnaire to Arabic.

3.5.2 Qualitative data

3.5.2.1 Key informants (healthcare providers)

The Researcher collected the data through interviews with key eye-service providers which were carried out in the study settings or other places preferred by them after clarifying the purpose of the interview and took approval from them to take part in the discussion. The data were collected through audio recording and note was written down and the transcript was done immediately after the meeting to ensure accuracy.

3.5.2.2 Focus groups with DR patients

The Researcher collected the data form focus groups with DR patients who were treated in the study settings after clarifying the purpose of the interview, to ensure accuracy of the data the researcher participated it with DR patients of both sexes, suffering from DR at different stages and form different age groups. The data were collected through audio recording and notes were down and the transcript was done immediately after the meeting to ensure accuracy.

3.6 Instrument/tools: Quantitative study

3.6.1 Questionnaire

The quantitative data were collected through face-to-face interview questionnaire (**Annex 9)**, the questionnaire developed according to the research specific objectives, and was

reviewed and modified by experts to increase the validity of the content. The following components were included in the questionnaire:

- Sociodemographic and economic variables: place, age, gender, marital status, education level, working status, monthly income, family assistance, the reason for today visit.
- Medical information: duration of DM, family history, duration of DR, interval since diagnosis of DR, mode of treatment, co-morbidities, last DR screening, last laboratory analysis.
- Patient level of awareness: DM complications, DM impacts on patient's eyes, the importance of regular eye screening, the relationship between HGA1c level and development of DR.
- System factors including: medical system, waiting time and pathways, Patient-provider interaction
- Outcomes of DR services: follow-up.
- Patient satisfaction.
- Retinopathy dependent quality of life tool (RetDQoL).

3.6.2 Patient satisfaction tool

The Retinopathy Treatment Satisfaction Questionnaire (RetTSQ) is standardized international tool used to evaluate patients' satisfaction with the treatment areas they receive for their DR, which consists of 13 splits into two subscales: one used to evaluate positive aspects of treatment, and the other to evaluate negative aspects. The RetTSQ is rated on 5- point scale, ranging from 0 (least positive option, e.g., very dissatisfied) to 4 (most positive option, e.g., very satisfied). The questionnaire measures the overall satisfaction with current treatment, how well the treatment works, side effects, discomfort/pain, unpleasantness of treatment, ease/difficulty of the treatment, apprehension about the treatment, patient influence on the treatment, safety of the treatment, time consuming, received information about treatment, encouraging others with diabetic eye problems and continuity of treatment (Karadzic et al., 2020). In previously conducted cross-sectional study by Karadzic and colleagues (2020) to validate the RetTSQ in Serbian community, the Cronbach alpha coefficient results for the subscales were 0.783 for the

positive scale and 0.811 for the negative scale (Karadzic et al., 2020). Additionally, the RetTSQ was also translated to Arabic.

3.6.3 Retinopathy dependent quality of life tool (RetDQoL)

Evaluation patient's quality of Life enable collecting data that can't be collected using routine data collection ways. The RetDQoL tool is an individualized tool measures the impact of diabetic retinopathy on quality of life taking into account the relevance and importance of different aspects of life for quality of life of individuals as well as the individual's view of the impact of diabetic retinopathy on each aspect of life of relevance to them (physical, functional, social, and psychological health) (Milne et al., 2012). Moreover, RetDQoL tool is suitable for administration by face-to-face interview or phone interview. However, the scores maybe differ according to the used method.

The measure starts with one overview item, ("present QoL"), the participants were asked to complete the statement "In general, my present quality of life is:" using a 6-point scale ranging from "excellent," to "very bad,". The domain-specific items including 20 items covering different domains of life divided into two main groups basing on their impacts, to physical and mental quality of life, using 5- point scale ranging from 0 (least positive option, e.g., worse) to 4 (most positive option, e.g., very much better) (Milne et al., 2012). Previously conducted research by Milne and colleagues (2012) to assess the diabetic retinopathy treatment including assessing the diabetic retinopathy dependent quality of life by using RetDQoL, the Cronbach's α reported in the research was 0.958 for weighted impact scores for all domains; while Cronbach's α for unweighted impact scores and the importance ratings were 0.96, 0.84, respectively (Milne et al., 2012). Additionally, the RetDQoL tool was also translated to Arabic.

Pilot study

To assess the appropriateness and the reliability of the study tools, a pilot study for 35 patients was carried out in order to give the Researcher chance to revise the questionnaire basing on the outcomes of the pilot study. Then, the reliability of the questionnaire was tested. Basing on the result, minor modifications were done including rephrasing a few questions, changing the order of some questions, adding new questions, and removing

other irrelevant questions to increase the reliability. The 35 piloted cases were excluded from the study sample.

3.7 Instrument/tools: Qualitative study

3.7.1 Focus group

To fulfill the requirement of the study and to triangulate the source of data collected for the study, five focus groups discussion with 30 DR patients were carried out. On average, each focus group had 6 participants. In addition to five in depth interviews with the key eye services providers were conducted. The qualitative approach was used to gather, review and understand the data that couldn't be described by numbers.

3.8 Ethical and managerial consideration

The ethical and administrative considerations are very important conditions in applying the research or performing any medical procedures. The following measures were followed:

- Administrative approval was obtained from Al Quds University.
- Ethical approval was received from Helsinki committee (**Annex 3)**
- An official letter was obtained from the general director of MoH hospitals in order to conduct the study in governmental hospitals and facilitate the process of data collection (**Annex 4**).
- An approval was obtained from the head Quarter of SJEH in Jerusalem to conduct the study in SJEH branch in Gaza.
- Administrative approval was obtained from studying settings. **(Annex 5).**
- Participants of focus group and in-depth interview were asked for their permission to record the interviews.

3.9 Scientific rigor: quantitative part

3.9.1 Reliability

The following steps were done to assure instruments reliability:

- Data collectors were trained on the purpose of the study, how to select the study participants, and the way of asking questions. This assured standardization of questionnaire filling.
- Then, the data entered in the same day of data collection allow possible interventions to check the data quality or to re-fill the questionnaire when required.
- Re-entry of 5% of the data after finishing data entry to ensure correct entry procedure and decrease entry errors**.**
- Data were checked for internal consistency of its domains to demonstrate the appropriate clustering of items. Each domain was individually assessed using Cronbach's alpha, the standard statistical technique for assessing the coherency of each item within each domain.

Table (3.2): The breakdown of Cronbach's Alpha

Domains	**Chronbach 's Alpha**
Client's provider interaction: DR service providers	0.722
Satisfaction for DR treatment: RetTSQ	0.762
Participant's perspectives about the availability services	0.622
Retinopathy Dependent Quality of Life (RetDQoL)	0.930
The reliability for the whole questionnaire	0.804

3.9.2 Validity

Face Validity

It refers to the transparency or relevance to the tool in collecting the needed data. To ensure the appropriateness of the questions, the clarity of the wording and to allow smooth data collection and easy data entry.

Content Validity

The questionnaire was evaluated by experts to assess its relevance **Annex (17),** and their comments were incorporated. Also, a pilot study was conducted before the actual data collection to examine the response to the questionnaire and how they understanded it. This enhanced the validity of the questionnaire after modifying it to be better understood.

3.10 Scientific rigor: qualitative part

Trustworthiness

First, a peer check was done through experts to revise the in-depth interview questions to assure that they covered all the required dimensions. Then, a member check was done to assure accuracy and transparency of the transcripts during the interviews. Prolonged engagement was done as the Researcher tried to probe for answers to cover all the interview dimensions properly.

In addition, recording the interviews enhanced tracking up facts and re-check the accuracy of the transcripts. Finally, all the transcripts and recordings were kept for tracking the information by others at any time (Audit trail).

3.11 Data analysis

3.11.1 Quantitative data analysis

During data collection, the Researcher reviewed the questionnaires continuously and before entering them to ensure valid information. The Researcher used the statistical Package for Social Sciences version 25 for data coding, entry and analysis, then followed by checking the collected data from errors as missing data. After that the data was entered

through the mode that was prepared, Re-entry test was performed with 5% of the data, data cleaning was performed to check illogical values, then the processing of this data was established.

Descriptive statistics were carried out to describe the basic characteristics of the sample. In the study the researcher concerned the Diabetic retinopathy as the dependent variable and (place, gender, marital status, education level, working status, family assistance, the reason for today visit, type of DM, family history, perceived weight, co-morbidities) as the independent categorical variable, and (age, monthly income, duration of DM, duration of DR) as continuous variables.

Moreover, patient-provider interaction and patient level of awareness were analyzed by measuring the weighted mean, which obtained by summing the weighted impact scores of all applicable domain-specific items and dividing the result by the number of applicable domains.

The RetTSQ was analyzed after assessing the normality of the data by using K.S test. The test showed that the data were normally distributed with (K. S=0.504, P=0.129). By then, the RetTSQ was analyzed as a continuous variable not categorical. The RetTSQ does not propose or recommend cut-off points to categorize the satisfaction level into satisfied or not. The ReTSQ was analyzed by measuring the weighted mean, which obtained by summing the weighted impact scores of all applicable domain-specific items and dividing the result by the number of applicable domains. Moreover, correlation was used to assess the relationship between satisfaction scores and different variables, either categorical or scaled variables. Moreover, the RetDQoL tool was analyzed after assessing the normality of the data by using K.S test. The test showed that the data were normally distributed with (K. S=0.413, P=0.102). By then, RetDQoL tool was analyzed by dividing the section items into two main groups physical and mental, then each group is analyzed separately by measuring the weighted mean, which obtained by summing the weighted impact scores of all applicable domain-specific items and dividing the result by the number of applicable domains. Finally, the overall mean of the whole questionnaire was also measured.

One –way ANOVA test used to measure the statistical differences between selected dependent variables (patient level of awareness, patient-provider interaction, patient

satisfaction, availability of services and retinopathy dependent quality of life) and governorate.

Person correlation test was used to examine whether there were statistically significant differences between selected dependent variable and the following independent variables: participants' age, years of schooling, income, years of suffering from DM and DR.

T-test was conducted to examine whether there were statistically significant differences between selected dependent variable and the following independent variables: study participants' marital status, gender, type of DM, co morbidities and having other DM complications.

One –way ANOVA test was conducted to examine the statistical differences between selected dependent variables and the following independent variables: working status and taking DM medication regularly.

3.11.2 Qualitative data analysis

Open coding thematic analysis method was used to analyze the transcripts of key health providers and DR patients' interviews. The Researcher started by obtaining the main findings from the transcripts of patients and key informant interviews and deep reading of data extracted from the transcripts, then notes were taken to identify the important items. The Researcher then started with the open coding thematic analysis method through the categorization of related ideas. Then comparisons and integration between the quantitative and the qualitative findings were conducted to create rich items for discussion.

3.12 Limitation of the study

- Personal interview questionnaire was expensive and time consuming.
- Difficulties in collecting data from three hospitals.
- Limited resources including funds and facilities for data collection and data entry.
- Corona Pandemic delayed data collection.
- Unstable political situation delayed the study.

Chapter Four

Results and discussion

Introduction

This Chapter illustrates the results of statistical analysis of the quantitative and qualitative data, including descriptive analysis that summaries the socio- demographic characteristics of the study participants and the answers to the study questions. The Researcher used different statistical tests including frequency distributions, mean, median and standard deviation to analyze the questionnaire variables. The inferential analysis examines the relationship between selected variables and other selected covariates. Throughout this Chapter, quantitative and qualitative findings will be presented as in the conceptual framework: patient factors, system factors, DR services provision and outcomes of DR services.

4.1 Descriptive analysis

4.1.1 Patient factors

4.1.1.1 Demographic characteristics of the study participants

As shown in Figure (4.1), 44.8% of the study participants were from Gaza governorate, 24.3% from Khanyounis, 14.6% from North Gaza governorate, 8.9% from Deir Albalah, while 7.4% from Rafah governorate.

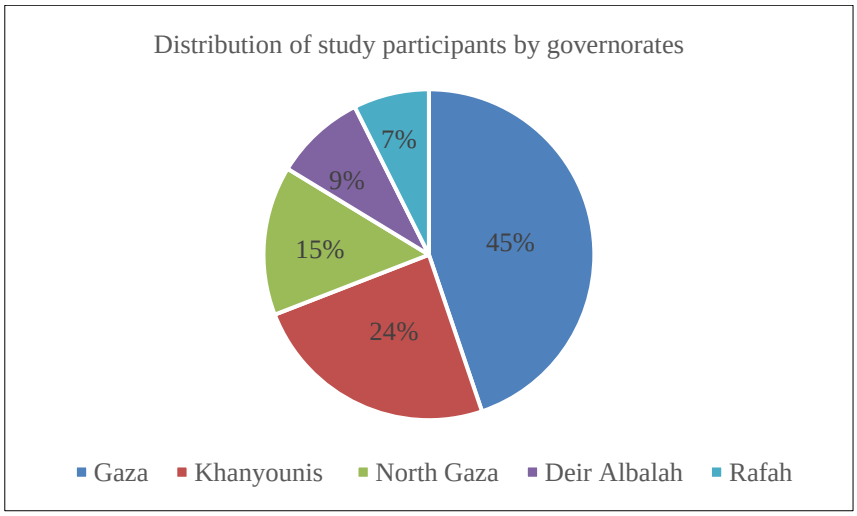

Figure (4.1): Distribution of study participants according to governorates

Figure (4.2) showed that, 59.9% of the study participants received the treatment from Al Naser Ophthalmic Hospital, 35.9% from St. John Hospital, 30.0% in European Gaza Hospital, while only 4.5% from Private Hospitals.

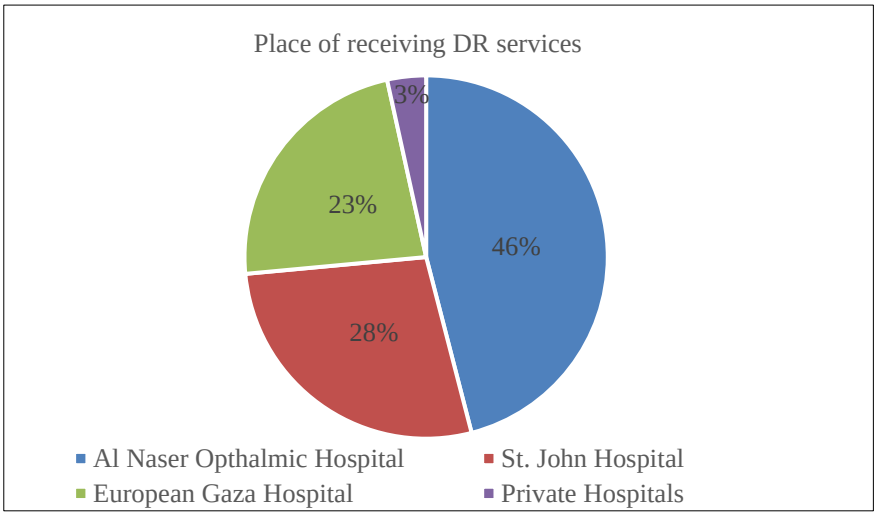

Figure (4.2): Distribution of study participants according to place of receiving DR services

With regard to the age of the study participants, Table (4.1) shows that, the mean age of the participants was 59.18 years old, with (SD 10.39). Breakdown of the study participants by age groups shows that 21.4% of participants aged 50 and less, 33.4% aged between 51 to 60 years, and 45.2% aged 61 and above. This finding is consistent with Hammad (2019) study, in which 75% of the diabetic participants aged more than 50 years (Hammad, 2019).

Regarding gender, 54.5% of the study participants were male, while 45.5% were female. Most of them were married at the time of data collection (79.5%), and only 20.5% were unmarried at the time of data collection, including being single, widowed, and divorced.

The mean years of schooling was 12.19 years, represented as follow: 31.6% of the study participants had less than 12 years of schooling, 33.2% had 12 years of schooling and 35.1% had more than 12 years of schooling. This result is inconsistent with Palestinian Central of Bureau of Statistic (PCBS), in which having less than 10 years of schooling represent 38.3% and having 10 to 12 years of schooling ranging represent 33%, while having 13 years or more represent 28.7% (PCBS, 2021).

Regarding working status, 73.8% of the study participants were unemployed at the time of data collection, 8.5% were retired, while only 17.8% were working. The breakdown of employment status by gender shows that 31% of females' participants were employed at the time of data collection compared to 69% of males' participants, this finding reflects the fact of the low participation rate of females in the labor market. This finding is in line with the low percent of female participation in the labor market in the GS (19%) as reported by PCBS (PCBS, 2019).

With regard to monthly income, the median was 1,000 ILS, with SD (1,169.48). According to PCBS, the relative poverty line and the deep poverty line in 2017 (for reference household consisted of 2 adults and 3 children) were ILS 2,470 (USD 671), and ILS 1,974 (USD 536), respectively (PCBS, 2017). Of the study participants, 76.4% were under the poverty line, while only 23.6% of them were above the poverty line. Unlike what was reported by PCBS, in which almost one out of three individuals were living below the poverty line (29.3%) (PCBS, 2017).

Table (4.1): Distribution of the study participants according to selected sociodemographic variables

Items	**No.**	**%**
Place of receiving DR treatment (*)		
St. John hospital	145	35.9
Al Naser Ophthalmic hospital	242	59.9
European Gaza Hospital	121	30.0
Private Hospital	18	4.5
Total	**526**	**130.3**
Age groups		
50 and less	86	21.4
51 to 60	134	33.4
61 and above	181	45.2
Total	**401**	**100**
Mean age: 59.18, Median: 60.0, SD: 10.39		

Table (4.1): Continued

Gender		
Male	220	54.5
Female	184	45.5
Total	**404**	**100.0**
Marital status		
Not Married	82	20.5
Married	318	79.5
Total	**404**	**100.0**
Years of schooling		
Below 12 years	119	31.6
12 Years	125	33.2
Above 12 years	132	35.1
Total	**376**	**100.0**
Mean years of schooling:12.19, Median:12.00, SD:3.64		
Working status		
Yes	71	17.8
No	295	73.8
Retired	34	8.5
Total	**400**	**100.0**
Monthly income, Poverty line of 1845 ILS (**)		
Under the poverty line	197	76.4
Above the poverty line	61	23.6
Total	**258**	**100.0**
Mean income:1377.89, Median:1,000, SD:1169.48		

* Receiving DR treatment from more than one provider.

**** Not all the participants answered their monthly income.

4.1.1.2 Distribution of the study participants according to their medical history

4.1.1.2.1 DM medical history

4.1.1.2.1.1 Type and duration of DM

As shown in Table (4.2), the predominant type of diabetes among study participants was DM Type II with 88.1% compared to 11.9% of DM Type I. This finding is closely related to the prevalence of diabetes in Palestine as reported by the World Diabetes Foundation (WDF), in which 95.3% of the total diabetic patients were diagnosed with type 2 diabetes compared to 4.4% were diagnosed with type 1 diabetes (WDF, 2020).

Regarding duration of DM, the mean years since being diagnosed with DM was 13.07 years, about 27.9% of the study participants had DM for less than 10 years, 20.4% of them had DM for 10 years, 39.8% of them had DM for duration ranging from 11 to 20 years and the rest of them (11.9%) had DM for more than 20 years. The result is consistent with Giloyan and Colleagues (2015) study, who reported that duration of diabetes is strongly associated with developing DR, about 76.7% of patients with DM for more than 20 years are diagnosed with DR regardless the grade of glycemic control (Giloyan et al., 2015).

4.1.1.2.1.2 Family history

More than half of the study participants had another family member suffering from DM, mainly mother (49%), father (35.6%). This finding reflects the fact that having other family member with DM increases the risk to develop DM (Center for Disease Control and Prevention-CDC-, 2020). See Table (5.2)

4.1.1.2.1.3 Treatment modalities

Regarding treatment modalities, around half of the study participants (52.7%) used Insulin as treatment modality to control their blood glucose level. On the other hand, 49.5% of the study participants used oral hypoglycemic agents. Less than half of study participants followed diet (27.2%) and lifestyle (12.1%) modalities as well. See Table (5.2)

4.1.1.2.1.4 Overweight and obesity

A total of 56.1% of the study participants described their weight as being overweight or obese. The result reflects the fact that obesity and overweight become an endemic in Palestine especially among females with prevalence of 64.1%. Unsurprisingly, UNRWA reported that 90% of diabetic patients are either obese or overweight. Being overweight raise the risk of having DM complications, and weight loss is the first line in treatment DM (Sharif & Imam, 2019). See Table (5.2)

4.1.1.2.1.5 Co-morbidities

The study findings show that 40.3% of the participants suffered from other chronic diseases along with their diabetes. As expected, 92 % of the study participants suffered from hypertension, 28.8% of them suffered from heart diseases, and 1.8% of them suffered from Chronic Obstructive Pulmonary Disease (COPD). See Table (5.2)

4.1.1.2.1.6 Complications

Regarding DM complications, 15.8% of the study participants suffered from another DM complications as peripheral neuropathy, with (41.9%), from Diabetic Foot, with (17.7%), and from Nephropathy, with (14.5%). See Table (5.2)

4.1.1.2.1.7 Medication adherence

Regarding medication adherence among diabetic patients, several studies have reported low to medium adherence to medications (Sharif & Imam, 2019). However, in this study patient's adherence is 90% compared to 10% who didn't do so. Adherence to medication is very important but isn't the only thing to control blood sugar level, many other factors such as diet control, lifestyle modifications and drug's potency markedly contribute in the effective management of DM. So, the whole process should be revised to improve the patient's outcomes, and to reduce complications. This result is in line with focus groups discussion, in which the majority of focus group participants depend mainly on medications for controlling their DM, while only few of them followed lifestyle changes, namely diet management. From participants point of view the regular administration of medication is the main factor to control blood sugar level, however they complained from

the frequent run out of medicines especially at governmental centers and buying it from private pharmacies weren't affordable for most of them.

The majority of the study participants regularly visit primary health centers either for receiving medication or to do lab analysis, however their blood sugar was uncontrolled.

One participant stated, "*I take my medication regularly, but my blood sugar is high*" (55 years old female treated at NOH). Another participant stated "*I buy one tape of my medication and I take it day by day in order to keep it for longer period, as I can't buy more*" (62 years old male treated at EGH).

Additionally, the majority of them agreed with the importance of lifestyle changes to control their blood glucose level. However, most of them found exercises difficult to them due to their DR, linking this to their loss of independency and the changes in the social and emotional well-being. One participant stated, "*I am afraid of walking, I can't see, how can I play exercises*" (66 years old female treated at SJEH).

Regarding diet management, all focus groups participants agreed with the importance of diet management on controlling DM. Some of them said that they take responsibility of their diet and follow diet management plan. While the rest of them said maintaining a healthy diet is difficult, as stated by one of the study participants, "*I can't stay away from sweet things; every forbidden thing is desired*" (72 years old male treated at SJEH).

Table (4.2): Distribution of the study participants according to their DM medical history.

Items	**No.**	**%**
Type of diabetes		
Type I	48	11.9
Type II	356	88.1
Total	**404**	**100.0**
Years of suffering from DM		
Less than 10 Years	112	27.9
10 Years	82	20.4
From 11 to 20 Years	160	39.8
Above 20 Years	48	11.9
Total	**402**	**100.0**
Mean:13.07, Median:11.00, SD:7.44		

Table (4.2): Continued

Other Family Suffering from DM		
Yes	208	51.5
No	196	48.5
Total	**404**	**100.0**
Type of treatment modality		
Insulin	213	52.7
Oral medication	200	49.5
Diet control	110	27.2
Lifestyle	49	12.1
Perceived weight		
Overweight	162	40.6
Underweight	63	15.8
Normal weight	112	28.1
Obese	62	15.5
Total	**399**	**100.0**
Having other chronic diseases		
Yes	163	40.3
No	241	59.7
Total	**404**	**100.0**
Type of chronic diseases		
Hypertension	150	92.0
COPD	3	1.8
Heart diseases	47	28.8
Other	4	2.5
Having another DM complications		
Yes	64	15.8
No	340	84.2
Total	**64**	**100.0**
Type of the other DM complication		
Peripheral neuropathy	33	53.2
Diabetic foot	11	17.7
Nephropathy	9	14.5
Sexual impotence	6	9.7
Other (Hearing, cardiac, pack Pain)	3	4.8
Total	**62**	**100.0**
Take DM medicines regularly		
Yes	364	90.3
No	9	2.2
Somewhat	25	6.2
Often	5	1.2
Total	**403**	**100.0**

4.1.1.2.2 DR medical history

4.1.1.2.2.1 Duration of DR

As shown in Table (4.3), the mean of period of diagnosis with DR was 4.23 years. More than half of the DR cases (56.3%) had DR for duration ranging from 2 to 5 years, 24% of them had DR for more than 5 years, and 19.7% of the study participants had DR for one year and less.

4.1.1.2.2.2 History of received DR services

A total of 66.3% of the study participants said that the physician advised them to consult their ophthalmologist for eye complications of diabetes, 88.4% the ophthalmologist advised the study participants to do eye check-up at least once every year, 96.0% of the participants have done DR screening, and 60.7% of them did it 2 years ago. See Table (5.3). These findings are consistent with Alluhaymid and Colleagues (2020) study, who reported that 40.5% of the participants weren't referred by the primary physician, and 70% of the participants did eye checkup one year ago (Alluhaymid et al., 2020).

A total of 88.0% of the study participants received feedback about that DR screening compared to 12% did not received feedback, 36.5% of them agreed with receiving feedback had effect on their DM management plan while 62.0% disagreed. See Table (5.3).

In addition to, 24.5% underwent retinal surgery in the last year, 59.3% of them did it in SJEH, 14.3% in NOH and 9.9 % in Dar Al Salam Hospital. Moreover, 9.9% of the participants underwent laser treatment in the last year, 50.0% did it in EGH and 25.0% did it in SJEH.

4.1.1.2.2.3 History of hypertension (HTN)

A total of 38% of the study participants suffered from uncontrolled hypertension, 32.5% controlled but not all the time while 29.4% were controlled most of the time. The mean years of suffering from HTN was 11.68 years, the 41.1% of the hypertensive clients have it for more than 10 years. See Table (5.3). This result appears to prove the results reported in other studies indicating the negative impact of uncontrolled blood sugar level and blood pressure on DR progression, so tight controlling of both is considered cornerstone in prevention of and controlling DR (Amer et al., 2021).

Table (4.3): Distribution of the study participants according to their DR medical history

Item	No.	%
Period of diagnosis with DR		
One year and less	78	19.7
From 2 to 5 Years	223	56.3
More than 5 Years	95	24.0
Total	**396**	**100.0**
Mean:4.23, Median:4.00, SD:3.65		
Physicians advise you to consult ophthalmologist		
Yes	268	66.3
No	118	29.2
I don't know	18	4.5
Total	**404**	**100.0**
Advised to do eye check-up at least once every year		
Yes	357	88.4
No	37	9.2
I don't know	10	2.5
Total	**404**	**100.0**
Conducting DR screening		
Yes	388	96.0
No	16	4.0
Total	**404**	**96.0**
Last time of conducting DR screening		
1 year and less	112	28.9
2 Years	127	32.8
3 Years	84	21.7
4 Years and more	64	16.5
Total	**387**	**100.0**
Mean:2.49, Median:2.00, SD:1.87		
Received feedback about that DR screening		
Yes	355	87.9
No	49	12.1
Total	**404**	**100.0**

Table (4.3): Continued

The feedback has affected your diabetic management plan		
Yes	129	36.5
No	219	62.0
I don't know	5	1.4
Total	**353**	**100.0**
Undergone retinal surgery for diabetes in last year		
Yes	99	24.5
No	305	75.5
Total	**404**	**100.0**
Undergone laser treatment for diabetic retinopathy in the last year		
Yes	40	9.9
No	356	88.1
I don't know	8	2.0
Total	**404**	**100.0**
Have hypertension that is under control		
Yes, most the time	48	29.4
yes, but not all the time	53	32.5
Not at all	62	38.0
Total	**163**	**100.0**
Years of having hypertension		
5 and less	45	27.6
From 6 to 10	51	31.3
From 11 to 15	30	18.4
More than 15	37	22.7
Total	**163**	**100.0**
Mean:11.68, Median:10.00, SD:8.24		

4.1.1.2.3 Distribution of the study participants according to their level of awareness about DR

As shown in Table (4.4), the mean of awareness of the study participants was 86.70%. Fortunately, 97.5% of the participants knew that diabetes has negative impact on their eyes, which was higher than the percentage reported by Alluhaymid and Colleagues (2020) study by (82.6%) (Alluhaymid et al., 2020), 91.8% of them knew that controlling blood sugar level could preserve their vision. About 88% of them believed that diabetes could lead to loss of vision, which was higher than the percentage reported by Alluhaymid and Colleagues (2020) study by 73.4% (Alluhaymid et al., 2020). Additionally, 84.2% of the study participants believed that their connection between HGA1c level and DR progression, while only 80% of them believed that lifestyle modifications to control the blood glucose level could affect DR progression.

With regard to the awareness about eye screening, 89.1% of the study participants agreed on the importance of conducting annual eye checkup compared to 10.9% disagreed. Unlike Kumar and Colleagues (2020) study, only few participants were aware about DR, the importance of regular eye checkup and the importance of controlled blood sugar on preserving their vision (Kumar et al., 2020).

Unfortunately, study findings revealed that there is still gap in the knowledge, especially in knowing the negative impact of diabetes on vision and the high risk of vision loss when participants had uncontrolled diabetes, in this study, 12.9% of the participants either didn't know or disagreed with the relation between diabetes and their vision. Moreover, 15.9% of the study participants either didn't know or did not believe that there is a relation between HGA1c and DR progression, 20% of them didn't know or disagreed with the positive impact of lifestyle modifications on controlling blood sugar level, and 22.8% of them either didn't know or disagreed with the importance of conducting eye checkup when they had controlled blood sugar level.

However, when participants were asked about how good was their blood sugar control, 10.2% of them said it was excellent, 42.9% very good, 33% good, 11.4% fair and 2.5% poor. While when they asked about how happy they were about their DM knowledge on scale from 1 to 5, 52.7% of the participants said 1, 6.7% said 2, 9.5% said 3, 13.4% said 4 and 17.7% said 5.

This result reflects that our study participants weren't satisfied with the information they have and in need for information about DM, including complications. This finding is inconsistent with Yahya and Colleagues (2020) study, in which lack of awareness or knowledge about DR represent one of the most important reasons behind not coming early or not following regular annual DR screening (Yahya et al., 2020).

Focus group participant's discussions revealed that some of the patients were aware about DM complications but they when they asked about DR many of them did not expect it happened to them and its impact would as severe as it was when happened. The majority of participants knew that diabetes affects their eyes through interactions with doctors. Unfortunately, no one reported that he/she been informed about the risks on their eyes on account of diabetes or the precautions that they need to take to protect their eyes, until they had been diagnosed with DR, they reported that their doctors gave them some precautions to protect their eyes from further deterioration.

Additionally, the majority of participants reported that after the appearance of symptoms they started to follow up their eyes in the hospital, and their primary healthcare providers did not inform them about the importance of annual checkup even before symptoms appearance.

They also spoke about the importance of eye care, of regular eye checkup and the importance of controlling blood sugar level to preserve their vision. One participant stated" "*After feelings of discomfort in my eyes, I came by myself to check them*" (63 years old female treated at NOH).

Form healthcare provider point of view, the DR awareness among patients was still limited, despite of their knowledge about the effect of diabetes on their eyes, they were more familiar with other eye problems like cataracts, and many of them were unaware about DR, and from their opinion patients either remained unaware about DR and blamed their doctors for failing in educated them, or aware but didn't follow up their eye screening as they didn't suffer from symptoms. Moreover, slow improvement in vision after initiation of treatment may also hindered many of them to continue the care, as stated by one participant ""*Due to the slow improvement in vision patient's stop following their eye care, explaining this due to feeling that treatment was ineffective, but he did not know that maintaining stable state and prevent further deterioration is improvement*" (55 years old doctor at NOH).

Table (4.4): Distribution of the study participants about level of awareness about DR

Items	No.	%
Do you believe that diabetes can affect your eyes		
Yes	394	97.5
No	5	1.2
I do not know	5	1.2
Total	**404**	**100.0**
Do you believe that controlling your blood sugar can help preserve your vision		
Yes	371	91.8
No	10	2.5
I do not know	23	5.7
Total	**404**	**100.0**
Do you believe that diabetes can lead to loss of vision		
Yes	355	88.1
No	12	3.0
I do not know	36	8.9
Total	**403**	**100.0**
Do you believe that there is link between HGA1c and DR progression		
Yes	340	84.2
No	20	5.0
I do not know	44	10.9
Total	**404**	**100.0**
Do you believe that lifestyle modification measures can affect DR progression?		
Yes	323	80.0
No	38	9.4
I do not know	43	10.6
Total	**404**	**100.0**
Do you think it is important for diabetic patients to check their eyes annually		
Yes	359	89.1
No	44	10.9
Total	**403**	**100.0**
Do you think that you need to do eye checkup when your blood sugar is controlled		
Yes	310	77.1
No	46	11.4
I do not know	46	11.4
Total	**402**	**100.0**
Mean of Awareness = 86.70, Median = 100.0, SD = 18.14		
How good do you believe your blood sugar control is		
Excellent	41	10.2
Very good	173	42.9
Good	133	33.0
Fair	46	11.4
Poor	10	2.5
Total	**403**	**100.0**
On a scale of 1-5 how happy would you say you are with your knowledge about diabetes?		
1	205	52.7
2	26	6.7
3	37	9.5
4	52	13.4
5	69	17.7
Total	**389**	**100.0**

4.1.1.2.4 DR screening barriers from patient perspectives

There are many DR screening barriers that patients may face and could hinder them from getting regular eye screening, Figure (4.3) shows that, 33.7% of the study participants reported that the absence of family support prevent them from regularly follow up their appointment, followed by the cost barrier either the transportation cost or the cost/insurance coverage as expressed by 24.3%, 23.3% of the study participants, respectively.

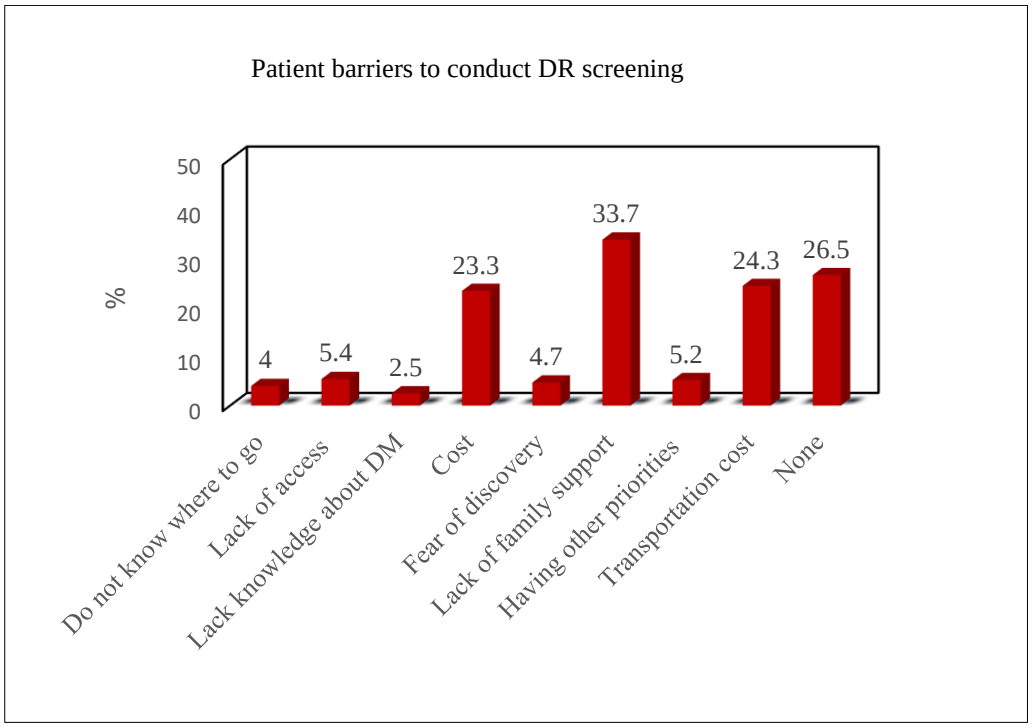

Figure (4.3): DR screening barriers from patient perspectives

This result is comparable with Piyasena and Colleagues (2019) study, that revealed the importance of studying patient's family context including marital status, importance of having accompany, and household income, and how this affects patient decision making and action towards healthcare services. Especially for elderly patients who rely on other family member for addressing their health needs, since there are limited social protection mechanisms along with the deteriorating economic status (Piyasena et al., 2019).

With female clients, the situation is more complicated besides their lack of power and authority, they are unwilling to use the family limited income, and to be a burden on others forced them to miss or delayed their appointments (Piyasena et al., 2019).

However, 26.5% of the study participants had no barrier to access the eye care services neither physical barrier nor financial barrier, fearing from losing vision force them to overcome any barrier and regularly follow up their eyes. This finding reflects the affordability and accessibility of governmental and non-governmental health services. However, sometimes patients have to pay for SJEH services in the absence of funds to cover the cost of the services.

This result is consistent with focus group discussion, in which many participants reported that lack of family support especially in patient with advanced stage of DR, and after using diagnostic eye drop prevents patients from regularly follow up their appointment, as stated by 69 years old male participant treated at SJEH "*After diagnostic eye drop has been applied, vision has blurred, I can't see and it became worse with sun light*". Followed by, having other priorities *"taking care of my family sometimes hindered them from following my appointment*" (65 years old female treated at NOH). This finding is consistent Yahya and Colleagues (2020) study, who reported that lack of assistance especially due to eye drop side effects and during transportation were barriers to completing DR screening (Yahya et al., 2020).

4.1.2 DR Services provision

4.1.2.1 Availability of screening tests at hospitals

Figure (4.4) showed that, 61% of the study participants strongly agreed with the availability of follow up tests, followed by 18% agreed with the availability of follow up tests, followed by 11% disagreed with the availability of follow up tests, followed by 6% natural with the availability of follow up tests and 4% strongly disagreed with the availability of follow up tests. A total of 84.4% of the study participants reported that screening test is always available at the hospitals where the data were collected, while 15.6% of them didn't agree with the continuous availability of screening tests at the hospital where they followed up their DR problems, either because the camera was broken down, or the absence of the doctor due to COVID 19 epidemic.

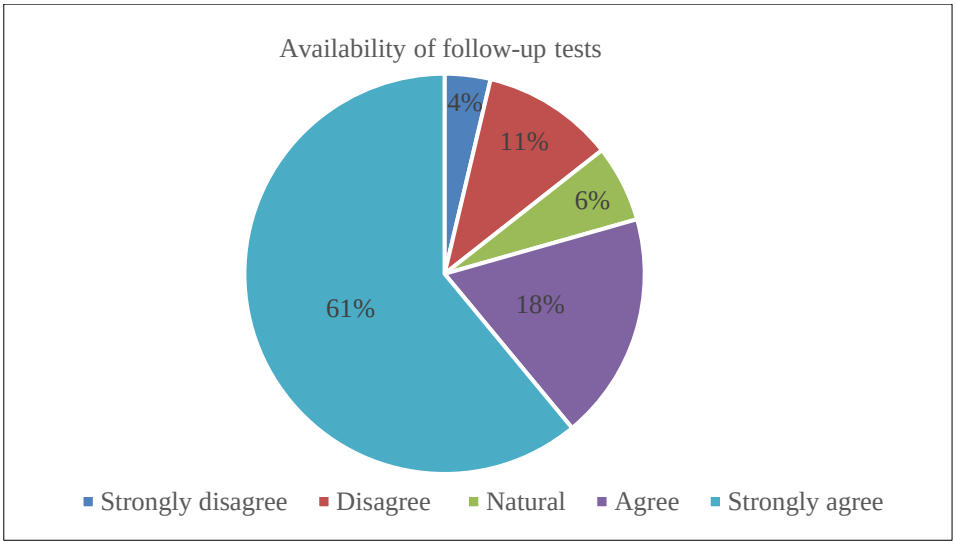

Figure (4.4): Distribution of the study participants according to their perspective about the availability of follow up tests

4.1.2.2 DR services Follow up

4.1.2.2.1 Reasons for today's visit

As shown in Table (4.5), the most common reason of the study participants' visit was scheduled appointed to follow up (73%), followed by to do diagnostic tests (19.6%), and followed by walk-ins-visit (5.2%).

4.1.2.2.2 Distribution of the study participants according to services Follow up

Table (4.5) shows that, 86.4% of the study participants conduct their follow up visits regularly, compared to 13.6% of them didn't do so, because of the following reasons: 52.1% of the participants reported that transportation cost restrained them from regularly attend their appointment, 20.8% said that they didn't have time, 14.6% of them said that difficulty in their movement, and 6.3% of them their need of accompany prohibit them from follow up their appointment.

Regarding the number of follow up visits per year, 37.8% of the study participants visited the hospital 3 times and less, 50.4% of them visited the hospitals from 4 to 6 times per year, and 11.8% of them visited hospitals for more than 6 visits per year.

According to the ADA guidelines, patient with type 2 diabetes should undergo eye screening at the time of diagnosis of DM, and annual checkup is recommended, however

in case of absence of evidences on DR existence, screening every two years may be recommended. While patient with type 1 diabetes should undergo eye screening within five years of diagnosis (Liu & Swearingen, 2017). Moreover, it is important to mention that the optimal interval between follow up visits should weigh patient individual risk, cost–effectiveness and affordability of the screening program (WHO, 2020).

With regard to the adequacy of their follow up visits the participants described it from their point of view as follow: 58% of them said it was adequate, 30.3% of them said it was adequate to some extent, while 11.7% of them said it wasn't adequate.

However, when participants were asked about if they had been approached by the providers when they didn't follow up their appointment regularly, most of them (82.6%) said that they had never been approached by their health providers.

Figure (4.5) shows, once again financial hardship represents the most common barrier for participants regular follow up and commitment to their appointment, which is not only affects the DR management process, but it also affects DM management through reducing patient's ability to afford healthy food, access health services, thus, and force them to live in stressful psychosocial environment associated with the adoption of unhealthy lifestyle, which indeed negatively impact their health outcomes and quality of their life (Hyman et al., 2017).

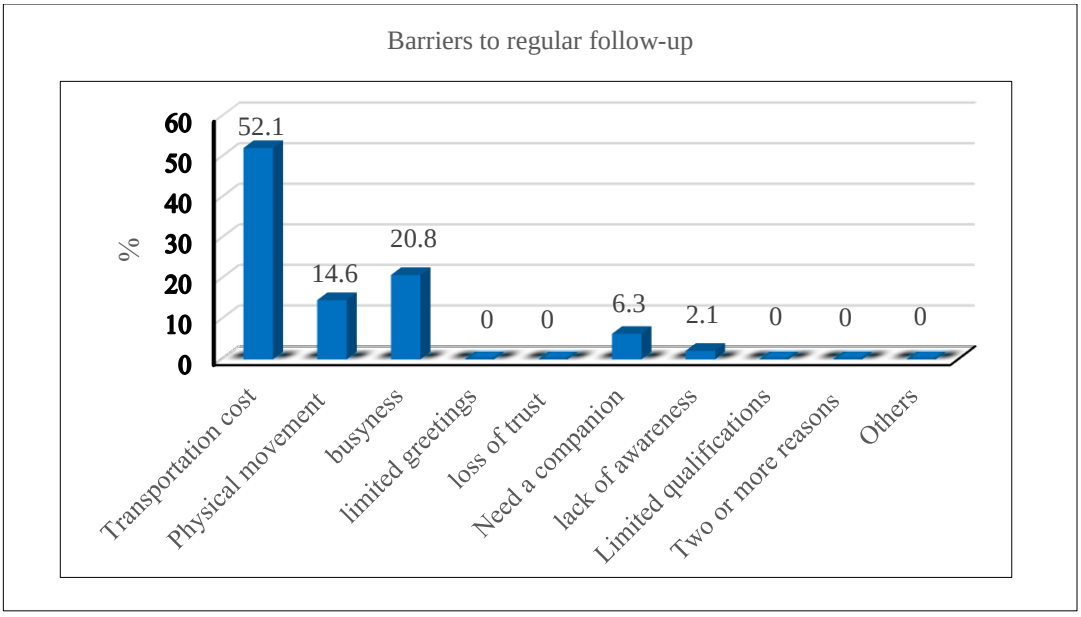

Figure (4.5): Patient's barriers to regular follow up

Many approaches were applied to improve patient's attendance to their appointments such as reminder system either by phone calls or messages to remind patients of their appointments, in addition to follow missed appointment to know the reason and to book new one, this result in significant reduction of missed appointments (Sun et al., 2021).

Table (4.5): Distribution of the study participants according to follow up

Items	**No.**	**%**
Do you regularly conduct follow up visits to check the DR status		
Yes	349	86.4
No	55	13.6
Total	**404**	**100.0**
Number of follow up visits per year to follow the DR status		
Three visits and less	151	37.8
From 4 to 6 visits	201	50.4
More than 6 Visits	47	11.8
Total	**399**	**100.0**
Mean:4.51, Median:4.00, SD:2.30		
Do you think that your follow-up visits are adequate		
Yes	233	58.0
To some extent	122	30.3
No	47	11.7
Total	**402**	**100.0**
Have you been approached by provider because you do not follow up regularly?		
Yes	70	17.4
No	332	82.6
Total	**402**	**100.0**

4.1.2.2.3 Laboratory tests

Regarding laboratory tests, Table (4.6) shows that, 86.1% of the study participants did annual laboratory analysis regularly compared to 13.9% who didn't do so. The mean of the last lab analysis was 2.30 months. Most of participants (89.9%) received feedback about the results of their annual laboratory tests compared to 8.6% who did not receive any feedback and 1.9% did not know if they received feedback or not. This result is consistent

with focus group discussion result, in which the majority of the participants who received treatment at UNRWA's clinics said that they received feedback about their lab test and their physician change their treatment basing on their HGA1c level.

Unfortunately, only 42.3% of the study participants had controlled HGA1c compared to 53.6% had uncontrolled HGA1c, while 4.1% did not know if their HGA1c was controlled or not. About 68.5% of them the result did not affect their diabetic management plan, while only in 29.8% it did so. The mean of annually cost of the laboratory test was 54.59 ILS. This finding reflects the gap exists in management of diabetes, taking medication regularly isn't enough for proper glycemic control, it should include practices and comprehensive management approach to delay or prevent complications (Radwan et al., 2018).

A total of 13.9% of the participants didn't do lab analysis regularly and around 10.5% of them neither received nor remembered the result of the test, this result is consistent with focus group discussion, in which some participants who received treatment from governmental clinics reported that they didn't do regular lab analysis, unless they have complications. Moreover 68.5% of them the result of the test didn't affect their diabetic management plan, in despite of over half of the participants had uncontrolled HGA1c.

Many studies have revealed that a strong relation between controlling blood sugar level and the risk of diabetic complications, in which 1% reduction in HbA1c leads to 35% and 25% reduction in development of micro-vascular complications and mortality respectively (Radwan et al., 2018).

Table (4.6): Distribution of the study participants by their follow up's information

Items	No.	%
Reason of today's visit		
Scheduled appointed- follow up	294	73.0
To do diagnostic test	79	19.6
Walk-ins-visit	21	5.2
To do laboratory tests	8	2.0
To do laser	7	1.7
For surgery	2	0.5
Other	12	3.0
Conducting annual laboratory analysis regularly		
Yes	348	86.1
No	56	13.9
Total	**404**	**100.0**
Received feedback about the results of the annual laboratory analysis		
Yes	339	89.9
No	31	8.2
I don't know	7	1.9
Total	**377**	**100.0**
HG A1c result		
Controlled	153	42.3
Uncontrolled	194	53.6
I do not know	15	4.1
Total	**362**	**100.0**
The result of HG A1c have effect on diabetic management plan		
Yes	106	29.4
No	248	68.9
I don't know	6	1.7
Total	**360**	**100.0**

4.1.2.3 Self-care education

4.1.2.3.1 Availability of nutritional healthcare services at primary healthcare center

As shown in Figure (4.6), 71.5% of the study participants reported the absence of nutritional services in the primary healthcare services where they receive their medical healthcare service, while only 14.1% of them agreed with the existence of the service, and 14.1% of them didn't know if the service offered or not on the primary centers where they got their medical services.

On one hand, these findings shed the light on the gap exists in the knowledge offered by the center about the different services that they offered. On the other hand, it reflects the marginalized role of nutritional healthcare services in Gaza's primary healthcare centers and if it exists it mainly preformed through the distribution of printed materials by nurses that had other priorities in their point of view than reading or discussing nutritional issues with DM patients (Sharif & Imam, 2019).

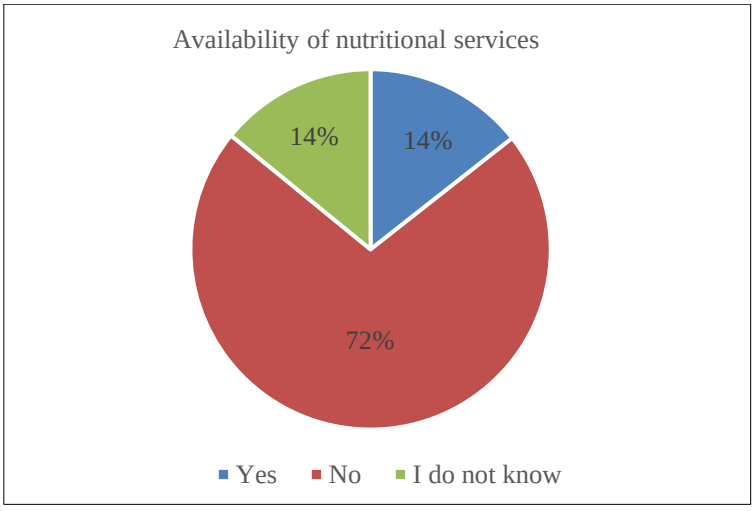

Figure (4.6): Distribution of the study participants according to availability of nutritional healthcare services at primary healthcare center

4.1.2.3.2 Medical information

As shown in Figure (4.7), a total of 95.3% of the study participants mentioned that the main source of information about diabetic retinopathy was the medical team, 17.8% of them from family, 17.8% of them from friends and 14.4% from the internet.

This result is consistent with Kumar and Colleagues (2020) study, who reported that main source of information is the medical team including doctors and nurses (Kumar et al., 2020).

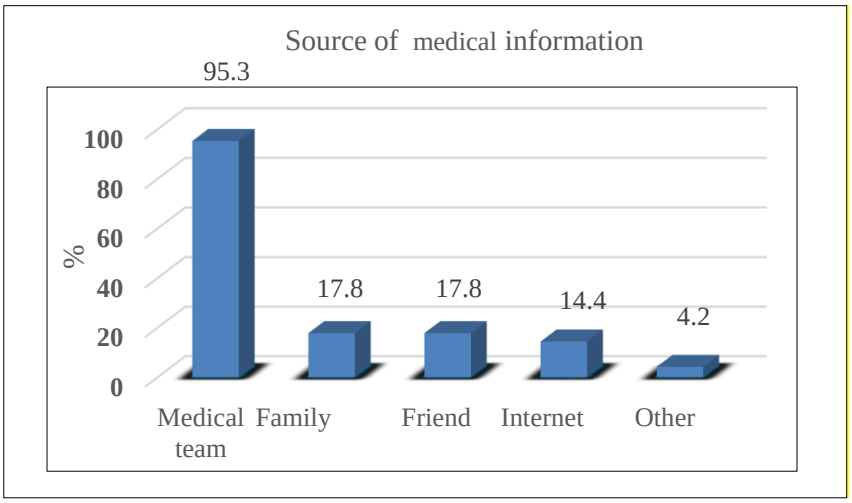

Figure (4.7): Distribution of the study participants according to the source of the medical information

4.1.3 Health care system factors

4.1.3.1 Accessibility to DR services

4.1.3.1.1 Physical and financial accessibility to DR services

As shown in Table (4.7), 70.4% of the study participants reported that it was easy to access the hospital to receive DR services, while 29.6% reported that it wasn't easy for them to access the hospital to receive DR services. A total of 4.3% of participants came on foot compared to 95.7% of them used public transportations. The mean of time they took to reach the hospital was 15.8 minutes.

The mean of the transportation cost was 10.24 ILS. 36% of the participants said that the cost was affordable for them compared to 39.5% said that they can't afford the cost and 24.5% said that sometimes they can pay.

The cost remains one of the main barriers to access healthcare services, especially in the GS in which the poverty rose to reach 53% (PCBS, 2020), along with the unemployment rate that reached 50.2% in the GS, making accessing to healthcare services more challenging (PCBS, 2021). The cost includes the cost of treatment of diabetes itself, and the cost of treatment for diabetic retinopathy including laser treatment, surgical treatment, etc. In addition to the transportation cost, all together exhausted patients, especially among poor communities, leading to missed or delayed healthcare appointments result in poor disease management (Ibrahim et al., 2015).

It is important to notice that, having safe, reliable and affordable transportation is one of the most fundamental social determinants of health (National Center for Transit Research -NCTR-, 2018). Unfortunately, more detailed data about the impact of transportation cost on services utilization is limited, all previous studies included it into the treatment cost.

Table (4.7): Distribution of the study participants according to accessibility of healthcare services

Items	No.	%
Was it easy to reach to this hospital		
Yes	283	70.4
No	119	29.6
Total	**402**	**100.0**
Do you come on foot		
Yes	17	4.3
No, I used transportation	381	95.7
Total	**398**	**100.0**
If yes, how long it takes you to arrive		
10 and less	9	56.3
From 11 to 29	2	12.5
30 and above	5	31.3
Total	**16**	**100.0**
Mean:15.88, Median:10.00, SD:12.301		
If no, you used transportation, how much do you pay (back and forth)		
5 and less	69	18.4
From 6 to 10	210	56.1
More than 10	95	25.4
Total	**374**	**100.0**
Mean:10.24, Median:8.00, SD:8.73		
Do you think the cost you paid is affordable?		
Yes	132	36.0
No	145	39.5
Sometimes	90	24.5
Total	**367**	**100.0**

4.1.3.1.2 Affordability of DR services in the GS

Table (4.8) shows that only 55% of the study participants agree with the affordability of the DR services to most of the people across the GS.

With regard to the reasonability of the cost, Table (4.8) illustrates that 40.2% of the participants were neutral with reasonability of the cost paid to receive the service, followed by 19.9% of them agreed with the reasonability of the cost, followed by 18.7% of them disagreed with the reasonability of the cost, followed by 12.4% of them strongly agreed with the reasonability of the cost, and 8.8% strongly disagreed with the reasonability of the cost.

This result is comparable with the percent of unemployed study participants in the sample which is 73.8%. Once again, the cost of treatment represents one of the main barriers to access DR services as most of patients are old and/or unemployed and so they can't incur the cost of treatment alone without assistance from others.

Table (4.8): Distribution of the study participants according to cost affordability and reasonability

Paragraph	Strongly disagree		Disagree		Natural		Agree		Strongly agree		Weighted Mean%
	No.	%	No.	%	No.	%	No.	%	No.	%	
The services in this hospital affordable to most people across the GS	91	26.7	53	15.5	84	24.6	76	22.3	37	10.9	55.0
The fee/cost you pay to receive the services is Reasonable	29	8.8	62	18.7	133	40.2	66	19.9	41	12.4	76.0

4.1.3.2 Availability of ophthalmology services

4.1.3.2.1 Availability of ophthalmology services at primary healthcare center

As shown in the Table (4.9), 58.2% of the study participants mentioned that there is an ophthalmology clinic in the primary healthcare center where they receive their healthcare services. This finding is consistent with the number of refugees in the sample as UNRWA's clinics provide annual fundus examination for diabetic patients, unlike governmental primary healthcare centers in which such service is not available yet (IAPB, 2018).

On the other hand, 31.7% of the participants said that there wasn't an ophthalmology clinic in the primary healthcare center where they got their healthcare services, compared to 10.1% didn't know if their center offers the service or not.

4.1.3.2.2 Availability of different types of services at places of data collection

The main type of services participants received at the place of data collection was the follow up (85.7%), followed by counseling (63.9%), followed by surgery (10.1%), followed by laser (8%), followed by medication dispensing (6.7%), and finally for doing lab tests as follow up (5.5%). See Table (5.9)

4.1.3.2.3 Availability of DR medication

A total of 53.7% of the study participants received their DR medications from UNRWA, the second common source of medications to dispense the medication was the private pharmacies, with 45%, followed by governmental primary healthcare centers, with 20.5%, followed by 18.1% from NOH, followed by 17.6% from SJEH, followed by 3% from EGH, and 3% from private hospital. Regarding the monthly cost of DR medications, the median was 100 ILS and SD 125.28. See Table (5.9)

4.1.3.3 Duplication of the healthcare services

The study illustrates that 24.5% of the study participants received services from different places other than the place where the data were collected, represented as follow 7.1% received services from Al Salam hospital, 8.1% from EGH, 14.1% at NOH, 7.1% don't remember where, 31.3% at SJEH, and 32.3% at UNRWA. While 75.5% of them received services only at the place of data collection. See Table (5.9)

Table (4.9): Distribution of the study participants according to availability of healthcare services

Items	No.	%
In the primary care center where you get the health care services, is there an ophthalmology clinic		
Yes	235	58.2
No	128	31.7
I do not know	41	10.1
Total	**404**	**100.0**
For DR, do you receive services from places other than this hospital		
Yes	99	24.5
No	305	75.5
Total	**404**	**100.0**
If yes, from where do you receive these services		
Al Salam	7	7.1
EGH	8	8.1
Eyes Hospital	14	14.1
Not remember	7	7.1
St. John	31	31.3
UNRWA	32	32.3
Total	**99**	**100.0**
What kind of services do you receive from this hospital		
Counseling	152	63.9
Follow-up	204	85.7
Lab tests	13	5.5
Medication dispensing	16	6.7
Surgery	24	10.1
Laser	19	8.0
From where do you get your DR medications		
St. John hospital	71	17.6
Naser ophthalmic hospital	73	18.1
European Gaza Hospital	14	3.5
Private hospitals	12	3.0
Governmental Primary Health Care center	83	20.5
UNRWA	217	53.7
Private Pharmacy	182	45.0
How much do you pay on monthly basis by ILS		
Zero	80	20.2
From 1 to 50 ILS	91	22.9
51 to 100 ILS	70	17.6
More than 100 ILS	156	39.3
Total	**397**	**100.0**
Mean of monthly DR medications payment:112.88 ILS, Median:100 ILS, SD:125.28		

4.1.3.4 Waiting time & Pathway

As shown in Table (4.10), from the study participants point of view, the mean waiting time to receive eye care service was 57.02 minutes, with SD (30.06 minutes), 14.5% of the study participants waited less than 30 minutes, followed by 43.9% waited from 31 to 59 minutes, and 41.6% waited one hour and more. A total of 35.6% of the study participants said that the total time consumed was reasonable, 58.9% of them said it was lengthy, while only 5.4% of them said it was short.

Moreover, 12.9% of the study participants reported that they waited long waiting list when they needed to preform specific procedure, followed by 71.2% of them waited to some extent, compared to 15.9% reported that they didn't do so.

However, when they asked if their doctor asked them about the time that suits them, 75.9% of them said that their doctor never asked them about the time that suits them. While when they asked about doctors' commitment to the appointment that they gave to them, 69.2% of them reported that they committed to the appointment all the time, followed by 27.3% reported that they committed sometimes, and only 3.5% of them refused.

During the follow up visit, 34.4% of participants mentioned that they waited for long time to see the doctor, followed by 43.9% of them agreed to some extent, compared to 21.7% of them mentioned that they didn't wait so long to see the doctor.

Regarding lab test analysis, around half of the study participants said that they didn't wait so long to preform lab test analysis, while the rest of them either strongly agreed or agreed to some extent that they waited so long to perform the lab tests analysis. About 69.1% of the study participants didn't wait so long to dispense their medications compared to 29.9% of them did so.

Regarding the main barrier that participants faced during the visit, Figure (4.8) shows that the most common barrier was limited availability of therapy options, with (34.4%), followed by crowdedness of the hospital, with (18.8%), followed by lack of specialized services, with (17.6%), followed by poor staff communication, with (17.3%), followed by long waiting time, with (10.1%). However, 58.7% of them said that they didn't face any barrier during their visit.

Most of the study participants (95.5%) reported that they didn't return home without receiving service one year ago, compared to 4.5% of them said that they sometimes did so.

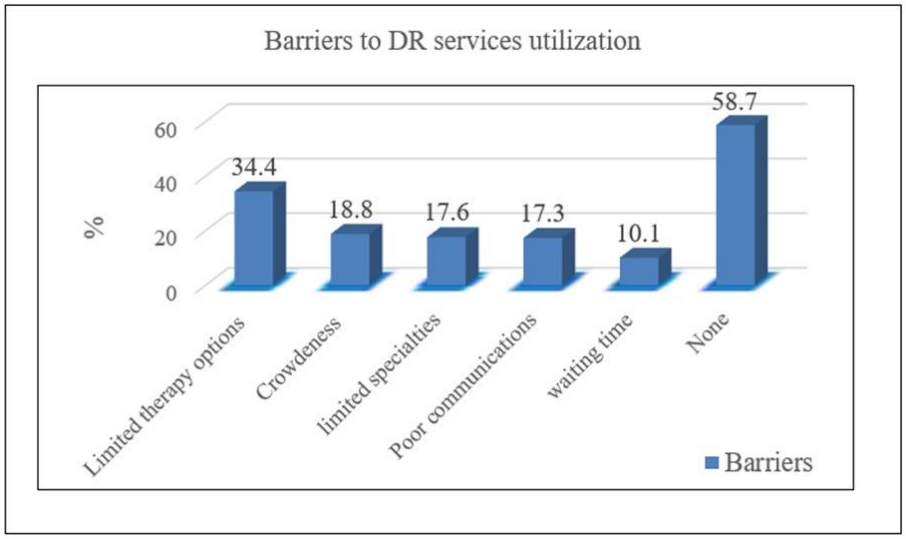

Figure (4.8): Barriers to DR services utilization

It worthy to mention that waiting time wasn't considered as problem for most of the study participants, because most of them were old and unemployed and their appointment gave them chance to keep socialized and connected with other patients. Unlike Ibrahim and Colleagues (2015) study, in which the long waiting time was one of the main patients complains that made them unwilling to come to the clinic again, not only the patient but it may also make family or friends who joined the patients not willing to come again because of opportunity cost of income or time lost (Ibrahim et al., 2015).

Also, long waiting time negatively affects the patient's satisfactions to the rendered care, which in turn affects health outcomes and quality of the care provided to the patients, and improving it is fundamental issue to improve the quality (Alrasheedi et al., 2019).

The result of qualitative research is inconsistent with the quantitative results, in which the main barrier from patient's point of view, was the cost of the services, despite having governmental health insurance patients still incurred additional cost especially when referrals are made either for SJEH or abroad.

Moreover, the majority of focus group participants weren't satisfied with waiting time, they said that they spend the whole day waiting for their turn, from their point of view this due to physician poor adherence to appointments and lack of specialized eye services puts the load on one physician and so make patients wait so long to see physician for receiving care or follow up.

Other participants mentioned that lack of commitment to the given appointment plays role in elongating waiting time. One participant stated" "*I came at 7:30 a.m., and I am still waiting to see the doctor*" (72 years old male participant treated at SJEH). Followed by, 68 years old male participant treated at SJEH stated" "*There is only one specialized doctor, he sees at least 40 patients daily"*. Another participant stated" "*If we all adhere to our appointment, waiting time will reduce*" (55 years old female treated at SJEH).

This finding is consistent with Kumar and Colleagues (2020) study, who reported that long waiting time at clinics one of the major deterrents of DR care seeking (Kumar et al., 2020).

In addition to inadequate human and medical resources, the majority of the participants reported shortage of medicine especially at governmental hospitals, and lack of experts and sub-specialties, forcing them to buy medication and services from private sectors and bear the burden of additional cost. Otherwise, patients treated at SJEH complains from the price of the medications and the absence of insurance coverage for it. 70 years old male treated at EGH stated" "*I didn't find my eye drop here, and if it available my health insurance didn't cover it, so I have to buy it from private pharmacies, sometimes I could but other times I couldn't buy it."* Another participant stated" "*I always find my eye drop at* SJEH*; however, the price is the same as the private, it should be cheaper in such charitable institution, shouldn't it*?" (68 years old male treated at SJEH), followed by, one other participant stated" "*Due to lack of sub-specialty, I have to wait the whole day to see the only available specialist doctor*" (71 years old female treated at SJEH).

This finding is consistent with Yahya and Colleagues (2020) study, who described that shortage of specialized doctors to preform DR screening elongate waiting time forcing patients to prefer treatment at private clinics, and bear additional cost. However, not all patients could afford it especially people at low socioeconomical status (Yahya et al., 2020).

Table (4.10): Distribution of the study participants according to waiting time & pathways DR hospital services

Items	No.	%
Generally, how many minutes do you wait to receive the services from the hospital by minutes		
30 and less	56	14.5
From 31 to 59	170	43.9
60 and more	161	41.6
Total	**387**	**100.0**
Mean:57.02, Median:50.0, SD:30.06		
From your point of view, do you think the total time consumed during the visit is		
Reasonable	144	35.6
Lengthy	238	58.9
Short	22	5.4
Total	**404**	**100.0**
If you have to do specific procedure in the hospital, was there a long waiting list before your turn?		
Yes	52	12.9
To some extent	287	71.2
No	64	15.9
Total	**403**	**100.0**
Did the doctor ask you about the time that suits you		
Yes	97	24.1
No	305	75.9
Total	**402**	**100.0**
Is your doctor committed to the appointment that they give to you?		
Yes, all the time	279	69.2
Yes, sometimes	110	27.3
No	14	3.5
Total	**403**	**100.0**
In case of hospital visit for a follow-up, do you wait for a long time to see the doctor		
Yes	138	34.4
To some extent	176	43.9
No	87	21.7
Total	**401**	**100.0**
If you have to perform lab tests in the hospital, did you wait for a long time to get the services		
Yes	28	9.6
To some extent	107	36.8
No	156	53.6
Total	**291**	**100.0**
If you dispense your medications from this hospital, do you wait for a long time to get the services?		
Yes	6	2.1
To some extent	82	28.8
No	197	69.1
Total	**285**	**100.0**
In the past year, have you been returned home without receiving the services		
Yes (Covid -19, Absent of Physician)	18	4.5
No	386	95.5
Total	**404**	**100.0**

4.1.3.5 Health insurance

Unfortunately, only 29% of the study participants reported that health insurance covered all the cost associated with DR treatment, while about two-thirds of them didn't report so. Figure (4.9) shows that 71% of the study participants strongly disagreed with the complete health insurance coverage to the services, followed with 17% disagreed, and 9% were neutral. This finding is consistent with Yahya and Colleagues (2020) study, about diabetic retinopathy screening barriers in which he reported that despite the availability of governmental health insurance, patient still incurred cost especially for medication or treatment as they are uncovered by the insurance.

This force patients to priorities their needs, and to spent money on the most important things. Most of patient wait until symptoms appearance to do eye- check or to buy medication, which lead to diagnose them at late stage of DR, result in poorer outcomes. This fact underlines the lack of awareness about the importance of annual check even before the appearance of symptoms (Yahya et al., 2020).

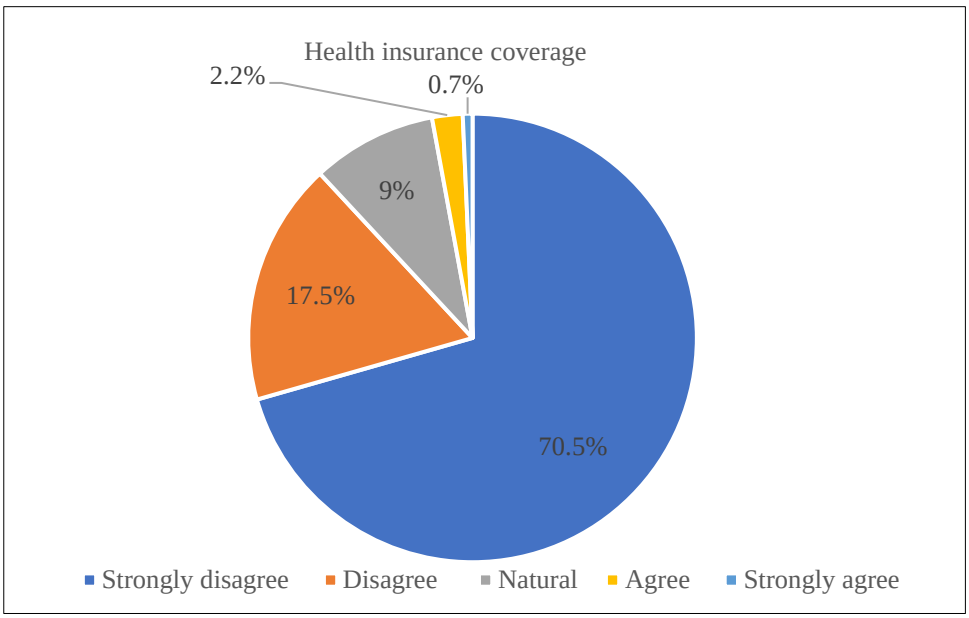

Figure (4.9): Distribution of the study participants according to participant's perspective about health insurance coverage

Many focus group participants mentioned that inadequate health insurance coverage is one of the fundamental barriers to access health services, especially in case of absence of needed services at public hospitals, they have to receive it from private sectors at unaffordable cost to people at low socioeconomic status. One participant stated" "*My health insurance doesn't cover the cost of treatment; I still have to pay for injections and medications, and sometimes I couldn't pay I borrow money from my relatives"* (74 years old female treated at NOH).

This finding is consistent with Yahya and Colleagues (2020) study, who reported that having governmental health insurance wasn't enough patient still incurred part of the cost especially when referral was made or for medications, forcing patients to think twice before accessing DR services (Yahya et al., 2020). However, other focus group participants said that they hadn't any barrier, and their fear from losing their vision force them to overcome any obstacles.

4.1.3.6 Availability of protocols and clinical guidelines

Regarding the availability of protocols or updated clinical guidelines for management of DR, doctors at governmental hospital reported lack of protocols and updated clinical guidelines and their disease management depends on their perceptions and experiences. However, physicians at SJEH Hospital mentioned that they have clinical guidelines and protocols they depend on it, in addition to the international diplomas and specialized courses that they received to provide specialized eye services and to reduce referrals. One participant stated" "*The MoH latest clinical guidelines to manage chronic diseases was in 2000, unit now it wasn't updated or replaced by new one"* (55 years old doctor at EGH). Another participant stated" "*We manage cases basing on our experiences, we haven't any guidelines that could support our judgment so we deal with patients' case by case"* (58 years old doctor at NOH). Followed by, 56 years old doctor at SJEH stated" "*Here in* SJEH *hospital, we have international guidelines according to which our doctors manage cases beside select some of them to take international diplomas and training to provide specialized services, for such services patients refereed to receive it in west bank or Egypt".*

4.1.3.7 Referral system

From healthcare provider point of view, accessing tertiary care is one of the human rights, however, the weakness of the referral system is one of the fundamental barriers to access adequate quality of care, which patient faced in case of absence of necessary health service at public hospital, patient referred to local hospitals or abroad. Unfortunately, poor coordination between referral farcicalities and delays to get permission negatively impact patient's outcomes, as stated by 56 years old doctor at SJEH "*Patients have to wait too long to receive coverage or permission to continue their treatment due to restriction of movement*".

4.1.3.8 Barriers to access from healthcare providers perspective

4.1.3.8.1 Service barriers

On one hand, healthcare provider at managerial position reported that the lack of adequate infrastructures, poor health information system, limited financial resources as well as fragmentation of health system, and the absence of universal policy were fundamental barriers obstacles system quality improvement process.

On the other hand, ophthalmologist doctors described that lack of clear communication channel between health facilities, and patient overload deeply impact the quality of the provided care, as stated by one participant "*There are several barriers for quality of the care such as: fragmentation of the system and lack of universal policy*" (55 years old doctor at EGH). Followed by, 54 years old doctor at SJEH stated" "*I check at least 64 patients daily I try to do my best but; this overload elongate patient waiting time and negatively impacts patients contact time with us*". Another participant stated" "*Refer patients to other hospital depends on our personal relationships, there is no clear official communication system between facilities*" (52 years old doctor at NOH).

4.1.3.8.2 Political and socioeconomical barriers

Physicians at managerial position mentioned that political and socioeconomic situation in the GS directly and indirectly impacts the healthcare system, the political division between the GS and the West bank and the lack of unified decision and political commitment between the two authorities in the GS and West Bank affects the quality of healthcare system and delay the improvement process, as stated by 56 years old doctor at SJEH "*The*

political division between Gaza and West bank and the division in the health system, and lack of unified decision impede quality improvement process".

4.1.3.8.3 Personal barriers

Doctors at governmental hospitals reported that there were many personal barriers negatively impact quality of the care, the majority of the staff were burned out, they loss the passion in deliver services with acceptable quality, due to many reasons such as lack of salaries, incentives and capacity building, along with weak monitoring and supervision of staff performances. One participant stated" *"There are many barriers such as lack of salaries and incentives, shortage in training courses to improve staff performance, in addition to weak supervision of staff performance*" (52 years old doctor at NOH). Followed by, 55 years old doctor at EGH stated" "*They want us to give patients their right in treatment, while they don't give us our rights".*

4.1.3.9 Distribution of the study participants according to patient's provider interaction

As shown in Table (4.11), the mean of patient's provider interaction was 77.43, with (SD 10.97). Most of the study participants (92.2%) said that the treating physicians were polite and were dealing with them in a friendly way. A total of 89.6% of study participants said that their physicians allowed them to say what they thought it was important without interrupting them, 88% of them reported that their physicians were willing to help them, 81.6% said that their physicians told them the truth about their DR problem, 80.6% of them reported that they received feedback about their retinal examination results, and 84% of them said that they had confidence in the medical team.

Unfortunately, on the other hand, 17.4% of the study participants said that their treating physicians didn't make sure that they understood his/her instructions and explanations, 12% of them reported that their doctors were not interested in helping them, only 46.6% of the them said that their physicians used to use language difficult for them to understand, 43.6% of them said that their physicians didn't explain the advantage and disadvantage of treatment modalities, 54.8% of them said that their physicians didn't involve them in the decision making related to their DR treatment plans, 19.2% of them didn't receive feedback about their DR tests, and 16% of them weren't confident in the medical team.

With regards to receiving feedback after DR services, the majority of the participants said that their ophthalmologist explains their situation. However, some of them weren't satisfied with the information given to them, explaining that due to the high workload, and lack of some specialty. The vast majority of them said that ophthalmologist didn't take their opinion in choosing the treatment regimen.

Many studies have illustrated the important role of patient- provider interactions in disease self-management, strengthening patient-provider communication and patient participation in decision making process related to their treatment enhance patient satisfaction, increase adherence to treatment plans and thus improve health related outcomes (Hyman et al., 2017). Building a positive patient–provider has great influence on patients' regular attendance, willingness to learn and change their lifestyle and treatment adherence (Dao Julie et al., 2019).

Many of focus groups participants reported problems in patient -provider interaction process, they reported that they didn't receive enough details about their diagnosis and didn't understand medical terms often used by their providers. Additionally, most of them reported that their health providers didn't participate them in the decision-making process.

Also, most of participants reported short contact time with healthcare providers, despite of waiting for long time to see him, from participants point of view this related to overcrowding of patients at the hospital in comparison to number of available health providers.

While the rest of participants reported adequate health provider interaction. From Researcher point of view this related to patient level of awareness about the disease and its complications which is affected by many factors, for instance patient's educational level, patient with higher educational level read more about their disease and ask more questions compared to patient with lower educational level depends on information given from their provider. Moreover, severity of the disease impacts patient-provider interactions, patients with moderate to severe stages were worrier and afraid from further deterioration of their eyes so they asked more questions to make sure that everything is good. One participant stated" *"My doctors only said that your situation is stable, and give the date of the next follow up"* (69 years old female at NOH). Another participant stated" *"My doctor decide that I need injection in my eye and give me date to receive it"* (60 years old male at SJEH).

Table (4.11): Distribution of the study participants according to patient's provider interaction: DR service providers

Paragraph	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		Weighted Mean
	No.	%	No.	%	No.	%	No.	%	No.	%	%
Your physician is polite and deals with you in a friendly way.	15	3.7	0	0.0	7	1.7	85	21.0	297	73.5	92.2
During this visit, you were allowed to say everything that you think is important without interrupting you	4	1.0	8	2.0	18	4.5	133	32.9	241	59.7	89.6
The physician makes sure that you understand his explanations and instructions	4	1.0	26	6.4	45	11.1	146	36.1	183	45.3	83.6
The physician is always willing to help you	7	1.7	15	3.7	29	7.2	112	27.7	241	59.7	88.0
It is common that your physician uses a language difficult for you to understand without adequate explanation.	126	31.3	119	29.5	79	19.6	57	14.1	22	5.5	46.6
Your physician explains the advantages and disadvantages of the treatment modality	52	12.9	111	27.5	131	32.4	77	19.1	33	8.2	56.4
Your physicians involve you in the decision-making related to your treatment	132	32.7	107	26.5	103	25.5	50	12.4	12	3.0	45.2
Your physician told you the truth about your DR problem	9	2.2	22	5.4	60	14.9	158	39.1	155	38.4	81.2
You receive feedback about the results of these retinal tests	19	4.7	21	5.2	53	13.1	144	35.6	167	41.3	80.8
You have confidence in the medical team	23	5.7	18	4.5	51	12.6	75	18.6	237	58.7	84.0
Mean = 77.43, Median 80.0, SD = 10.97											

4.1.4 Distribution of the study participants according to output/outcome of DR services

4.1.4.1 Quality of services

As shown in Table (4.12), all the study participants will recommend the DR treatment for any of their relatives and friends when they suffer from DM. Of the total study participants, 51.6% of them reported that the services met their expectations, 44.2% of them reported that the services met their expectations to some extent. While 4.2% of the study participants reported that the services didn't meet their expectations, in which all mentioned that they expected it to be better than that.

The unstable political situation along with deteriorated economic situation across the GS limit the available treatment opinions forcing patients to accept the services as is and be grateful of having it and didn't aspire to have better than the available one.

Table (4.12): Distribution of the study participants according to the quality of healthcare services

Would you recommend the treatment for your DR problem to any of your relatives and friend		
Yes	403	100.0
No	0	0.0
Total	**403**	**100.0**
Have diabetic retinopathy services that you received met your expectation		
Yes	208	51.6
To some Extent	178	44.2
No	17	4.2
Total	**403**	**100.0**
If no, how did you expect the services to be?		
Better	17	100.0
Worse	0	0.0
Total	**17**	**100.0**

4.1.4.2 Patients' satisfaction

Treatment satisfaction, measures to which degree the treatment meets or exceed the patient's personal expectations, considered as one of the main factors affecting patient adherence to medications and being part of several patient-reported outcomes, that is used to assess how disease and medication impact patient well-being, functioning, and everyday life (Khdour et al., 2020). Table (4.13) shows that, the study participants satisfaction with the provided DR services represented with mean of 73.68 (SD12.38).

In the satisfaction domain, the highest satisfaction was observed in the treatment of DR problem, with(88.6%), followed by the satisfaction in treatment to a degree allow them to encourage someone else with DR to have the same treatment, with (85.4%), followed by the satisfaction in the effectiveness of the DR treatment, with (82.6%), the least satisfaction was observed in the apprehension of the treatment of DR problems, with (47.4%), followed by the difficulty of DR treatment, with (47.8%), followed by the time taken to treat DR problem, with (72.8%), followed by the satisfaction with the information provided to them about DR problems.

In this study the mean of satisfaction is considered good, however the fact is been masked, the actual satisfaction is low, the majority of participants supposed to be satisfied with the given services either because they had no other options, due to limited available resources, and any other treatment options in private clinics or referrals, patients have to endure part or all of the cost depending on having or not health insurance. It could also be as the majority of study participants were old and had co-morbidities and so they have lower expectations of the available treatment. This finding is in line with Karadzic and Colleagues (2020) study, who revealed that elderly people had more health problems and lower expectations of treatment, therefore they are more likely to be satisfied with treatment (Karadzic et al., 2020).

Moreover, the study revealed that the lower satisfaction was reported in the DR treatment apprehension and difficulty, this result is consistent with Karadzic and Colleagues (2020) study who reported that most of the diabetic patients were unsatisfied with pain and discomfort associated with DM treatment complexity and complications (Karadzic et al., 2020).

It is worth to note that waiting time wasn't considered as problem for participants, this result is in line with Karadzic and Colleagues' study who reported that waiting time wasn't negatively impacting treatment satisfaction (Karadzic et al., 2020). It could be that majority of the study participants were relatively not young and unemployed and form their point of view their appointment is considered not only for follow up their retinal disease but also to be socialized and connected with other clients.

Moreover, some of focus groups participants were not satisfied with quality of the given treatment and they said that the given treatment worsens their situation instead of improving it.

Regarding patient satisfaction to the given information, the majority of focus group participants were unsatisfied, and explaining that the medical team is the main source of information about their disease, however physicians weren't too forthcoming and they didn't spend enough time with patients describing to them their situation, forcing them to depend on other sources such as internet or their diabetic relatives or friends.

With regard to the safety of treatment, the vast majority of participants were unsatisfied with the safety of the services, they reported sometimes it was safe but other times it wasn't. One participant stated while crying" "*I lost vision after eye surgery*" (62 years old female treated at SJEH). Unfortunately, they have nothing to do due to the weak accountability system and limited available choices they have. Another participant stated" "*I asked the doctor to stop while he was removing surgical stitches he refused, then he screamed at me go away, after this I went to other doctor, he said that I couldn't do anything, you lost vision*" (65 years old female at SJEH). Other participants were lucky and treatment to somehow improved their vision. From the Researcher point of view this mix picture may related to the severity of the disease in which patients at late stage of DR displayed lower satisfaction in compared to those at early or less sever stages.

Table (4.13): Distribution of the study participants according to their satisfaction with the provided services

Paragraph	Very Dissatisfied		Dissatisfied		Natural		Satisfied		Very Satisfied		Weighted Mean
	No.	%	No.	%	No.	%	No.	%	No.	%	%
You are satisfied with the treatment for your diabetic eye problems	14	3.5	8	2	21	5.2	106	26.3	254	63	88.6
You feel the treatment for your diabetic eye problems is working well	9	2.2	32	7.9	36	8.9	147	36.5	179	44.4	82.6
You feel the treatment for your diabetic eye problems is difficult for you	106	26.3	125	31	104	25.8	43	10.7	25	6.2	47.8
You feel apprehensive about the treatment for your diabetic eye problem	117	29	128	31.8	88	21.8	32	7.9	38	9.4	47.4
You are satisfied with the safety of the treatment for your diabetic eye problem	9	2.2	39	9.7	81	20.1	141	35	133	33	77.4
You are satisfied with the time taken by the treatment for your diabetic eye problem	21	5.2	60	14.9	78	19.4	129	32	115	28.5	72.8
How satisfied are you with the information provided about the treatment for your diabetic eye problems?	12	3	21	5.2	84	20.8	136	33.7	150	37.2	79.4
You encourage someone else with diabetic eye problems like yours to have treatment similar to yours	6	1.5	12	3	43	10.7	148	36.7	194	48.1	85.4
You are satisfied with the treatment to the extent that you will continue or repeat the treatment for your diabetic eye problem	10	2.5	14	3.5	52	12.9	185	45.9	142	35.2	81.6
Mean:73.68, Median:75.56, SD:12.38											

- **Quality of life**

Quality of life has been widely used to assess the outcome of care for patient with chronic diseases, DR is not an exception. The WHO defines quality of life as an individual's perceptions of their life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns (Megari, 2013).

4.1.4.3 Distribution of the study participants according to Retinopathy Dependent Quality of Life

Figure (4.10) shows the study participants distribution according to the current Retinopathy Dependent Quality of Life (RetDQoL). The (RetDQoL) questionnaire is individualized measure that widely used to measure the impact and the importance of diabetic retinopathy on patient different aspects of life as well as the individual view of its impact on each aspect of life relevance to them (Brose et al. 2010). In this study, equal percent 29.9% was shown on both study participants who described their quality of life good or neither good nor bad, followed by 23.8% of participants described their quality of life as very good, followed by 10.4% of participants described their quality of life as bad, followed by 4.8% of participants described their quality of life as excellent, finally 1.3% of them described their quality of life as very bad.

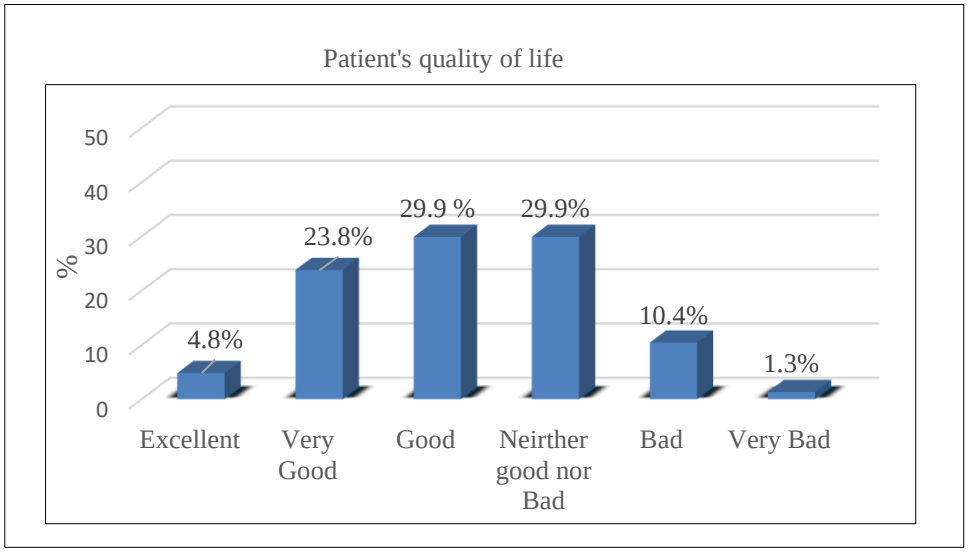

Figure (4.10): Distribution of the study participants according to the present quality of life

As shown in Tables (4.14/4.15), the retinopathy dependent quality of life was divided in two categories physical and mental quality of life. Regarding the physical quality of life, the mean was 67.91, with (SD 19.24). The highest score was observed in the participant's ability to manage their DM, 68.8% of them reported that the absence of DR problem would enhance their ability to manage their DM problems, followed by 66.2% of them reported that in the absence of DR problem, they would enjoy their vacations, followed by 65% of the participants reported that the absence of DR problem would improve their physical appearance, followed by 62% of them reported that in the case of the absence of DR problem, they would have better working life.

However, the lowest score was observed in how participants would get out and about in the case of absence of DR problems with 49.4%, this may related to the fact that the majority of the participants were elderly suffered from difficulties in movement even in the absence of any eye problems and so there wasn't huge difference between having or not eye problem in relation to their ability to get out, followed by how study participants could enjoy their leisure activity and interests in case of absence of DR problems, with (52.8%), followed by the time they would take to do things, with (54.4%) and followed by how could participants do their things independently, with (54.6%).

With regards to the mental retinopathy dependent quality of life, them mean was 62.27, with (SD 13.48). The highest score was observed in self-confidence as 75% of study participants reported that in absence of DR problem, they would have better self-confidence, followed by 66.4% of them reported better social life, followed by 66.2% reported better personal relationships, followed by 66% of participants reported that people reaction to them would improve in case of absence of DR problems. While the lowest score was observed in, if the study participants hadn't DR problems, they would have less mishaps or losing 51%, followed by how study participants could do things for others as they wish 52%, followed by participants feelings about past medical care 55.2%, and finally followed by their feelings about the future 56.2%.

Table (4.15) showed that 99.3% of the study participants reported that the questionnaire covered all the aspects of the effect of DR problems on their quality of life. These findings are inconsistent with Deswal and Colleagues (2020) study, the study illustrated that having

DR significantly affects the quality of life, and its impact increased with increasing the severity of the disease, impairing both the physical and mental components of health-related quality of life (Deswal et al., 2020).

In this study, DR negatively impacts almost all the domains of physical health-related quality of life, with more negative impact on “DM management”, “vacations enjoyment”, “physical appearance” and “working life”, and less negative impact on “get out and about”, “leisure activity and interests”, “time used”, “personal affairs” and “household tasks”. These findings aren’t in line with Deswal and Colleagues (2020) study in which DR had more negative impact on “get out and about”, “personal affairs” and “household tasks, and less negative impact on “physical appearance, “past feelings” and “care of their diabetes (Deswal et al., 2020).

Regarding mental health-related quality of life, having DR negatively impacts almost all the domains, with more negative impact on “self-confidence”, “social life” and “personal relationships”, and less negative impact on “mishaps or losing”, “doing things for others as I wish”, “feelings about past medical care” and “feelings about the future”. This result is inconsistent with Deswal and Colleagues (2020) study, in which DR had low impact on feelings about the future (Deswal et al., 2020).

It’s worthy to note that, patients who were already experiencing significant visual impairment, their quality of life was affected almost on all facets. Their physical, social and leisure activities were limited as a result of their visual impairment. Furthermore, their daily activities such as reading, DM care activities, cooking, housekeeping and getting dressed were badly affected.

Controlling diabetes in such situation is more challenging due to the inability to read labels, exercise, test glucose levels or even administer insulin, this makes the process of controlling sugar level be more difficult and so can further impair vision and increase the likelihood of suffering from other DM complications.

This result is in line with focus group discussion result, in which more than half of the patients reported negative impacts of DR in their life, female participants reported that having DR impacted their role as mother, wife and grandmother. DR deprives them from

doing their daily activities such as cooking, sewing, cleaning, and welcoming guests, while male participants said that they couldn't drive anymore, also they could hardly use their mobiles.

Moreover, the loss and deterioration of vision was accompanied with social loss, most of participants were depressed and sad, feeling of dependency on others to preform simple issues hurts them and led them to withdraw from social situations, beside their feeling of hopeless due to the severity of their conditions along with prolong treatment and excessive cost.

One participant stated" *"I depend on my son to do the simplest things as going to the bathroom, after I had been manager of a company, this feeling kills me*" (65 years old male at SJEH).

However, other patients reported that their DR problem didn't markedly impacts their life, the reported that they used to having eye problem and they systemized their life with it.

From the Researcher point of view, DR impacts on patients' quality of life depends on the severity of it, as it increased the negative impacts increased. Patients that expressed bad quality of life were at late stage of DR (almost they loss vision), while others who reported little impacts of DR at their quality of life were at early stages, as stated by 68 years old female treated at NOH "*I get used to have DR problems and I organized my life basing on it"*.

Table (4.14): Distribution of the study participants according to Retinopathy Dependent Quality of Life (physical)

	Paragraph	Very much better		Much better		A little better		The same		Worse		Weighted Mean
		No.	%	No.	%	No.	%	No.	%	No.	%	
1	I could handle my household tasks	70	17.4	93	23.1	53	13.2	54	13.4	132	32.8	55.8
2	I could handle my personal affairs (letters, bills, etc.)	51	12.7	102	25.4	65	16.2	82	20.4	102	25.4	56.0
3	My experience of shopping would be	59	14.7	94	23.4	89	22.1	87	21.6	73	18.2	59.0
4	My work life would be	58	14.4	99	24.6	121	30.1	74	18.4	50	12.4	62.0
5	I could do things for others as I wish:	53	13.2	67	16.7	78	19.4	76	18.9	128	31.8	52.0
6	I could get out and about (e.g., on foot, or by car, bus or train):	33	8.2	66	16.4	75	18.7	109	27.1	119	29.6	49.4
7	My financial situation would be	103	25.6	60	14.9	41	10.2	65	16.1	134	33.3	56.6
8	My physical appearance (including clothes and grooming) would be:	65	16.1	128	31.8	92	22.8	78	19.4	40	9.9	65.0
9	The time it takes me to do things would be	55	13.6	83	20.6	71	17.6	81	20.1	113	28.0	54.4
10	I could do things independently	46	11.4	78	19.4	98	24.4	83	20.6	97	24.1	54.6
11	My vacations would be	64	15.9	119	29.6	112	27.9	90	22.4	17	4.2	66.2
12	I could enjoy my leisure activities and interests (e.g., reading, TV, radio, hobbies	32	7.9	104	25.8	76	18.9	67	16.6	124	30.8	52.8
13	I would find taking care of my diabetes (e.g., self-testing, medication, food, exercise	95	23.6	134	33.3	71	17.6	59	14.6	44	10.9	68.8
	Mean = 67.91, Median 58.46, SD = 19.24											

Table (4.15): Distribution of the study participants according to Retinopathy Dependent Quality of Life (Mental)

	Paragraph	Very much better		Much better		A little better		The same		Worse		Weighted Mean
		No.	%	No.	%	No.	%	No.	%	No.	%	%
14	My feelings about the future (e.g., worries, hopes) would be:	59	14.7	77	19.2	83	20.6	93	23.1	90	22.4	56.2
15	My closest personal relationship would be	63	15.7	119	29.6	123	30.6	75	18.7	22	5.5	66.2
16	My self-confidence would be	109	27.0	150	37.2	88	21.8	46	11.4	10	2.5	75.0
17	I would have mishaps or would lose things	22	5.5	69	17.1	96	23.8	136	33.7	80	19.9	51.0
18	My feelings about past medical care and/or self-care (e.g., anger or regret) would be:	27	6.7	82	20.3	124	30.8	108	26.8	62	15.4	55.2
19	My friendships and social life would be	50	12.4	149	37.0	112	27.8	63	15.6	29	7.2	66.4
20	The way people in general react to me would be	60	14.9	120	29.8	132	32.8	63	15.6	28	6.9	66.0
	Mean 62.27, Median 60.00, SD = 16.53											

	Domains	Mean	Median	SD
1.	**Physical**	67.91	58.46	19.24
2.	**Mental**	62.27	60.00	13.48
3.	**Quality Of life**	59.19	59.00	16.53

4.2 Inferential Statistics

4.2.1 Relation between participants governorate and selected variables

4.2.1.1 Governorate in comparison with participant level of awareness about DR

As shown in Table (4.16), there is a statistically significant differences across the five governorate and the level of awareness domain, with (F= 5.272, P= 0.001). North Gaza governorate study participants reported a significantly higher level of awareness about DR with mean 91.04, and Khanyounis governorate study participants reported a significant lower level of awareness with mean 79.74.

Post hoc Scheffe test has revealed that study participants from Khanyounis governorate had the lowest level of awareness about DR compared to other governorates with mean of 11.3 lower than North Gaza governorate participants, lower with mean of 8.6 than Gaza governorate, lower with mean of 7.9 than Dair Al Balah governorate, and lower with mean of 9.7 than Rafah governorate.

4.2.1.2 Governorate in comparison with client's provider interaction

As shown in Table (4.16), a one –way ANOVA test was conducted to examine whether there were statistically significant differences between patient's provider interaction domain and governorates. The result revealed a statistically significant of patient's provider interaction domain across the five governorates, with (F=3.781, P=0.005). Gaza governorate study participants reported a significantly higher patient's provider interaction with mean 79.19, while Rafah governorate study participants reported a significant lower patient's provider interaction with mean 74.07.

Post hoc Scheffe test has illustrated that Rafah governorate study participants had the lowest mean of the patient's provider interaction domain, with a mean of 5.12 less than Gaza governorate participants, and less with mean of 4.84 than North Gaza governorate participants. The differences were statistically significant.

4.2.1.3 Governorate in comparison with patient satisfaction

Concerning the relationship between level of patient's satisfaction with the provided services and governorate, as shown in Table (4.16), the results revealed a statistically

significant differences between patient satisfaction level domain and the five governorates, with (F=16.484, P=0.001). North Gaza governorate study participants reported a significantly higher satisfaction mean, with 77.89 compared to Khanyounis governorate study participants with mean 65.96.

Post hoc Scheffe test has revealed that Khanyounis governorate study participants had the lowest mean of satisfaction across the five governorates with 11.92 less than North Gaza governorate participants, less with mean of 7.3 than Dair Al Balah participants, less with mean of 6.18 than Rafah governorate and less with mean of 3.62 than Gaza governorate participants.

4.2.1.4 Governorate in comparison with availability of the services

As shown in Table (4.16), a one –way ANOVA test was conducted to examine whether there were statistically significant differences between availability of the services domain and governorates. The result illustrated statistically significant differences in the availability of services domain across the five governorates, with (F=12.722, P=0.001). Khanyounis governorate study participants reported a significantly higher availability of services with mean of 60.36, while Dair Al Balah governorate study participants reported a significant lower availability of services with mean 46.94%.

Post hoc Scheffe test has revealed that Khanyounis governorate study participants had the highest mean of availability of services with 13.4 higher than Dair Al Balah, higher with mean of 10.71 than Gaza governorate, higher with mean of 8.02 than Rafah governorate, and higher with mean of 7.73 than North Gaza governorate. The differences were statistically significant.

4.2.1.5 Governorate in comparison with Retinopathy Dependent Quality of Life

With regard to the differences in quality-of-life domain across the five governorates, as shown in Table (4.16), a one –way ANOVA test revealed a statistically significant differences in the quality-of-life domain across the five governorates, with (F=27.270, P=0.001). Khanyounis governorate study participants reported a significantly higher quality of life score with mean of 69.62, while North Gaza governorate study participants reported the lowest quality of life score, with mean of 51.98. The differences were statistically significant.

Post hoc Scheffe test has also showed that Khanyounis governorate study participants had the highest mean of retinopathy dependent quality of life with 17.6 higher than North Gaza governorate, with mean of 16.3 higher than Gaza governorate, with mean of 4.48 higher than Dair Al Balah governorate, and higher with mean of 1.66 than Rafah governorate. The differences are statistically significant.

Table (4.16): Differences between Dependent variables and Governorates

Dependent variables	Governorates	No.	Mean	SD	F	Sig.
Patient level of awareness about DR	North Gaza	59	91.04	13.50	5.272	0.001
	Gaza	181	88.40	17.35		
	Midzone	36	87.70	16.78		
	Khanyounis	98	79.74	21.11		
	Rafah	30	89.52	16.75		
	Total	**404**	**86.70**	**18.14**		
Client's provider interaction	North Gaza	59	78.92	10.83	3.781	0.005
	Gaza	181	79.19	10.94		
	Midzone	36	76.06	8.76		
	Khanyounis	98	74.82	10.27		
	Rafah	30	74.07	13.70		
	Total	**404**	**77.43**	**10.97**		
General Satisfaction	North Gaza	59	77.89	10.43	16.484	0.001
	Gaza	180	76.84	10.75		
	Midzone	36	73.21	8.61		
	Khanyounis	98	65.96	13.27		
	Rafah	30	72.15	14.60		
	Total	**403**	**73.68**	**12.38**		
Availability of services	North Gaza	59	52.63	12.61	12.722	0.001
	Gaza	180	49.64	12.57		
	Midzone	36	46.94	11.42		
	Khanyounis	98	60.36	14.58		
	Rafah	30	52.33	12.85		
	Total	**403**	**52.64**	**13.76**		
Retinopathy Dependent Quality of Life	North Gaza	59	51.98	15.07	27.270	0.001
	Gaza	181	53.27	14.65		
	Midzone	36	65.14	15.25		
	Khanyounis	98	69.62	13.81		
	Rafah	30	67.93	16.66		
	Total	**404**	**59.19**	**16.53**		

***Significant at 95% CI**

4.2.2 Relationship between study participants level of awareness about DR and selected variables

As shown in Table (4.17), by using Person correlation to examine whether there were statistically significant differences between patient level of awareness about DR and participants' age, years of schooling, income, years of suffering from DM and DR. The result illustrated statistically significant negative relationship between age of the study participants and patient level of awareness about DR with (R=-0.199, P=0.001). This finding is consistent with Alswania (2021) study, in which younger patients were more knowledgeable than older one (Alswania, 2021). However, there was no statistically significant relationship between patient level of awareness about DR and years of schooling with (R=0.004, P=0.941). Unlike Alswania (2021) study, who reported significant relationship between patient's level of awareness about DR and years of schooling, in which patients with a higher education level were more aware than less educated patients (Alswania, 2021).

With regard to years of suffering from DM and DR impact on patient level of awareness about DR, there was statistically significant negative relationship between patient level of awareness about DR and years of suffering from DM with (R=-0.115, P=0.021). But there were no statistically significant differences between years of being diagnosed with DR and patient level of awareness about DR.

As shown in Table (4.17), an independent samples t-test was conducted to examine whether there were statistically significant differences between patient level of awareness about DR and marital status, gender, type of DM, co-morbidities and having other DM complications. The test revealed statistically significant differences between patient level of awareness and marital status, with mean of (87.87) among married patients compared to mean of (81.71) among unmarried patients. The differences are statistically significant, with (T= 2.75, P value= 0.006).

While there weren't statistically significant differences between patient level of awareness about DR and both gender or type of diabetes with (T=-0.884, P=0.377), (T=-0.523, P=0.601) respectively. Moreover, the test revealed statistically significant difference between having other DM complications and patient level of awareness about DR with (T=-3.641, P= 0.000).

Additionally, one –way ANOVA test was conducted to examine whether there were statistically significant differences between patient level of awareness about DR and both working status and taking medication regularly. The test revealed only statistically significant difference between taking DM medicines regularly and Patient level of awareness about DR with (F= 11.348, P=0.000).

Table (4.17): Relationship between study participants level of awareness about DR and selected variables

Independent variables	**participants level of awareness about DR**					
Age	Person correlation (**r)**			**Sig.**		
	-0.199			0.001*		
Years of schooling	0.004			0.941		
Income	0.039			0.538		
Years of suffering from DM	-0.115			0.021*		
Years of being diagnosed with DR	-0.081			0.107		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**T**	**Sig.**
Marital status	Unmarried	82	81.71	22.92	2.757	0.006
	Married	318	87.87	16.58		
Gender	Male	220	85.97	18.21	-0.884	0.377
	Female	184	87.58	18.07		
Type of DM	Type I	48	85.42	17.56	-0.523	0.601
	Type II	356	86.88	18.24		
Having other chronic diseases	Yes	163	84.14	19.57	-2.352	0.019
	No	241	88.44	16.93		
Having other DM complication	Yes	64	79.24	23.04	-3.641	0.000
	No	340	88.11	16.74		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**F**	**Sig.**
Working status	Yes	71	86.12	18.70	0.254	0.776
	No	295	87.02	18.07		
	Retired	34	84.87	17.91		
	Total	400	86.68	18.14		
Taking DM medication regularly	Yes	364	87.91	17.25	11.348	0.000
	No	9	82.54	21.16		
	Sometimes	25	79.43	18.93		
	Often	5	45.71	21.19		
	Total	403	86.74	18.15		

***Significant at 95% CI**

4.2.3 Relationship between patient- provider interactions and selected variables

As shown in Table (4.18), person correlation test was conducted to examine whether there was statistically significant relationship between patient- provider interaction and participant's age, years of schooling, income, years of suffering from DM and DR. The test revealed statistically significant relationship only between patient- provider interaction and participant's income, with (R=0.158, P=0.011). Also, there was statistically significant negative relation between years of suffering from DM and patient's provider interaction with (R=-0.099, P=0.047).

Moreover, Table (4.18) shows that an independent samples t-test was conducted to examine study participants' marital status, gender, type of DM, co morbidities and having other DM complications influence on patient- provider interaction. The test revealed no statistically significant differences between patient- provider interaction domain and participants' marital status or gender. This finding is inconsistent with Yagar's study (2019), who reported being female is associated with better client- provider interactions.

While there was statistically significant difference between having other DM complications and patient's provider interaction, with (T=-4.337, P= 0.000).

Additionally, one –way ANOVA test was conducted to examine the influence of both working status and taking medication regularly on patient- provider interactions. The test revealed only statistically significant difference between client's provider interaction and taking DM medicines regularly with (F= 6.208, P=0.000).

Table (4.18): Relationship between patient- provider interactions and selected variables

Independent variables	**Patient- provider interactions**					
Age	Person correlation (**r)**			**Sig.**		
	-0.087			0.086		
Years of schooling	0.018			0.726		
Income	0.158			0.011*		
Years of suffering from DM	-0.099			0.047*		
Years of being diagnosed with DR	-0.068			0.180		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**T**	**Sig.**
Marital status	Unmarried	82	75.54	13.10	1.731	0.084
	Married	318	77.87	10.27		
Gender	Male	220	77.29	10.95	-0.280	0.780
	Female	184	77.60	11.01		
Type of DM	Type I	48	77.17	10.75	-0.177	0.859
	Type II	356	77.47	11.01		
Having other chronic diseases	Yes	163	76.79	11.50	-0.973	0.331
	No	241	77.87	10.59		
Having other DM complication	Yes	64	72.09	9.87	-4.337	0.000
	No	340	78.44	10.88		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**F**	**Sig.**
Working status	Yes	71	77.49	12.17	0.198	0.820
	No	295	77.47	10.70		
	Retired	34	76.24	10.91		
	Total	**400**	**77.37**	**10.97**		
Taking DM medication regularly	Yes	364	77.86	10.67	6.208	0.000
	No	9	81.11	12.13		
	Sometimes	25	72.88	11.62		
	Often	5	60.40	11.08		
	Total	**403**	**77.41**	**10.97**		

***Significant at 95% CI**

4.2.4 Relationship between availability of services and selected variables

As shown in Table (4.19), Person correlation test was conducted to examine study participants' age, years of schooling, income, years of suffering from DM and DR influence on availability of services. The test revealed statistically significant positive relationship between availability of services and years of schooling, with (R= 0.175, P=0.002), and with patient's income with (R=0.155, P= 0.020). In addition to, significant relation with both years of suffering from DM and years of being diagnosed with DR, with (R=0.132, P= 0.015, (R=0.113, P= 0.039), respectively.

Moreover, Table (4.19) shows that an independent samples t-test was conducted to examine study participants' marital status, gender, type of DM, co morbidities and having other DM complications influence on availability of services. The test revealed only statistically significant difference between availability of services and type of diabetes, with (T=2.394, P=0.02).

Additionally, one –way ANOVA test was conducted to examine the influence of both working status and taking medication regularly on availability of services. The test revealed only statistically significant difference between availability of services and working status with (F=5.609, P=0.004), in which retired participants reported higher availability of services with mean of 59.54 than both employed participants with mean of 58.8 and unemployed participants with mean of 54.54. From researcher point of view this because retired participants have both the time and the cost for the accessing the available services **(Annex 16).**

Table (4.19): Relationship between availability of services and selected variables

Independent variables	**Availability of services**					
Age	Person correlation (**r)**				**Sig.**	
	0.091				0.070	
Years of schooling	0.175				0.002*	
Income	0.155				0.020*	
Years of suffering from DM	0.132				0.015*	
Years of being diagnosed with DR	0.113				0.039*	
Independent variables	**Category**	**No.**	**Mean**	**SD**	**T**	**Sig.**
Marital status	Unmarried	82	52.07	13.12	0.401	0.689
	Married	317	52.76	14.00		
Gender	Male	184	56.20	11.01	0.891	0.374
	Female	155	55.14	10.70		
Type of DM	Type I	35	59.24	8.97	2.394	0.021
	Type II	304	55.31	11.00		
Having other chronic diseases	Yes	162	51.88	14.32	-0.909	0.364
	No	241	53.15	13.38		
Having other DM complication	Yes	134	55.92	11.47	0.284	0.777
	No	205	55.58	10.48		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**F**	**Sig.**
Working status	Yes	57	58.83	11.49	5.609	0.004
	No	248	54.54	10.62		
	Retired	33	59.19	10.24		
	Total	338	55.72	10.88		
Taking DM medication regularly	Yes	363	55.66	13.95	2.093	0.101
	No	9	63.81	15.21		
	Sometimes	25	52.55	8.54		
	Often	5	53.33	6.71		
	Total	402	55.66	13.71		

***Significant at 95% CI**

4.2.5 Relationship between study participants level of satisfaction with the provided services and selected variables

As shown in Table (4.20), by using Person correlation to examine study participants' age, years of schooling, income, years of suffering from DM and DR influence on patient level of satisfaction with the provided services. The test revealed statistically significant negative relationship between age of the study participants and the patient satisfaction with the services provided with (R=-.197, P=0.001). This result is consistent with the findings of Ju & Kim (2021) study, who reported significant relationship between age and general satisfaction, being older associated with lower satisfaction as older people need more services than younger clients (Ju & Kim, 2021).

Also, there were statistically significant negative relations between patient satisfaction and both years of suffering from DM and DR with (R=-0.240, P=0.001, R=-0.214, P=0.001), respectively.

As shown in Table (4.20), an independent samples t-test was conducted to examine study participants' marital status, gender, type of DM, co morbidities and having other DM complications influence on patient level of satisfaction with the provided services. The test revealed marginal statistically significant negative difference between gender of the study participants and general satisfaction with the provided services with (T=-1.96, P-value=0.05).

While there wasn't statistically significant difference between patient satisfaction and marital status with (T=- 0.278, P=0.781). However, this result was inconsistent with De Oliveira and Colleagues (2020) study, who reported significant difference between marital status and patient's satisfaction level, in which married patients were more satisfied than single or divorced patients (De Oliveira et al., 2020).

Moreover, there was statistically significant negative difference between patient satisfaction and having other DM complication (T=-5.971, P=0.000). This result was inconsistent with Boels and Colleagues (2017) study, who reported higher treatment satisfaction in patients with DM complication, as patients with DM complications took healthcare providers attention which can lead to higher treatment satisfaction (Boels et al., 2017).

Additionally, one –way ANOVA test was conducted to examine the influence of study participants working status and taking DM medication regularly on participants satisfaction toward the provided services. The test revealed statistically significant differences between participants satisfaction and both working status and taking DM medicines regularly, with (F= 3.285, P=0.038; F=3.628, P=0.013), respectively.

This finding is consistent with Mao and Colleagues (2019) study, in which he reported that diabetes and its complication brings financial burden on patients, especially if they were unemployed and without health insurance, which in turns affects patient accessing to available health services, resulting in negative impact on patient satisfaction and quality of life (Mao et al., 2019).

Table (4.20): Relationship between study participants level of satisfaction with the provided services and selected variables

Independent variables	**participants level of satisfaction with the provided services**					
Age	Person correlation (**r)**			**Sig.**		
	-0.197			0.001*		
Years of schooling	-0.083			0.107		
Income	0.066			0.290		
Years of suffering from DM	-0.240			0.001*		
Years of being diagnosed with DR	-0.214			0.001*		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**T**	**Sig.**
Marital status	Unmarried	82	73.28	11.45	0.278	0.781
	Married	317	73.70	12.57		
Gender	Male	220	72.58	12.85	-1.962	0.050
	Female	183	75.00	11.69		
Type of DM	Type I	47	73.43	11.35	-0.146	0.884
	Type II	356	73.71	12.52		
Having other chronic diseases	Yes	162	72.80	11.71	-1.166	0.244
	No	241	74.26	12.80		
Having other DM complication	Yes	63	65.47	10.83	-5.971	0.000
	No	340	75.20	12.06		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**F**	**Sig.**
Working status	Yes	71	73.15	13.28	3.285	0.038
	No	295	74.40	11.57		
	Retired	34	68.76	15.97		
	Total	400	73.69	12.38		
Taking DM medication regularly	Yes	363	74.33	12.22	3.628	0.013
	No	9	72.35	16.37		
	Sometimes	25	66.40	11.15		
	Often	5	68.44	10.35		
	Total	402	73.72	12.36		

***Significant at 95% CI.**

4.2.6 Relationship between patient retinopathy dependent quality of life and selected variables

As shown in Table (4.21), by using Person correlation to examine study participants' age, years of schooling, income, years of suffering from DM and DR influence on patient retinopathy dependent quality of life. The test revealed only statistically positive relationship between retinopathy dependent quality of life and participant's years of schooling with (R=0.190, P=0.002). This finding is in line with Abu Alhommos and Colleagues (2022) study, who reported that educated patient has higher quality of life compared to less educated clients (Abu Alhommos et al., 2022).

But there wasn't statistically significant relationship between retinopathy dependent quality of life and participant's years of suffering from DR with (R=0.046, P=0.352). Unlike Pereira and Colleagues (2017) study, who reported that patient with DR had significantly lower quality of life than those without DR with significant impacts on patients' general health, general vision and mental health, and quality of life decreased as the duration of retinopathy increased (Pereira et al., 2017).

Moreover, Table (4.21) shows that an independent samples t-test was conducted to examine study participants' marital status, gender, type of DM, co morbidities and having other DM complications influence on patient retinopathy dependent quality of life. The test revealed statistically significant differences between patient retinopathy dependent quality of life and marital status with mean of (60.31) among married participants compared to mean of (55.06) among unmarried participants, the difference was statistically significant with (T= 2.574, P= 0.01). This finding is consistent with Abu Alhommos and Colleagues (2022) study, who reported being married is associated with higher quality of life (Abu Alhommos et al., 2022).

However, there wasn't statistically significant differences between patient retinopathy dependent quality of life and gender (T=0.080, P=0.109). Unlike Alshayban and Colleagues (2020) study, who reported statistically signification differences between gender and quality of life, in which being female is associated with lower quality of life (Alshayban et al., 2020).

In addition to, statistically significant difference between retinopathy dependent quality of life and both having other chronic diseases and having other DM complication, with (T=-3.427, P= 0.001; T=3.515, P=0.001), respectively. This result is consistent with Ge and Colleagues (2019) study, who reported that having one chronic disease decrease quality of life, and quality of life is decreased more in casa of having multi- morbidity (Ge et al., 2019).

This result is inconsistent with Pham and Colleagues' study, who found that having DM complications significantly decrease patient's quality of life in all aspects, mental, emotional and social, compared to those without DM complications (Pham et al., 2020).

Additionally, Table (4.21) shows that one –way ANOVA test was conducted to examine working status and taking medication regularly influence on participants' retinopathy dependent quality of life. The test revealed statistically significant difference only between retinopathy dependent quality of life and participants working status with mean of 67.41 among employed participants compared to mean of 57.16 and 60.56 among both unemployed and retired participants respectively. The difference was statistically significant, with (F=11.874, P= 0.000).

Table (4.21): Relationship between patient retinopathy dependent quality of life and selected variables

Independent variables	**Patient retinopathy dependent quality of life**					
Age	Person correlation (**r)**			**Sig.**		
	-0.080			0.109		
Years of schooling	0.190			0.002*		
Income	0.068			0.269		
Years of suffering from DM	-0.071			0.154		
Years of being diagnosed with DR	0.046			0.352		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**T**	**Sig.**
Marital status	Unmarried	82	55.06	18.28	2.574	0.010
	Married	318	60.31	15.97		
Gender	Male	220	60..3	17.00	1.109	0.268
	Female	184	58.20	15.95		
Type of DM	Type I	48	55.06	11.75	-1.849	0.065
	Type II	356	59.75	17.01		
Having other chronic diseases	Yes	163	55.81	15.07	-3.427	0.001
	No	241	61.48	17.11		
Having other DM complication	Yes	64	65.77	13.93	3.515	0.001
	No	340	57.96	16.71		
Independent variables	**Category**	**No.**	**Mean**	**SD**	**F**	**Sig.**
Working status	Yes	71	67.41	16.47	11.874	0.000
	No	295	57.16	15.78		
	Retired	34	60.56	16.80		
	Total	400	59.27	16.42		
Taking DM medication regularly	Yes	364	58.95	16.79	0.524	0.666
	No	9	56.78	13.56		
	Sometimes	25	62.76	15.29		
	Often	5	62.00	7.97		
	Total	403	59.17	16.55		

***Significant at 95% CI.**

4.2.7 Association between quality of life and section domains

As shown in Table (4.22), Person correlation test was conducted to examine whether there were statistically significant relations between quality of life and section domains. The test revealed statistically significant relation between physical and mental quality of life domain with (R=.746, P=.000), statistically significant relation between physical health-related quality of life and total quality of life with (R=.979, P=.000), and negative

statistically significant relation between physical health related quality of life and patient level of awareness about DR with (R=-.371 P=.000).

Moreover, there is negative statistically significant relation between physical health related quality of life and patient satisfaction with (R=-.352, P=.000), and negative statistically significant relation between physical health related quality of life and patient knowledge with (R=-0.132, P=.008). Unlike Abu Alhommos and Colleagues (2022) study, who reported that patient knowledge is positively associated with quality of life (Abu Alhommos et al., 2022).

Regarding mental health related quality of life, there is statistically significant relation between mental health quality of life and physical quality of life with (R=.746, P=.000), and negative statistically significant relation between mental health related quality of life and both patient level of awareness about DR and patient satisfaction with (R=-.232, P=.000), (R=-.209, P=.000) respectively.

With regard to the total quality of life, there are negative statistically significant relations between total quality of life and patient satisfaction, patient level of awareness and knowledge about DR with P value of (R=-.359, P=0.00; R=-.326, P=0.000;(R=-.140, P=0.005) respectively. This is in contrast with Khdour and Colleagues (2020) study, who reported positive relation between satisfaction and quality of life, while other studies showed low connection between satisfaction and quality of life (Khdour et al., 2020).

In addition to, having statistically significant relations between patient level of awareness about DR and both patient satisfaction and knowledge with (R=.585, P=0.000; R=.334, P=0.000), respectively.

Moreover, there is negative statistically significant relation between satisfaction and availability of services with (R=-.163, P=.003), and statistically significant relation between satisfaction and knowledge with (R=.385, P=.000). Finally, there is negative statistically significant relation between knowledge and availability of services with (R=-.139, P=0.010).

Table (4.22): Association between quality of life and section domains

Items		Physical	Mental	QOL	Patient level of awareness about DR	Satisfaction	Availability of Services	Knowledge
Physical	R		.746	.979	-.371	-.352	.005	-.132
	Sig.		.000	.000	.000	.000	.930	.008
Mental	R	.746		.858	-.232	-.209	.056	-.094
	Sig.	.000		.000	.000	.000	.300	.060
QOL	R	.979	.858		-.359	-.326	.016	-.140
	Sig.	.000	.000		.000	.000	.765	.005
Patient level of awareness about DR	R	-.371	-.232	-.359		.585	.094	.334
	Sig.	.000	.000	.000		.000	.083	.000
Satisfaction	R	-.352	-.209	-.326	.585		-.163	.385
	Sig.	.000	.000	.000	.000		.003	.000
Availability of services	R	.005	.056	.016	.094	-.163		-.139
	Sig.	.930	.300	.765	.083	.003		.010
Knowledge	R	-.132	-.094	-.140	.334	.385	-.139	
	Sig.	.008	.060	.005	.000	.000	.010	

Chapter Five

Conclusion and Recommendation

5.1 Conclusion

DR is the leading cause of blindness and visual impairment in working-aged adults and represents major health problem that should be effectively managed. The DR health services in GS were evaluated by assessing the main components and outcomes of DR services by using mixed method approach. Quantitative method by developing structured questionnaire to collect data about patient's perception of the provided DR services, patient awareness and retinopathy dependent quality of life from 404 participants. Qualitative method by using focus group discussions to collect data from DR patients and in-depth interviews with key eye services providers to assess their perception about provided services strength, weakness, accessibility barriers and take their recommendations for improvement.

The quantitative findings of this study were collected from 54.5% male and 45.5% female, with mean age of 59.18 years old, who received eye services from the following hospitals: 59.9% from NOH, 35.9% from SJEH, 30.0% from EGH**.** About 74.5% of study participants were married at time of data collection, with 12.19% mean years of schooling. Moreover, 73.8% of the study participants were unemployed compared to 17.8% were employed and 8.5% of them were retired. Regarding monthly income of the study participants, the median was 1000 ILS, only 23.6% of the study participants had monthly income above the poverty line compared to 76.4% of the study participants had monthly income under the poverty line.

About 88.1% of the study participants suffered from DM type 2 compared to 11.9% of them suffered from DM type 1, the mean years of suffering from DM was 13.07 years. More than half of the study participants had another family member with DM, mainly mother with 49% and father with 35.6%. With regard to participants' s treatment modalities to control blood glucose level, about 52.7% of study participants used insulin and 49.5% of the study participants used oral hypoglycemic medications, while only 27.2% of the study participants followed diet plan and 12.1% followed lifestyle modality. A total of 56.1% of the study participants described their weight as being overweight or obese. 40.3% of participants had another co-morbidity, mainly hypertension. 15.3% of

study participants suffered from another DM complications, mainly from peripheral neuropathy. The majority of participants (90%) took their medication regularly.

Regarding DR, the mean years of suffering from DR was 4.23 years. About 66.3% of participants reported that their doctors advised them to consult ophthalmologist, 88.3% of them reported that their doctor advised them to do annual ophthalmic check-up. About 70.4% of participants had easy access to DR services, and the main barrier for missing their appointment was the lack of family support (33.7%), followed by the cost barrier either transportation cost or service cost (24.3%, 23.3%) respectively. However, 26.5% of the study participants had no barrier to access the eye care services neither physical barrier nor financial barrier, fearing from losing vision force them to overcome any barrier and regularly follow up their eyes. 55% of the study participants agree with the affordability of the DR services to most of the people across the GS. Almost half of the participants (51.6%) reported that services met their expectations.

Generally speaking, participants have good level of awareness about DR, with mean of 86.8%. The main areas of knowledge deficit among participants were participants' knowledge about the negative impact of diabetes on their vision, the high risk of vision loss when had uncontrolled diabetes, and participants' knowledge about relation between diabetes or HGA1c level on their DR progression. In addition to, participants' knowledge about positive impact of lifestyle modifications on controlling participants their blood sugar level, and participant' knowledge about the importance of conducting eye checkup when they had controlled blood sugar level. However, it's noteworthy that the majority of focus groups participants reported that they hadn't been informed about DM complications on their eyes, and they hadn't given precautions to protect their eyes, until they had been diagnosed with DR. Moreover, patient level of awareness was significantly associated with the age, in which younger patients were more knowledgeable than older one.

About 84.4% of the study participants reported that screening test is always available at the hospitals where the data was collected.

The mean of waiting time was 57.02 minutes, it worthy to mention that waiting time wasn't considered as problem for the majority of the study participants. Only 29% of the study participants reported that health insurance covered all the cost associated with DR treatment. However, many focus group participants mentioned that, inadequate health insurance coverage was one of the fundamental barriers to access health services,

especially because of the absence of specialized services at public hospitals, forcing patients to receive it from private sectors at unaffordable cost to people at low socioeconomic status.

Regarding the availability of protocols or updated clinical guidelines for management of DR, physicians at governmental hospital reported lack of protocols and updated clinical guidelines, and their disease management depends on their perceptions and experiences. However, doctors at SJEH mentioned that they have clinical guidelines and protocols they rely on it, in addition to the international diplomas and courses that they took to provide specialized eye services, resulting in reduction of number of referrals. From healthcare provider point of view, accessing tertiary care is one of the human rights. However, the weakness of the referral system is one of the fundamental barriers to adequate quality of care, which patient faced in case of absence of necessary health service at public.

With regard to barriers to access from healthcare providers perspective, on one hand, healthcare provider at managerial position reported that the lack of adequate infrastructures, poor health information system and limited financial resources as well as fragmentation of health system. In addition to the political and socioeconomic situation in the GS directly and indirectly impacts the healthcare system, the political division between Gaza and West Bank authorities and lack of unified decision and political commitment between the two authorities affects the quality of healthcare system and delay the improvement process. One the other hand, physicians at governmental hospitals reported many personal barriers that negatively impact quality of the care, the majority of the stuff were burned out, they loss the passion in deliver services with acceptable quality, due to many reasons such as lack of salaries, incentives and capacity building, along with weak monitoring and supervision of staff performances.

Generally speaking, participants had good patient- provider interactions, with mean of 77.4%. However, patient complained mainly from their limited involvement in in the decision-making process, inability to understand their physician langue, and limited explanation of treatment advantage and disadvantage from their physician.

Regarding patient satisfaction to the provided services the mean of satisfaction was 75.56%. Unfortunately, many of the focus groups participants were not satisfied with quality of the given treatment, and they said that the given treatment worsens their situation instead of improving it. And they doubt the quality of the services, however they

hadn’t any other choices. Moreover, patient satisfaction was significantly associated with age, gender and working status.

Regarding patient quality of life, the mean of retinopathy dependent quality of life was 67.91%, and it was significantly associated with marital status, years of schooling and working status.

To sum up, DR management process is multifactorial therapy targeted to lifestyle modification and tight glycemic control to reduce the risk of DR, this therapy includes primary (preventive) strategies such as glycemic, lipid, and blood pressure control.

Moreover, the study emphasizes on the important role of the primary care provider in preserving the vision of diabetic patients by providing education, recommendation and sometimes referring patient for DR screening. As the primary healthcare providers develop more relationships and can have great influence on DM patient adherence to management plan.

5.2 Recommendations

General recommendation

1. It is recommended that the MoH develops and implements strategic ophthalmic interventions at the PHC clinics level, mainly conducting DR early screening to all DM clients, per the recommended international guidelines.
2. As the MoH does not have guidelines or protocols to treat DR, adopting SJEH guidelines in managing DR could be an option, then MoH could lead the process of developing national guidelines.
3. Improve and widen the available subspecialties by training eye healthcare providers on highly needed subspecialties. In addition to training health providers on certain needed areas like communication and selfcare management are also recommended.
4. Strengthen the referral mechanism between PCHS and hospitals, across all different providers.
5. Enhance patient adherence to regular DR screening is very important because most patients who develop DR have no symptoms until very late stages, and by then it is often too late for effective treatment. The health providers need to enhance the DR

screening through developing appointment systems and follow up systems. It is also important to increase patients' awareness about DR and its complications through providing them with educational program that involves developing user-friendly educational material.

6. Increase public awareness about DR and its complications, by applying widespread educational program and continuous assessment of awareness are desirable. In addition to collaborative efforts between governmental and private sector to raise public awareness by providing community and health initiatives.
7. Enhance care coordination and communications between primary and eye healthcare providers, in order to decrease relay on patient self-reporting, and also to improve referral mechanism by reducing load on patient in following traditional way of referral and enable faster appointment.

5.3 Recommendation for further research

1. Conduct research to determine the risk factors associated with the development of DR.
2. Conduct wider qualitative studies with healthcare providers and DR patients to assess their perspectives about DR management in the Gaza Strip.
3. Conduct research studies to assess the impact of patient provider interactions on treatment outcomes.
4. Conduct a national study to assess the current prevalence of DR in the GS and West Bank.
5. Conduct research study to assess the cost effectiveness of DR screening in the GS.
6. Conduct research study to assess the effective role controlled HbA1c level on delaying and prevent DM complications

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Annexes

Annex (1): Palestine map

Annex (2): Gaza Strip map

Annex (3): Helsinki Committee research 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: 15\02\2021 **Number:** PHRC/HC/866/21

Name: Marian Jameel Saba الاسم:

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:

Evaluation of Diabetic Retinopathy in the Gaza Strip

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/866/21 in its meeting on 15\02\2021 و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Member**

Dr. Yahia Abed

Chairman

23 2 2021

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

Annex (4): MoH Approval

State of Palestine
Ministry of health

دولة فلسطين
وزارة الصحة

السيد : رامي عيد العبادله المحترم

التاريخ:22/08/2021
رقم المراسلة 751852

مدير عام بالوزارة /الإدارة العامة لتنمية القوى البشرية/وزارة الصحة

السلام عليكم ,,,

الموضوع/ تسهيل مهمة الباحثة/ د. ماريان سابا

التفاصيل //
بخصوص الموضوع أعلاه، يرجي تسهيل مهمة الباحثة/ د. **ماريان جميل سابا**
الملتحقة ببرنامج ماجستير سياسات وادارة صحية – كلية الصحة العامة ـ جامعة القدس أبوديس بغزة في إجراء بحث بعنوان:

"Evaluation of Diabetic Retinopathy in the Gaza Strip"

حيث الباحثة بحاجة للاطلاع على الملف الطبي وتعبئة استبانة من عدد من مرضى السكر الذين يعانون من اعتلال الشبكية والمترددين على مستشفى العيون ومستشفى غزه الأوربي ومستشفى سان جون.
نأمل توجيهاتكم لذوي الاختصاص بضرورة الحصول على الموافقة المستنيرة من المرضى الذين هم على استعداد للمشاركة في الدراسة ومن ثم تمكين الباحثة من التواصل معهم، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي، ودون تحمل الوزارة أي أعباء أو مسئولية.
وتفضلوا بقبول التحية والتقدير،

1- البحث حاصل على موافقة لجنة اخلاقيات البحث الصحي (لجنة هلسنكي)
2- تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 6 أشهر من تاريخه.

محمد ابراهيم السرساوي
مدير دائرة/الإدارة العامة لتنمية القوى البشرية

التحويلات

- محمد ابراهيم محمد السرساوي(مدير دائرة) ← رامي عيد سليمان العبادله(مدير عام بالوزارة)
- رامي عيد سليمان العبادله(مدير عام بالوزارة) ← عبد السلام محمد عيد صباح(مدير عام بالوزارة)
- عبد السلام محمد عيد صباح(مدير عام بالوزارة) ← يوسف فوزي اسماعيل العقاد(مدير مستشفى)
- يوسف فوزي اسماعيل العقاد(مدير مستشفى) ← اشرف خليل محمد ابو الروس(مدير اداري)
- يوسف فوزي اسماعيل العقاد(مدير مستشفى) ← اتحاد شكري شاكر شبير(طبيب رئيس قسم)
- يوسف فوزي اسماعيل العقاد(مدير مستشفى) ← عطا اسماعيل خليل الجعبري(مدير دائرة التمريض)

إجراءاتكم
بالخصوص(22/08/2021)

Gaza Tel. (+970) 8-2846949 Fax. (+970) 8-2826295

غزة تلفون. (+970) 8-2846949 فاكس (+970) 8-2826295

بالخصوص(22/08/2021)

إجراءاتكم
بالخصوص(22/08/2021)

Annex (5): St. John Hospital letter for research approval

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ:2021/8/28

حضرة السيد/ وليد شقورة المحترم
مدير مستشفى سان جون
تحية طيبة وبعد،،،

الموضوع: مساعدة الطالبة ماريان جميل طرزي

نشكر لكم دعمكم الدائم لمسيرة العلم والتعليم وخصوصاً دعم كلية الصحة العامة وطلابها، ونود أعلامكم بأن الطالبة المذكورة أعلاه تقوم بعمل بحث كمتطلب للحصول على درجة الماجستير في السياسيات والإدارة الصحية/الجودة وسلامة المريض بعنوان:

"*Evaluation of Diabtic Retinopathy in the Gaza Strip*"

وعليه نرجو من سيادتكم التكرم بالموافقة على تسهيل مهمة الطالبة في إنجاز هذا البحث حيث أن الفئه المستهدفة هم مرضى السكري النوع الاول والثاني والذين يعانون من اعتلال الشبكية والمراجعين في مستشفى سان جون التابع لإدارتكم الموقرة .

و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حمد
منسق عام برامج الصحة العامة
فرع غزة

نسخة:
- الملف

Jerusalem Branch/Telefax 02-2799234
Gaza Branch/Telefax 08-2644220 -2644210
P.O. box 51000 Jerusalem

فرع القدس / تلفاكس 02-2799234
فرع غزة / تلفاكس 08-264420-2644210
ص.ب. 51000 القدس

Annex (6): Time framework

Activity	Duration	10	1	12	1	2	3	4	5	6	7	8	9	10
Proposal	3 months													
Proposal defense and approval	1 month													
Expert committee check for validity of instruments	1 month													
Pilot Study	2 weeks													
Modifications	2 weeks													
Data Collection	1 months													
Data Entry	1 months													
Data Analysis	1 months													
Research writing	2 months													
Final Report	1 month													

Annex (7): Estimated Budget

Item	Unit	Expected USD	Comments
Study tools	MP3 recorder	100	
Training workshop	For data collectors	100	
Photocopy papers		300	
SIM card & balance	To call study sample	300	
Data Collectors	150 x 5 USD for questionnaires 4 KII x 4note taker x 50 USD	950	
Data entry & Analysis		1000	
Dissemination of results	Refreshments	500	
Copy of final report	10copy x 10 USD	100	
Transportation	3 months	500	
Other Exp.		500	
Total budget		4350	Expected to be more

Annex (8): Sample Size Calculation

Sample Size Calculator

Find Out the Sample Size

This calculator computes the minimum number of necessary samples to meet the desired statistical constraints.

Result

Sample size: **351**

This means 351 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±5% of the measured/surveyed value.

Confidence Level:	95%	
Margin of Error:	5	
Population Proportion:	50	Use 50% if not sure
Population Size:	3937	Leave blank if unlimited population size.

Annex (9): The questionnaire and patient consent form in Arabic and English version

إقرار بالموافقة على المشاركة في بحث علمي

جامعه القدس أبوديس

كلية الصحة العامة - جامعة القدس أبوديس

عنوان البحث	تقييم اعتلال الشبكية السكري في قطاع غزة
الباحث الرئيسي	ماريان جميل سليمان سابا
اسم المشرف على البحث	د. ختام أبو حمد
اسم المشارك (عينة البحث أو وكيله)	
نوع وثيقة إثبات الشخصية / رقمها ومكان صدورها (إرفاق صورة عن الوثيقة فى حالة الأبحاث السريرية)	□ بطاقة أحوال شخصية □ جواز سفر □ أخرى □ الرقم □ مكان الصدور □ **إرفاق صورة عن الوثيقة في حالة الأبحاث السريرية**
العنوان	
رقم الهاتف	

سيشرح لك الباحث الرئيسي أو أحد أعضاء فريق البحث محتويات هذا البحث وتأثيره عليك. وفى هذا الإقرار سيتم إعلامك بإجراءات البحث، والمخاطر والفوائد من المشاركة، وكيفية الحفاظ على سرية المعلومات. وعليه نرجو منك اخذ الوقت الكافي في طرح الأسئلة لكي تتخذ قرارك إذا كنت ستشارك في البحث أم لا. وهذه الموافقة تسمى الموافقة المستنيرة، إذا قررت المشاركة في البحث، سيطلب منك التوقيع على هذا الإقرار وستعطى نسخة لسجلاتك.

على الباحث الرئيسي أو أحد أعضاء فريق البحث توضيح النقاط التالية لعينة البحث:

1-الهدف من إجراء البحث: تهدف هذه الدراسة إلى تقييم إدارة اعتلال الشبكية السكري الحالي بين مرضى السكري من أجل اقتراح توصية ليس فقط لتقليل مضاعفاته، والتي قد تؤدي إلى العمى الذي لا يمكن علاجه، ولكن أيضًا لتقليل تكلفة الخدمات المقدمة. بالإضافة إلى أن نتائج الدراسة يمكن ان تساهم في تحسين جودة الخدمات المقدمة والذي بدوره يساعد في تحسين جودة الحياة للمرضى.
2- **عدد المشاركين في البحث:** 400مريض
4-موقع اجراء البحث: مستشفى سان جون

5-مدة مشاركة العينة في البحث: 20دقيقة
6-قدرة عينة البحث على إنهاء المشاركة في البحث: يستطيع الفرد من عينة البحث أن يتوقف عن المشاركة في البحث في أي وقت. فقط عليه أن يخبر الباحث الرئيسي أو أحد أعضاء فريق البحث ليوضح له كيفية إنهاء مشاركته بأمان. ولا يجوز أن يتم الضغط عليه لإجباره بالاستمرار في البحث. فهو أمر مخالف لأساسيات أخلاق البحث.
12- الحفاظ علي سرية المعلومات الطبية الخاصة بعينة البحث. يلتزم القائمون على البحث بأن المعلومات الشخصية في سجلك تحظى بالسرية التامة. يستثنى من ذلك الحالات التي يقتضي فيها الأمر الإفصاح عن معلومات البحث بموجب القانون. لن يتم الإفصاح عن اسمك أو معلوماتك الشخصية إذا تم نشر أو عرض نتائج لبحث.
13- حقوق عينة البحث في حال الموافقة على المشاركة في هذا البحث: قرار المشاركة في البحث من اختيارك. فلك حرية اختيار المشاركة في البحث أو لا. كما يمكنك إنهاء المشاركة في أي في حال الموافقة على المشاركة في البحث عليك وقت. ومهما كان قرارك، لن يكون هناك أي عقوبة مترتبة عليك. تعبئة نموذج الموافقة على المشاركة في البحث

اسم وتوقيع المريض: **التاريخ:**

اسم وتوقيع الباحث الرئيسي: **التاريخ:**

تقييم اعتلال الشبكية السكري في قطاع غزة

انا ماريان جميل سليمان سابا طالبة في كلية الصحة العامة بجامعة القدس. يتم تنفيذ هذه الدراسة كجزء من متطلبات الحصول على درجة الماجستير في السياسات والإدارة الصحية من جامعة القدس، كلية الصحة العامة - فلسطين ولقد تم اختيارك لتكون مشاركًا في هذه الدراسة البحثية بعنوان "تقييم اعتلال الشبكية السكري في قطاع غزة". ولقد تم اختيارك للمشاركة في هذه الدراسة لأنك استوفيت معايير الاختيار للمشاركة.

تهدف هذه الدراسة إلى تقييم حالة الخدمات المقدمة لمرضى اعتلال الشبكية السكري في قطاع غزة. ستمنحك المشاركة في الدراسة فرصة لإخبارنا عن حالة خدمات اعتلال الشبكية السكري المقدمة لك في قطاع غزة ووجهة نظرك حيال ذلك. قد تساعد نتائج واستنتاجات هذه الدراسة في تحسين الخدمات المقدمة لمرضى اعتلال الشبكية السكري في قطاع غزة. أقدر مشاركتك في هذه الدراسة البحثية وتحتاج إلى الإجابة على أسئلة القائم بإجراء المقابلة التي لا تستغرق أكثر من 20 دقيقة.

سيتم استخدام النتائج فقط لأغراض البحث وسيتم تقديمها على المستوى الإجمالي، دون الكشف عن أي بيانات تعريف. لن يتم مشاركة البيانات مع أي شخص، سيتمكن الباحث فقط من الوصول إلى البيانات. سيتم توفير سرية البيانات والحفاظ عليها. على الرغم من أنني أرحب بمشاركتك، إلا أن المشاركة اختيارية. لديك الحق في إيقاف أو إنهاء ملء الاستبيان في أي وقت، كما يحق لك تخطي أي سؤال.

شكرا جزيلا على استعدادك للمشاركة

اليوم ..... التاريخ ..... **..... HbA1c** **رقم مسلسل .....**	
الجزء الأول: عوامل المريض	
القسم الأول: المتغيرات الاجتماعية والديموغرافية والاقتصادية لمريض اعتلال الشبكية السكري:	
1	المكان (حسب المحافظة): 1- شمال غزة 2- غزة 3- دير البلح 4- خانيونس 5- رفح
2	في أي مستشفى تتلقى العلاج؟ (خيارات متعددة) 1- مستشفى سان جون 2-مستشفى النصر للعيون 3-مستشفى الاوروبي 4-مستشفى خاص
3	العمر بالسنين ..... سنة
4	جنس: 1- ذكر 2- انثى
5	الحالة الاجتماعية: 1- أعزب 2-متزوج 3-ارملة 4-مطلقة 5-منفصلة
6	سنوات الدراسة.....سنه
7	حالة العمل الحالية؟ 1- أعمل 2- لا أعمل 3-متقاعد إذا كانت الإجابة نعم، ما هو عملك الحالي؟ .....
8	ما هو الدخل الشهري لأسرتك (من جميع المصادر)؟ ---------- شيكل
9	ما سبب زيارتك اليوم؟ 1- زيارة متابعة اعتيادية بموعد مسبق 2- زيارة متابعة من دون موعد مسبق 3- لإجراء ليزر 4- لإجراء تحاليل طبية 5-لاجراء جراحة 6- لإجراء فحص تشخيصي 7-اسباب اخرى، حدد.....
القسم 2: معلومات طبية عن مريض اعتلال الشبكية السكري	
10	ما هو نوع مرض السكر لديك؟ 1- النوع الاول 2-النوع الثاني
11	منذ كم سنة تعاني من سكر؟ ..... سنة
12	هل لديك فرد آخر من العائلة مصاب بمرض السكر؟ 1- نعم 2- لا

	إذا كانت الاجابة نعم فمن هو؟ أم، أب، أخت، أخ، زوج، آخرين حدد.....
13	منذ متى تم تشخيصك بـالاعتلال الشبكية السكري؟ .....
14	ما هي طريقة علاجك؟ (إجابات متعددة) 1- اتباع نظام غذائي 2- أدوية تعطى عن طريق الفم 3-انسولين 4- اتباع اسلوب حياة صحي 5- لا شيء
15	هل تصف نفسك ب؟ 1- وزن زائد 2- نقص وزن 3- وزن طبيعي 4-بدين
16	هل لديك أمراض مزمنة أخرى مثل ارتفاع في ضغط الدم، ارتفاع في نسبة الدهون، انسداد رئوي مزمن؟ 1- نعم 2-لا إذا كانت الاجابة نعم، فما هو: 1- ارتفاع في ضغط الدم 2- انسداد رئوي مزمن 3-قلب 4- اخرى، حدد..... إذا كان لديك ارتفاع في ضغط الدم، هل هو منتظم؟ 1-نعم، معظم الأوقات 2-نعم، ولكن ليس في كل وقت 3- مطلقا
17	منذ كام سنة تعاني من ارتفاع في ضغط الدم..... سنة
18	هل لديك مضاعفات اخرى لمرض السكر؟ 1- نعم 2- لا إذا كانت الاجابة نعم، حدد.....
19	هل تتناول أدوية السكر بشكل منتظم؟ 1- نعم 2- لا 3- احيانا 4- غالبا
20	هل ينصحك طبيبك باستشارة طبيب العيون لمتابعة مضاعفات مرض السكري المتعلقة بالعين؟ 1- نعم 2- لا 3-لا أعلم
21	هل ينصحك طبيب العيون الخاص بك بإجراء فحص عين على الأقل مرة كل عام؟ 1- نعم 2- لا 3-لا أعلم
22	متى كانت آخر مرة أجريت فيها فحص لاعتلال الشبكية السكري؟ 1- .....شهر 2- اطلاقا
23	هل تلقيت تغذية راجعة عن فحص اعتلال الشبكية السكري؟ 1- نعم 2- لا إذا كانت الاجابة نعم، هل أثر ذلك على خطة ادارة مرض السكر لديك؟ 1- نعم 2- لا 3- لا أعلم

24	هل خضعت لجراحة الشبكية لمرض السكري العام الماضي؟ 1- نعم 2- لا 3- لا أعلم إذا كانت الاجابة نعم، أين؟ .....
25	هل خضعت لعلاج اعتلال الشبكية السكري بتقنية الليزك في العام الماضي؟ 1- نعم 2- لا 3- لا أعلم إذا كانت الاجابة نعم، أين؟ .....
26	هل تجري التحاليل المخبرية السنوية بانتظام؟ 1- نعم 2- لا إذا كانت الاجابة نعم، متى آخر مرة أجريت فيها تحاليل مخبرية؟ قبل.....شهر هل تلقيت تغذية راجعة حول نتائج التحليل المخبري السنوي؟ 1- نعم 2- لا 3- لا أعلم ماذا قال طبيبك عن نتيجة مخزون السكر لديك؟ 1- منتظم 2- غير منتظم 3- لا أعلم هل أثرت النتيجة على خطة إدارة مرض السكري الخاصة بك؟ 1- نعم 2- لا 3- لا أعلم كم تدفع شهريا لإجراء التحاليل المخبرية؟ .....
القسم 3: مستوى وعي المريض بمرض السكري	
27	هل تعتقد أن مرض السكري يمكن أن يؤثر على عينيك؟ 1- نعم 2- لا 3- لا أعلم
28	هل تعتقد أن التحكم في نسبة السكر في الدم يمكن أن يساعد في الحفاظ على بصرك؟ 1- نعم 2- لا 3- لا أعلم
29	هل تعتقد أن مرض السكري يمكن أن يؤدي إلى فقدان البصر؟ 1- نعم 2- لا 3- لا أعلم
30	هل تعتقد أن هناك صلة بين مخزون السكر وتطور اعتلال الشبكية السكري؟ 1- نعم 2- لا 3- لا أعلم
31	هل تعتقد أن إجراءات تعديل نمط الحياة يمكن أن تؤثر على تقدم اعتلال الشبكية السكري؟ 1- نعم 2- لا 3- لا أعلم
32	هل تعتقد أنه من المهم لمرضى السكر فحص عيونهم سنويًا؟ 1- نعم 2- لا
33	هل تعتقد أنك بحاجة إلى إجراء فحص للعين عندما يتم التحكم في نسبة السكر في الدم لديك؟

	1- نعم 2- لا 3- لا أعلم
34	في اعتقادك، ما مدى جودة التحكم في نسبة السكر في الدم لديك؟ 1- ممتاز 2- جيد جدا 3- جيد 4- مقبول 5-سيئ
35	على مقياس من 1 إلى 5، ما مدى سعادتك بمعرفتك بمرض السكري؟ .....
36	ما هو برأيك أكبر عائق لعدم إجراء فحص للعين؟ (إجابات متعددة) 1- لا أعرف إلى أين أذهب 2- صعوبة الوصول إلى خدمات العناية بالعيون 3- ليس لديك معرفة عن مرض السكر 4- التكلفة/التأمين 5- الخوف من نتيجة الفحص 6- الحاجة للدعم الأسري 7- وجود أولويات اخرى 8- تكلفة المواصلات 9- لا شيء مما سبق
الجزء 2: عوامل النظام **القسم الأول: النظام الطبي:**	
37	في مركز الرعاية الأولية حيث تحصل على خدمات الرعاية الصحية، هل توجد عيادة لطب العيون؟ 1- نعم 2- لا 3- لا أعلم
38	في المستشفى / مركز الرعاية الأولية حيث تحصل على خدمات الرعاية الصحية الخاصة بك، هل يوجد اختصاصي تغذية؟ 1- نعم 2- لا 3- لا أعلم
39	المصدر الرئيسي للمعلومات حول اعتلال الشبكية السكري هو من (إجابات متعددة) 1- الطبيب 2-العائلة 3- الأصدقاء 4- الانترنت 5-اخرى، حدد.....
40	بالنسبة للاعتلال الشبكية السكري، هل تتلقى خدمات من أماكن أخرى غير هذه المستشفى؟ 1- نعم 2- لا إذا كانت الاجابة نعم، فمن اين تتلقى هذه الخدمات؟ .....
41	ما نوع الخدمات التي تتلقاها من هذا المستشفى؟ (إجابات متعددة) 1- استشارات 2- متابعة 3- فحوصات مخبرية 4- صرف أدوية 5- جراحة 6- ليزك
42	من أين تحصل على أدوية DR؟ (إجابات متعددة) 1- مستشفى سان جون 2-مستشفى النصر للعيون 3- مستشفى الأوروبي 4- مستشفى خاص 5- مراكز الرعاية الأولية 6- اخرى، حدد .....
43	كم التكلفة الشهرية للعلاج؟ ..... شيكل
القسم 2: وقت الانتظار والمسارات: خدمات مستشفى اعتلال الشبكية السكري	
44	هل كان من السهل الوصول إلى هذا المستشفى؟ 1- نعم 2- لا

	هل تأتي سيرا على الأقدام؟ 1- نعم 2- لا، لقد استخدمت وسائل النقل إذا كانت الاجابة نعم، كم من الوقت يستغرق وصولك؟ ..... دقائق إذا كانت الاجابة لا، استخدمت المواصلات، كم تدفع (ذهابًا وإيابًا) ..... شيكل هل تعتقد أن التكلفة التي دفعتها معقولة؟ 1- نعم 2- لا 3- أحيانا
45	بشكل عام، كم عدد الدقائق التي تنتظرها لتلقي الخدمات من المستشفى ..... دقائق
46	من وجهة نظرك، هل تعتقد أن إجمالي الوقت المستغرق خلال الزيارة هو؟ 1- معقول 2- طويل 3- قصير
47	إذا كان عليك القيام بإجراء معين في المستشفى، فهل كانت هناك قائمة انتظار طويلة قبل دورك؟ 1- نعم 2- إلى حد ما 3- لا
48	هل سألك الطبيب عن الوقت الذي يناسبك؟ 1- نعم 2- لا
49	هل طبيبك ملتزم بالموعد الذي يعطيه لك؟ 1- نعم، طوال الوقت 2- نعم، أحيانًا 3- لا
50	في حالة زيارة المستشفى للمتابعة هل تنتظر طويلاً لمراجعة الطبيب؟ 1- نعم 2- إلى حد ما 3- لا
51	إذا كان عليك إجراء الفحوصات المخبرية في المستشفى، فهل انتظرت طويلاً للحصول على الخدمات؟ 1- نعم 2- إلى حد ما 3- لا
52	إذا صرفت الأدوية الخاصة بك من هذا المستشفى، فهل تنتظر وقتًا طويلاً للحصول على الخدمات؟ 1- نعم 2- إلى حد ما 3- لا
53	ما هي التحديات / العوائق الرئيسية التي تواجهها فيما يتعلق بالخدمات التي تتلقاها من المستشفى؟ (إجابات متعددة) 1- محدودية طرق العلاج (خيارات قليلة) 2- ازدحام المستشفى 3- نقص الخدمات المتخصصة 4- ضعف التواصل مع الموظفين 5- طول فترة الانتظار 6- وقت الاتصال مع مقدم الخدمة قصير 7- مواعيد غير متكررة 8- نقص في التحاليل المخبرية 9- تشخيص نادر 10- عائقان أو أكثر 11 - لا يوجد
54	في العام الماضي، هل عدت إلى المنزل دون تلقي الخدمات؟ 1- نعم 2- لا إذا كانت الإجابة نعم، اذكر لماذا .....
القسم 3: التفاعل بين مزود الخدمة والمريض: مقدم خدمة اعتلال الشبكية السكري	
لكل عبارة أدناه، يرجى تحديد أحد الخيارات الخمسة: 1 = لا أوافق بشدة 2 = لا أوافق 3 = محايد 4 =	

موافق 5 = موافق بشدة						
تفاعل بين المريض ومزود الخدمة	1	2	3	4	5	
55	طبيبك مهذب ويتعامل معك بطريقة ودية					
56	خلال هذه الزيارة، سُمح لك بقول كل ما تعتقد أنه مهم دون مقاطعتك					
57	يتأكد الطبيب من أنك تفهم شروحاته وتعليماته					
58	الطبيب مستعد دائمًا لمساعدتك					
59	من الشائع أن يستخدم طبيبك لغة يصعب عليك فهمها دون تفسير كافٍ					
60	يشرح طبيبك مزايا وعيوب طريقة العلاج					
61	يشركك أطبائك في اتخاذ القرار المتعلق بعلاجك					
62	أخبرك طبيبك بالحقيقة حول مشكلة اعتلال الشبكية السكري الخاصة بك					
63	تتلقى ملاحظات حول نتائج اختبارات الشبكية هذه					
64	لديك ثقة في الفريق الطبي					
الجزء 3: المخرجات / نتيجة خدمات اعتلال الشبكية السكري						
القسم 1: المتابعة						
65	هل تجري زيارات متابعة بانتظام للتحقق من حالة اعتلال الشبكية السكري لديك؟ 1- نعم 2- لا إذا كانت الاجابة لا، فلماذا؟ • لا أستطيع تحمل تكلفة النقل • حركتي غير مستقرة • ليس لدي وقت - مشاكل في العمل - إجازة • أنا لا أرحب من قبل الموظفين • أنا لا أثق بمزودي الخدمة • أحتاج أن أكون برفقة شخص آخر • لا أعتقد أنه من المهم أن أقوم بمتابعة منتظمة • مزود الخدمة الخاص بي غير مؤهل • سببان أو أكثر • أخرى (حدد.....						
66	عدد زيارات المتابعة في السنة لمتابعة حالة اعتلال الشبكية السكري.....زيارة						
67	هل تعتقد أن زيارات المتابعة الخاصة بك كافية؟ 1- نعم 2- إلى حد ما 3- لا						
68	هل تم الاتصال بك من قبل مزود الخدمة لأنك لا تتابع بانتظام؟ 1- نعم 2- لا						

القسم 2: الرضا						
لكل عبارة أدناه، يرجى تحديد أحد الخيارات الخمسة 1 = راضٍ جدًا 2 = راضٍ 3 = محايد 4 = غير راضٍ 5 = غير راضٍ جدًا: تقييم اعتلال الشبكية السكري بشكل عام						
		1	2	3	4	5
69	أنت راضٍ عن علاج مشاكل العين المصابة بداء السكري					
70	تشعر أن علاج مشاكل العين المصابة بداء السكري يعمل بشكل جيد					
71	تشعر أن علاج مشاكل العين المصابة بداء السكري صعب عليك					
72	تشعر بالقلق حيال علاج مشكلة العين المصابة بداء السكري					
73	أنت راضٍ عن سلامة العلاج لمشكلة عينك المصابة بداء السكري					
74	أنت راضٍ عن الوقت الذي يستغرقه علاج مشكلة العين المصابة بداء السكري					
75	ما مدى رضاك عن المعلومات المقدمة حول علاج مشاكل العين المصابة بداء السكري؟					
76	أنت تشجع شخصًا آخر يعاني من مشاكل في العين المصابة بداء السكري مثل حالتك على علاج مشابه لك					
77	أنت راضٍ عن العلاج إلى الحد الذي ستستمر فيه أو تكرر العلاج لمشكلة عينك المصابة بداء السكري					
القسم 3: وجهات نظر المشاركين حول توافر الخدمات						
لكل عبارة أدناه، يرجى تحديد أحد الخيارات الخمسة 1 = لا أوافق بشدة 2 = لا أوافق 3 = محايد 4 = موافق 5 = موافق بشدة						
		1	2	3	4	5
78	تتوفر دائمًا اختبارات المتابعة مثل فحص الشبكية					
79	الرسوم / التكلفة التي تدفعها لتلقي الخدمات معقولة					
80	الخدمات في هذا المستشفى بأسعار معقولة لمعظم الناس في جميع أنحاء قطاع غزة					
81	يغطي التأمين الصحي جميع التكاليف المرتبطة بعلاج اعتلال الشبكية السكري					
القسم 4: جودة حياة مريض اعتلال الشبكية السكري (RetDQoL)						
82	بشكل عام، جودة حياتك الحالية هي: 1- ممتـاز 2 - جيـد جـدا 3 – جيـد 4 - لا جيـد ولا سـيئ 5 – سـيئ 6 - سـيء جـدا					

	7 - سيء للغاية					
	لكل عبارة أدناه، يرجى تحديد أحد الخيارات الخمسة: 1 = أفضل بكثير جدا 2 = أفضل بكثير 3 = أفضل قليلاً 4 = نفس 5 =أسوأ ملاحظة: تبدأ جميع البنود من 1 إلى 24 بالعبارة: إذا لم أكن أعاني من مشاكل في العين نتيجة داء السكر					
		1	2	3	4	5
83	يمكنني التعامل مع أعمالي المنزلية					
84	يمكنني التعامل مع أموري الشخصية (الرسائل، الفواتير، إلخ)					
85	ستكون تجربتي في التسوق					
86	ستكون مشاعري تجاه المستقبل (مثل المخاوف والآمال):					
87	ستكون حياتي العملية					
88	ستكون علاقاتي الشخصية القريبة					
89	يمكنني أن أفعل أشياء للآخرين كما أرغب:					
90	يمكنني الخروج والتنقل (على سبيل المثال سيرًا على الأقدام أو بالسيارة أو الحافلة أو القطار):					
91	سيكون وضعي المالي					
92	سيكون مظهري الجسدي (بما في ذلك الملابس والعناية الشخصية):					
93	ستكون ثقتي بنفسي					
94	سيكون الوقت الذي يستغرقه القيام بالأشياء هو					
95	كنت سأواجه حوادث مؤسفة أو سأفقد أشياء					
96	يمكنني القيام بالأشياء بشكل مستقل					
97	مشاعري حول الرعاية الطبية السابقة و / أو الرعاية الذاتية (مثل الغضب أو الندم) ستكون:					
98	ستكون صداقاتي والحياة الاجتماعية					
99	ستكون عطلتي					
100	سيكون رد فعل الناس معي بشكل عام					
101	يمكنني الاستمتاع بأنشطتي واهتماماتي الترفيهية (مثل القراءة والتلفزيون والراديو والهوايات					
102	سأجد العناية بمرض السكري (مثل الاختبار الذاتي، والأدوية، والطعام، والتمارين الرياضية					
103	هل تؤثر مشاكل العين نتيجة مرض السكر على جودة حياتك بأية طريقة لم يشملها الاستبيان؟ إذا كانت الإجابة بنعم، حدد					

104	هل توصي بمعالجة مشكلة اعتلال الشبكية السكري لأي من أقاربك وأصدقائك؟ 1- نعم 2 - لا إذا كانت الإجابة لا، فلماذا؟ .....
105	هل حققت خدمات اعتلال الشبكية السكري التي تلقيتها توقعاتك؟ 1- نعم 2- إلى حد ما 3- لا إذا كانت الإجابة "لا"، كيف تتوقع أن تكون الخدمات؟ 1- أفضل 2-أسوأ

Evaluation of Diabetic Retinopathy in the Gaza Strip

I'm Marian Jameel Soliman Saba, a student at Al-Quds University, School of Health Policy and Management/ Quality and Patient Safety track. You are chosen to be a participant in this research study entitled "*Evaluation of Diabetic Retinopathy in the Gaza Strip*." You are selected to patriciate in this study because you have met the selection criteria for participation. This study is being carried out as a part of the requirements for the master's degree in Health Policy and Management at Al-Quds University, School of Public Health–Palestine.

The aim of this study to assess the status of services are provided for patients with diabetic retinopathy in the Gaza Strip. Participating in the study will give you the opportunity to tell us about the status of diabetic retinopathy services provided to you in the Gaza Strip and your perspective about it. The findings and conclusions of this study may help in improving the services provided for diabetic retinopathy patients in the Gaza Strip. I appreciate your participation in this research study and you need to answer the interviewer's questions that do not take more than 20 minutes.

The findings will be used only for research purposes and will be presented at the aggregated level, without any reveal of any identification data. Data will not be shared with anyone, only the researcher will have access to the data. Confidentiality of the data will be provided and maintained. Even though I welcome your participation, participation is optional. You have the right to stop or end filling the questionnaire at any point in time and you also have the right to skip any question.

Thank you very much for your willingness to participate

Day …… Date …… Patient code ……. HbA1c……	
Part I: Patient Factors	
Section 1: Sociodemographic and economic variables of patient with diabetic retinopathy	
1	Place (by governorate): 1- North Gaza 2- Gaza 3- Deir Al-Balah 4- Khanyounis 5-Rafah
2	In which hospital do you receive treatment? (**Multiple Options)** 1-St. John hospital 2- Al Naser Ophthalmic hospital 3-European Gaza Hospital 4-Private hospital
3	Age in years ---------- years
4	Gender 1-Male 2-Female
5	Marital status 1-Single 2-Married 3-Widow 4-Divorced 5-Separated
6	Years of schooling ---------- years
7	Current working status? 1- Yes working 2- Not working 3- Retired a-If yes, what is your current work? ----------
8	What is the monthly income of your family (from all sources)? ---------- ILS
9	What is the reason of your today's visit? 1-Scheduled appointed- follow up 2- Walk-ins-visit 3- To do laser 7-Others, specify …. 6-To do diagnostic test 4-To do laboratory tests 5-for surgery
Section 2: Medical information about the diabetic retinopathy patient	
10	Which type of diabetes do you have? Type 1 Type 2
11	Since how many years you have DM? …… Year/s
12	Do you have other family member having DM? 1-Yes 2-No If yes, whom? (**Multiple answers)** Mother Father Sister Brother Husband Others, specify
13	Since when you were diagnosed with DR? ……

14	What is your treatment modality? **(Multiple answers)** 1-Diet control 2-Oral medication 3-Insulin 4-Lifestyle 5-Nothing
15	Would you describe yourself as? 1-Overweight 2-Underweight 3-Normal weight 4-Obese
16	Do you have other chronic diseases such as hypertension, hyperlipidemia, COPD? 1- Yes 2- No 1- Hypertension, 2- COPD, 3-heart diseases, 4, others, specify----- a-If yes, which diseases do you have b-If you have hypertension, is it under control? 1-Yes, most the time 2- yes, but not all the time 2-Not at all
17	Since how many years do you have hypertension ……. Years
18	Do you have another DM complication? 1-Yes 2-No 19a- If yes, Specify ……
19	Do you take your DM medicines regularly? 1-Yes 2-No 3-Sometimes 4-Often
20	Does your physician advise you to consult ophthalmologist for eye complications of diabetes? 1-Yes 2-No 3- I do not know
21	Does your ophthalmologist advise you to do eye check-up at least once every year? 1-Yes 2-No 3- I do not know
22	When was the last time you have done DR screening? 1-…… Month/s 2- Never ever done
23	Have you received feedback about that DR screening? 1-Yes 2-No a-If yes, did it have effect on your diabetic management plan? 1-Yes 2-No 3- I do not know
24	Have you undergone retinal surgery for diabetes in last year? 1-Yes 2-No 3- I do not know If yes, Where……
25	Have you undergone laser treatment for diabetic retinopathy in the last year? 1-Yes 2-No 3- I do not know If yes, where……
26	Do you do the annual laboratory analysis regularly? 1-Yes 2-No a-If yes when was the last lab analysis you did? Before.....month/s b- Have you received feedback about the results of the annual laboratory analysis? 1-Yes 2-No 3- I do not know c-What did your doctor say about HG A1C result? 1-Controlled (normal) 2-Uncontrolled (high /very high) 3-I do not know d-Did the result have effects on your diabetic management plan? 1-Yes 2-No 3- I do not know e- How much do you pay on monthly basis? …….

Section 3: Patient level of awareness about DM	
27	Do you believe that diabetes can affect your eyes? 1-yes 2-No 3- I do not know
28	Do you believe that controlling your blood sugar can help preserve your vision? 1-yes 2-No 3- I do not know
29	Do you believe that diabetes can lead to loss of vision? 1-yes 2-No 3- I do not know
30	Do you believe that there is link between HGA1c and DR progression? 1-Yes 2-No 3-I do not know
31	Do you believe that lifestyle modification measures can affect DR progression? 1-Yes 2-No 3-I do not know
32	Do you think it is important for diabetic patients to check their eyes annually? 1-Yes 2-No
33	Do you think that you need to do eye checkup when your blood sugar is controlled? 1-Yes 2-No 3- I do not know
34	How good do you believe your blood sugar control is? 1-Excelent 2-Very good 3-Good 4-Fair 5-Poor
35	On a scale of 1-5 how happy would you say you are with your knowledge about diabetes? .....
36	What do you think was the biggest barrier for not getting eye screening? (**Multiple answers)** 1-Do not know where to go 2-Lack of access to eye care 3-Do not have knowledge about DM 4-Cost/Insurance 5- Fear of discovery 6-Family support 7-Having other priorities 8- Transportation Cost 9-None
PART 2: SYSTEM FACTORS SECTION 1: MEDICAL SYSTEM:	
37	In the **primary care center** where you get the health care services, is there an ophthalmology clinic? 1-Yes 2-No 3-I don't know
38	In the **hospital/primary care center** where you get your health care services, is there a nutritionist? 1-Yes 2-No 3-I don't know
39	Your main source of information about Diabetic retinopathy is from (**Multiple answers)** -Internet 5- Other, please specify …… 41-Physician 2-Family 3-Friend
40	**For DR,** do you receive services from places other than this hospital? 1-yes 2-No If yes, from where do you receive these services?.....
41	What kind of services do you receive from **this hospital**? **(Multiple answers)** 1-Counselling 2-Follow-up 3-Lab tests 4-Medication dispensing 5-Surgery 6-Laser

42	From where do you get your DR medications? (**Multiple answers)** 1-St. John hospital 2-Naser ophthalmic hospital 3-European Gaza Hospital 4-Private hospitals 5-Primary Health Care center 6-Other, specify…….
43	How much do you pay on monthly basis? ……. ILS
Section 2: Waiting time & Pathways: **DR hospital services**	
44	Was it easy to reach to this hospital? 1- Yes 2- No Do you come on foot? 1-Yes 2-No, I used transportation If yes, how long it takes you to arrive? ------ minutes If no, you used transportation, how much do you pay (back and forth) ……. ILS Do you think the cost you paid is affordable? 1-Yes 2-No 3-Sometimes
45	Generally, how many minutes do you wait to receive the services from the hospital .....Minutes
46	From your point of view, do you think the total time consumed during the visit is? 1- Reasonable 2- Lengthy 3- Short
47	If you have to do specific procedure in the hospital, was there a long waiting list before your turn? 1-Yes 2- To some extent 3- No
48	Did the doctor ask you about the time that suits you? 1-Yes 2-No
49	Is your doctor committed to the appointment that they give to you? 1-Yes, all the time 2-Yes, sometimes 3-No
50	In case of hospital visit for a follow-up, do you wait for a long time to see the doctor? 1-Yes 2- To some extent 3- No
51	If you have to perform lab tests in the hospital, did you wait for a long time to get the services? 1-Yes 2- To some extent 3- No
52	If you dispense your medications from this hospital, do you wait for a long time to get the services? .1-Yes 2. To some extent 3. No
53	What are the main challenges/barriers you face with regard to the services you receive from hospital? **(Multiple answers)** 1- Limited availability of therapy ways (few options). 2- Crowdedness of the hospital 3- Lack of specialized services 4- Poor staff communication 5- Long waiting time 6-Short contact time with the provider 7- Infrequent appointments 8- Infrequent lab analysis 9- infrequent diagnosis 10-two or more barriers 11-None
54	In the past year, have you been returned home without receiving the services? 1- Yes 2- No If yes, indicate why ……
Section 3: Client's provider interaction: **DR service providers**	

For each of the below statement, please select one of the five options 1=Strongly disagree 2= Disagree 3=Natural 4=Agree 5=Strongly agree						
Patient provider interaction		1	2	3	4	5
55	Your physician is polite and deals with you in a friendly way.					
56	During this visit, you were allowed to say everything that you think is important without interrupting you					
57	The physician makes sure that you understand his explanations and instructions					
58	The physician is always willing to help you					
59	It is common that your physician uses a language difficult for you to understand without					

	adequate explanation.					
60	Your physician explains the advantages and disadvantages of the treatment modality					
61	Your physicians involve you in the decision-making related to your treatment					
62	Your physician told you the truth about your DR problem					
63	You receive feedback about the results of these retinal tests					
64	You have confidence in the medical team					
Part 3: output/outcome of DR services						
Section 1: Follow up						
65	Do you regularly conduct follow up visits to check the **DR status**? 1- Yes 2- No 89a- If no, why? □ I cannot afford transportation cost □ My movement is uneasy					

	□ I do not have time—work issues-leave □ I am not welcomed by staff □ I do not trust my provider □ I need to be accompanied by another person □ I do not think it is important that I do regular follow up □ My provider is not qualified □ two or more reasons □ Others, specify…….					
66	Number of follow up visits per year to follow the **DR status**. ----------. Visits					
67	Do you think that your follow-up visits are adequate? 1. Yes 2. To some extent 3. No					
68	Have you been approached by provider because you do not follow up regularly? 1- Yes 2- No					
Section 2: Satisfaction						
For each of the below statement, please select one of the five options 1=Very satisfied 2=Satisfied 3=Natural 4=dissatisfied 5= Very dissatisfied: DR in general						
		1	2	3	4	5
69	You are satisfied with the treatment for your diabetic eye problems					
70	You feel the treatment for your diabetic eye problems is working well					
71	You feel the treatment for your diabetic eye					

	problems is difficult for you					
72	You feel apprehensive about the treatment for your diabetic eye problem					
73	You are satisfied with the safety of the treatment for your diabetic eye problem					
74	You are satisfied with the time taken by the treatment for your diabetic eye problem					
75	How satisfied are you with the information provided about the treatmen					

	t for your diabetic eye problems?					
76	You encourage someone else with diabetic eye problems like yours to have treatment similar to yours					
77	You are satisfied with the treatment to the extent that you will continue or repeat the treatment for your diabetic eye problem					
Section 3: Participant's perspectives about the availability services.						
For each of the below statement, please select one of the five options 1=Strongly disagree 2= Disagree 3=Natural 4=Agree 5=Strongly agree						
		1	2	3	4	5
78	The follow-up tests like rental screening are					

	always available					
79	The fee/cost you pay to receive the services is reasonable					
80	The services in this hospital affordable to most people across the Gaza Strip					
81	The health insurance covers all the costs associated with RD treatment					

Section 4: Retinopathy Dependent Quality of Life (RetDQoL)	
87	In general, my present quality of life is: 1-Excellent 2- Very good 3- Good 4-Neither good nor bad 5- Bad 6- Very bad 7-E

For each of the below statement, please select one of the five options 1=Very much better 2= Much better 3= A little better 4=The same 5=Worse

NOTE: All items 1–24 begin with the phrase: If I did not have diabetic eye problems

		1	2	3	4	5
88	I could handle my household tasks					
89	I could handle my personal affairs (letters, bills, etc.)					

90	My experience of shopping would be					
91	My feelings about the future (e.g., worries, hopes) would be:					
92	My work life would be					
93	My closest personal relationship would be					
94	I could do things for others as I wish:					
95	I could get out and about (e.g., on foot, or by car, bus or train):					
96	My financial situation would be					
97	My physical appearance					

	(including clothes and grooming) would be:					
98	My self-confidence would be					
99	The time it takes me to do things would be					
100	I would have mishaps or would lose things					
101	I could do things independently					
102	My feelings about past medical care and/or self-care (e.g., anger or regret) would be:					
103	My friendships and social life would be					
104	My vacations would be					

105	The way people in general react to me would be					
106	I could enjoy my leisure activities and interests (e.g., reading, TV, radio, hobbies					
107	I would find taking care of my diabetes (e.g., self-testing, medication, food, exercise					
108	Do your diabetic eye problems affect your quality of life in any ways that have not been covered by the questionnaire? If yes, please describe……..					
109	Would you recommend the treatment for your DR problem to any of your relatives and friends? 1-Yes 2-No, If no, why?.....					
110	Have diabetic retinopathy services that you received met your expectation? 1-Yes 2-To some extent 3-No If no, how did you expect the services to be? 1-Better 2-Worse					

Annex (10): Focus groups interviews questions and consent form

نموذج موافقة

عزيزي/تي المشترك/ة

انا الطالبة/ ماريان جميل سليمان سابا، ملتحقة ببرنامج ماجستير سياسات وإدارة صحية كلية الصحة العامة بجامعة القدس.

انه لمن دواعي سروري ان تكون أحد المشاركين في هذه الدراسة والتي تهدف الي تقييم خدمات اعتلال الشبكية السكري في قطاع غزة، مما يساهم في تحسين جودة الخدمات المقدمة.

هذه الدراسة جزء من متطلبات برنامج الماجستير، كلية الصحة العامة.

اخي/اختي المشترك/ة سيقوم الباحث بإجراء جلسة مناقشة جماعية لمرضى اعتلال الشبكية السكري، في حال وافقت على المشاركة في هذه الدراسة عليك المشاركة في المناقشة والإجابة على الأسئلة المطروحة، مع العلم بما يلي:

- مشاركتك بهذه الدراسة طوعية، ويحق لك القبول او الرفض او الانسحاب في أي وقت.
- ستحتاج المناقشة الى حوالي 30 دقيقة
- لا يوجد أي إجابات صحيحة او خاطئة
- سيتم تسجيل النقاش
- السرية مكفولة ولن يتم ذكر أي اسم من أسماء المشاركين.

شكرا لتعاونك

الباحثة: ماريان جميل سابا

أسئلة المجموعة البؤرية المركزة

أنا طالبة ماجستير اقوم بإجراء بحث لرسالة الجامعة حول تقييم خدمات اعتلال الشبكية السكري. حيث سيتم الاستفادة من نتائج البحث في تحسين جودة الخدمات المقدمة. علما بأن مشاركتكم طوعية ولكنها مهمة في عملية التطوير.

1. أين تذهب بالعادة لتلقي الخدمة الصحية في حال الاحتياج لها؟

متى قررت بأنك باحتياج الى زيارة الطبيب، بماذا شعرت؟

هل قمت بزيارة طبيب العيون بشكل شخصي او تم تحوليك من قبل الطبيب المتابع من مركز الرعاية الاولية؟

2. ما هي الاسباب التي تعيق المرضى من تلقي الخدمات المقدمة من المستشفى؟

تكلفة العلاج/ المواصلات، ازدحام المستشفى والانتظار وقت طويل، عدم الاستفادة من الخدمة المقدمة، طريقة تعامل الطاقم، توافر اولويات اخرى، الاحتياج الى مرافق خلال الزيارة.

3.ما هي الاساليب او الاجراءات التي تتبعها لمتابعه الوضع الصحي المتعلق بمرض اعتلال الشبكية السكري وتقلقل المضاعفات؟

هل تقوم بإجراء فحص للشبكية بشكل دوري؟ ومتى كانت اخر مرة؟

هل تقوم بإجراء تحليل لمخزون السكر بشكل منتظم؟

هل تتبع نظام حياة صحي؟

هل تتناول العلاج بشكل منتظم؟

هل تقوم بمراجعه الطبيب بشكل منتظم؟

4.هل تم اعطاءكم معلومات كافية عن طبيعية المرض وعن نتيجة الفحوصات التي تم إجراءها والعلاج المستخدم، وهل تم مشاركتكم في طريقة العلاج المستخدمة مع توضيح مزايا وعيوب كل منها؟

هل كان مزود الخدمة يقوم باطلاعك بشكل واضح وصريح عن الوضع الصحي لك وعن نتائج التحاليل والفحوصات التي تم اجراءها؟

وهل كان مزود الخدمة يأخذ رأيك في خيارات العلاج المتاح موضحا مزايا وعيوب كل منها؟

وهل كان مزود الخدمة يقدم لك معلومات عن كيفية تحسين نوعية حياتك بطريقة تنعكس ايجابا على السيطرة على داء السكر؟

5. ما هو السبب الاساسي الذي منعك من علاج مرض اعتلال الشبكية السكري سواء من خلال استخدام الابر او بتقنية الليزك او جراحة؟

التكلفة /الخوف من النتيجة بسبب تجارب سلبية سابقة/ الشعور بان الوضع الحالي لا يتطلب هذا الاجراء.

6. ما هو مستوى رضاك عن الخدمة المقدمة

كيف تقييم مستوى رضاك عن الخدمة؟

ما هي اسباب عدم الرضا هل لها علاقة بشعورك بعدم الاستفادة من الخدمة المقدمة، اولها علاقة بطريقة تعامل الطاقم الطبي او صعوبة اخذ حجز للاستفادة من خدمة معينه، او ازدحام المشفى والانتظار لوقت طويل او بسبب الالم والاعراض الجانبية المرتبطة بالعلاج .....

ما هي اسباب رضاك عن الخدمة؟ وهل انت راضي عن الخدمة لدرجة تجعلك تستمر في تلقي الخدمة من نفس المشفى وان تنصح مريض اخر بتلقي العلاج في هذا المشفى؟

7. كيف اثرت الاصابة بمرض اعتلال الشبكية السكري على جودة حياتك؟

هل الاصابة اثرت على قدرتك على المشي او السياقة، هل اثرت على علاقاتك الاجتماعية، هل اثرت على جودة عنايتك بمرض السكري (اجراء الفحص اليومي، قراءة اسم العلاج او التعليمات المرفقة)، هل اثرت على نفسيتك ونظرتك اتجاه المستقبل؟

8. ما هي اقتراحاتكم لتحسين جودة الخدمات المقدمة من المشفى؟

هل زيادة عدد الطاقم المتوفر او تقليل المسافة بين زيارات المتابعة او توفير العلاج المناسب في جميع الاوقات او توفير تغطية جزئية او كاملة لتكلفة العلاج او من خلال توفير الاستشارات والنصائح الطبية وانظمة غذائية بشكل دوري تهدف الى تحسين وضع الصحي وتقليل المضاعفات المصاحبة لمرض السكري .....

9. هل لديك اي اضافات اخرى؟

شكرا لتعاونكم معنا

Annex (11): Key healthcare providers in-depth interviews questions

أسئلة المقابلات المعمقة مع اطباء العيون

1. مقارنة مع خدمات علاج اعتلال الشبكية السكري المقدمة من مراكز أخرى، بماذا يتميز مركزكم؟

2. هل يوجد سياسات ملتزم بها في المركز، باعتباره مقدما لخدمة علاج اعتلال الشبكية السكري؟ يرجى إيضاح هل يوجد بروتوكولات متبعة لعلاج اعتلال الشبكية السكري، وما هي؟؟وهل هذه البروتوكولات متاحة للطاقم. هل تم تدريبهم عليه؟ وهل يتم تحديثه دوريا؟

3. كيف تقيم مستوى التفاعل ما بين مقدمي الخدمة والفئة المستهدفة؟ هل يوجد ارشادات مكتوبة وهل يتم العمل بها؟ وما هي ادوات المستخدمة في متابعة والتقييم الاداء؟

4. من وجهة نظرك، ماهي العوامل التي قد تمنع المرضى من الحضور إلى المركز والاستفادة من خدماته؟

5. من وجهة نظرك، هل وجود تنسيق بين مراكز علاج اعتلال الشبكية السكري ومراكز الرعاية الاولية ممكن ان يكون له دور في تحسين جودة الخدمات المقدمة والمساهمة بالوصول الى نتائج أفضل على مستوى المرضى؟

6. ما هي اقتراحاتك لتحسين جودة الخدمات الصحية المقدمة من المستشفى؟

هل ترغب في اضافة شيء؟

شــكرا لك

Annex (12) Frequencies Working and gender

Gender			Frequency	Percent	Valid Percent	Cumulative Percent
Male	Valid	Yes	49	22.3	22.6	22.6
		No	139	63.2	64.1	86.6
		Retierd	29	13.2	13.4	100.0
		Total	217	98.6	100.0	
	Missing	System	3	1.4		
	Total		220	100.0		
Female	Valid	Yes	22	12.0	12.0	12.0
		No	156	84.8	85.2	97.3
		Retierd	5	2.7	2.7	100.0
		Total	183	99.5	100.0	
	Missing	System	1	.5		
	Total		184	100.0		

Annex (13) Type of DM and Years of suffering, Period Diagnosis with DR and Other Family Suffering from DM

Statistics

Which type of diabetes do you have			Years of Suffering from DM	Period of diagnosis with DR
Type I	N	Valid	47	46
		Missing	1	2
	Mean		8.51	3.6902
	Median		8.00	3.0000
	Std. Deviation		5.090	2.72447
Type II	N	Valid	355	350
		Missing	1	6
	Mean		13.67	4.3036
	Median		12.00	4.0000
	Std. Deviation		7.503	3.75552

Annex (14) Other Family Suffering from DM

Which type of diabetes do you have			Frequency	Percent	Valid Percent	Cumulative Percent
Type I	Valid	Yes	26	54.2	54.2	54.2
		No	22	45.8	45.8	100.0
		Total	48	100.0	100.0	
Type II	Valid	Yes	182	51.1	51.1	51.1
		No	174	48.9	48.9	100.0
		Total	356	100.0	100.0	

Annex (15) Multiple Comparisons LSD

Dependent Variable	(I) Governorates	Governorates (J)	Mean Difference (I-J)	Sig.
Patient level of awareness about DR	North Gaza	Gaza	2.64337	.322
		Dair Al Balah	3.34275	.374
		Khanyounis	11.30355*	.000
		Rafah	1.51735	.704
	Gaza	North Gaza	-2.64337	.322
		Dair Al Balah	.69938	.829
		Khanyounis	8.66018*	.000
		Rafah	-1.12602	.748
	Dair Al Balah	North Gaza	-3.34275	.374
		Gaza	-.69938	.829
		Khanyounis	7.96080*	.022
		Rafah	-1.82540	.678
	Khanyounis	North Gaza	-11.30355*	.000
		Gaza	-8.66018*	.000
		Dair Al Balah	-7.96080*	.022
		Rafah	-9.78620*	.009
	Rafah	North Gaza	-1.51735	.704
		Gaza	1.12602	.748
		Dair Al Balah	1.82540	.678
		Khanyounis	9.78620*	.009
Patient's provider interaction	North Gaza	Gaza	-.27812	.864
		Dair Al Balah	2.85970	.212
		Khanyounis	4.09893*	.022
		Rafah	4.84859*	.046
	Gaza	North Gaza	.27812	.864
		Dair Al Balah	3.13781	.113
		Khanyounis	4.37704*	.001
		Rafah	5.12670*	.017
	Dair Al Balah	North Gaza	-2.85970	.212
		Gaza	-3.13781	.113
		Khanyounis	1.23923	.557
		Rafah	1.98889	.457
	Khanyounis	North Gaza	-4.09893*	.022
		Gaza	-4.37704*	.001
		Dair Al Balah	-1.23923	.557
		Rafah	.74966	.740
	Rafah	North Gaza	-4.84859*	.046
		Gaza	-5.12670*	.017
		Dair Al Balah	-1.98889	.457
		Khanyounis	-.74966	.740
Satisfaction	North Gaza	Gaza	1.05127	.543

		Dair Al Balah	4.68090	.055
		Khanyounis	11.92705*	.000
		Rafah	5.74262*	.027
	Gaza	North Gaza	-1.05127	.543
		Dair Al Balah	3.62963	.085
		Khanyounis	10.87579*	.000
		Rafah	4.69136*	.040
	Dair Al Balah	North Gaza	-4.68090	.055
		Gaza	-3.62963	.085
		Khanyounis	7.24616*	.001
		Rafah	1.06173	.710
	Khanyounis	North Gaza	-11.92705*	.000
		Gaza	-10.87579*	.000
		Dair Al Balah	-7.24616*	.001
		Rafah	-6.18443*	.010
	Rafah	North Gaza	-5.74262*	.027
		Gaza	-4.69136*	.040
		Dair Al Balah	-1.06173	.710
		Khanyounis	6.18443*	.010
Availability of services	North Gaza	Gaza	2.98823	.127
		Dair Al Balah	5.68267*	.040
		Khanyounis	-7.73002*	.000
		Rafah	.29379	.920
	Gaza	North Gaza	-2.98823	.127
		Dair Al Balah	2.69444	.258
		Khanyounis	-10.71825*	.000
		Rafah	-2.69444	.295
	Dair Al Balah	North Gaza	-5.68267*	.040
		Gaza	-2.69444	.258
		Khanyounis	-13.41270*	.000
		Rafah	-5.38889	.095
	Khanyounis	North Gaza	7.73002*	.000
		Gaza	10.71825*	.000
		Dair Al Balah	13.41270*	.000
		Rafah	8.02381*	.003
	Rafah	North Gaza	-.29379	.920
		Gaza	2.69444	.295
		Dair Al Balah	5.38889	.095
		Khanyounis	-8.02381*	.003

LSD

(I) Governorates	(J) Governorates	Mean Difference (I-J)	Sig.
North	Gaza	-1.28214	.562
	Dair Al Balah	-13.15584*	.000
	Khanyounis	-17.63940*	.000
	Rafah	-15.95028*	.000
Gaza	North Gaza	1.28214	.562
	Dair Al Balah	-11.87370*	.000
	Khanyounis	-16.35726*	.000
	Rafah	-14.66814*	.000
Dair Al Balah	North Gaza	13.15584*	.000
	Gaza	11.87370*	.000
	Khanyounis	-4.48356	.119
	Rafah	-2.79444	.443
Khanyounis	North Gaza	17.63940*	.000
	Gaza	16.35726*	.000
	Dair Al Balah	4.48356	.119
	Rafah	1.68912	.583
Rafah	North Gaza	15.95028*	.000
	Gaza	14.66814*	.000
	Dair Al Balah	2.79444	.443
	Khanyounis	-1.68912	.583

*. The mean difference is significant at the 0.05 level.

Annex (16): Multiple Comparisons

LSD

Dependent Variable	(I) Working	(J) Working	Mean Difference (I-J)	Std. Error	Sig.
Satisfaction	Yes	No	-1.24994	1.62677	.443
		Retierd	4.38737	2.56657	.088
	No	Yes	1.24994	1.62677	.443
		Retierd	5.63731*	2.22881	.012
	Retierd	Yes	-4.38737	2.56657	.088
		No	-5.63731*	2.22881	.012
Availability. Services	Yes	No	5.88971*	1.79667	.001
		Retierd	.13049	2.83462	.963
	No	Yes	-5.88971*	1.79667	.001
		Retierd	-5.75922*	2.46159	.020
	Retierd	Yes	-.13049	2.83462	.963
		No	5.75922*	2.46159	.020

*. The mean difference is significant at the 0.05 level.

Dependent Variable: QOL

LSD

(I) Working	(J) Working	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Yes	No	10.24913*	2.11394	.000	6.0932	14.4050
	Retierd	6.84963*	3.33517	.041	.2928	13.4064
No	Yes	-10.24913*	2.11394	.000	-14.4050	-6.0932
	Retierd	-3.39950	2.89627	.241	-9.0934	2.2944
Retierd	Yes	-6.84963*	3.33517	.041	-13.4064	-.2928
	No	3.39950	2.89627	.241	-2.2944	9.0934

*. The mean difference is significant at the 0.05 level.

Annex (17): List of experts

No.	Name	Position
1	Dr. Yehia Abed	Al-Quds university
2	Dr. Bassam Abu Hamad	Al-Quds university
3	Gehad Okasha	MoH
4	Dr. Nuha Sharif	Al-Quds university
5	Dr.Hisham Al Faleet	St. John Hospital
6	Dr.Mohammed Taleb	Al Azhar University
7	Dr. Mohammed Al Hessi	Al Naser hospital
8	Dr.Yousef Aljeesh	Islamic University
9	Dr. Ahmed Al Halemey	St. John Hospital

Abstract in Arabic

دراسة بعنوان: تقييم اعتلال الشبكية السكري في قطاع غزة

إعداد: ماريان جميل سليمان سابا

إشراف: د. ختام أبو حمد

ملخص الدراسة

يؤثر اعتلال الشبكية السكري على ما يقارب ثلث الأشخاص المصابين بداء السكري، والذي يمكن أن يؤدي إلى ضعف البصر والعمى إذا لم يتم اكتشافه وعلاجه في الوقت المناسب. والى اعتلال الشبكية السكري آثار صحية واقتصادية كبيرة على الصعيد العالمي، وخاصة في بلدان مثل فلسطين حيث يتزايد انتشار مرض السكري بشكل كبير. يمكن الفحص الدوري والمنتظم والإجراءات العلاجية المناسبة والمتابعة المنتظمة في منع أو تأخير حدوث العمى. لسوء الحظ، توجد العديد من المعيقات التي تعيق المرضى من إجراء فحص دوري منتظم للعين. هدفت هذه الدراسة إلى تقييم إدارة اعتلال الشبكية السكري في قطاع غزة لتحسين جودة الخدمات المقدمة وبالتالي تحسين النتائج العامة للمريض.

منهجية الدراسة

تعتبر هذه الدراسة وصفية تحليلية كمية، أي أنها طريقة مختلطة تتضمن جمع بيانات نوعية وكمية. تم جمع البيانات الكمية من مرضى داء السكري الذين تم تشخيصهم سابقا بالاعتلال الشبكية السكري بغض النظر عن درجة الإصابة، والذين استخدموا خدمات اعتلال الشبكية السكري في احدى أماكن الدراسة، وهي المستشفيات الرئيسية الثلاثة التي تقدم خدمات طب العيون. في المجموع، شارك 404 مريضا في الدراسة الكمية. أما الدراسة النوعية، تم جمع البيانات من خلال خمس مجموعات نقاش مركزة مع مرضى السكري الذين يعانون من اعتلال الشبكية السكري، وكذلك تم إجراء مقابلات متعمقة مع خمسة من مقدمي خدمات طب العيون الذين لديهم خبرة في اعتلال الشبكية السكري. تم إجراء تحليل البيانات الكمية باستخدام برنامج SPSS، وتضمن التحليل إجراء أنواع مختلفة من الاختبارات الإحصائية. بالنسبة للبيانات النوعية، تم استخدام طريقة الترميز المفتوح الموضعي التحليلي.

نتائج الدراسة

أظهرت الدراسة أن 88.1٪ من المشاركين في الدراسة كانوا يعانون من مرض السكري من النوع الثاني مقارنة ب 11.9٪ منهم كانوا يعانون من مرض السكري من النوع الأول، وكان متوسط سنوات المعاناة من مرض السكري 13.07 سنة، وكان لدى 51.5٪ من المشاركين فرد آخر من العائلة مصاب بمرض السكري، وخاصة الأم والأب. 56.1 ٪ من المشاركين وصفوا أنفسهم بأنهم يعانون من زيادة الوزن أو السمنة. وكان حوالي 40٪ من المشاركين يعانون من مرض مصاحب آخر، بشكل رئيسي ارتفاع ضغط الدم، و15.3٪ من المشاركين في الدراسة عانوا من مضاعفات أخرى لمرض السكري، وخاصة من اعتلال الأعصاب الطرفية.

معظم المشاركين في الدراسة (90٪) تناولوا أدويتهم بانتظام. وفيما يتعلق بالاعتلال الشبكية السكري، بلغ متوسط سنوات المعاناة من اعتلال الشبكية السكري 4.23 سنوات. من بين المشاركين في الدراسة، أفاد 66.3٪ من المشاركين أن أطبائهم نصحوهم باستشارة طبيب العيون، وأفاد 88.3٪ منهم أن طبيبهم نصحهم بإجراء فحص سنوي للعين، وأفاد 86.7٪ من المشاركين أنهم أجروا زيارات متابعة منتظمة، وكان السبب الرئيسي لزيارة المشاركين هو المتابعة بنسبة 73٪. ومن بين المشاركين في الدراسة، كان لدى 70.4٪ سهولة في الوصول إلى خدمات اعتلال الشبكية السكري، وكان العائق الرئيسي لعدم انتظام زيارات المتابعة هو نقص الدعم الأسري بنسبة 33.7٪، يليه عائق التكلفة إما تكلفة النقل أو تكلفة الخدمة، بنسبة 24.3٪، و23.3٪ على التوالي.

بالنسبة للتحاليل المخبرية، 86.1٪ من المشاركين في الدراسة قاموا بعمل التحاليل المخبرية السنوية، وأفاد 89.9٪ منهم أنهم تلقوا تعليقات حول نتائج تحاليلهم المخبرية، وأفاد 42.3٪ فقط من المشاركين بأن لديهم مخزون السكر HbA1c منتظم مقارنة ب 53.6٪ كان مخزون السكر HbA1c لديهم غير منتظم و4.1٪ منهم لا يتذكرون نتيجة التحليل. من بين المشاركين في الدراسة، أبلغ 71٪ عن عدم وجود تغطية تأمينية كاملة وأنه لا يزال يترتب عليهم دفع ثمن الخدمات.

وبلغ متوسط مستوى وعي المشاركين في الدراسة حول اعتلال الشبكية السكري 86.8٪. أفاد 51.6٪ فقط من المشاركين أن الخدمات تلبي توقعاتهم. بلغ متوسط وقت الانتظار 57.02 دقيقة، وبلغ متوسط التفاعل بين المريض ومقدم الخدمة 77.4٪. وفيما يتعلق برضا المرضى عن الخدمات المقدمة، بلغ متوسط الرضا 75.56٪ وارتبط بشكل كبير بالعمر والجنس وحالة العمل. في حين أن متوسط جودة حياة مريض اعتلال الشبكية السكري كان 67.91٪، وكان مرتبطا بشكل كبير بالحالة الاجتماعية وسنوات الدراسة وحالة العمل.

الخلاصة

على الرغم من وجود مستوى جيد من الوعي لدى المرضى حول اعتلال الشبكية السكري، إلا أن أقل من نصف المشاركين قد سيطروا على مستوى مخزون السكر في الدم (HbA1c)، وهو العامل الرئيسي في الوقاية من مضاعفات مرض السكري، بما في ذلك اعتلال الشبكية السكري. ولقد تم توعية المرضى حول اعتلال الشبكية السكري بعد تشخيص إصابتهم به. ويمكن تفسير ذلك من خلال التركيز المحدود على الرعاية الذاتية لمرض السكري، عدم كفاية التثقيف حول الوقاية من مضاعفات السكري المحتملة، وبرامج الفحص المحدودة، وعدم كفاية وقت الاتصال مع مقدمي الرعاية الصحية الأولية، وعدم كفاية عدد مقدمي الرعاية الصحية المتخصصين في التعامل مع اعتلال الشبكية السكري. بالإضافة إلى عدم وجود إرشادات مناسبة لإدارة اعتلال الشبكية السكري في المستشفيات الحكومية.

يمكن أن يساعد الكشف المبكر والإدارة السليمة في تقليل المزيد من المضاعفات والفقدان الكلي للبصر. يمكن للبرامج التعليمية التي تستهدف العامة حول مرض السكري واعتلال الشبكية السكري والتعليم الطبي المستمر حول إدارة مرض السكري من تحسين رعاية مرضى السكري والإدارة الذاتية وبالتالي منع اعتلال الشبكية السكري والمضاعفات الأخرى.