**Deanship of Graduate Studies**

**Al – Quds University**

# Evaluation of Type 2 Diabetic Services at UNRWA Health Centers-Gaza Governorate

**Osama Abed Qader Hammad**

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# Evaluation of Type 2 Diabetic Services at UNRWA Health Centers - Gaza Governorate

Prepared by

**Osama Abed Qader Hammad**

Bachelor Degree of General Medicine-Victor Babeș University of Medicine and Pharmacy, Timișoara -Romania.

**Supervisor: Assistant Prof. Dr. Khitam Abu Hamad**
PhD, School of Public Health- Al-Quds University
Gaza, Palestine

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## Thesis Approval

# Evaluation of Type 2 Diabetic Services at UNRWA Health Centers-Gaza Governorate.

Prepared By: Osama Abed Qader Hammad
Registration No.: 21510088

Supervisor: Dr. Khitam Abu Hamad

Master thesis submitted and accepted. Date: / /
The names of signatures of the examining committee members are as follows:

1. Head of committee: Dr. Khitam Abu Hamad Signature.....
2. Internal examiner: Prof. Dr. Yehia A. Abed Signature.....
3. External examiner: Dr. Rami Eid Al Abadlah Signature.....

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## Dedication

I dedicate this dissertation to the memory of my late mother, here spirit inspired me throughout conducting this study

To my extraordinary father and my beloved wife "Mona" for being the greatest source of inspiration, unlimited support, and encouragement

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

To the light of my eyes... my kids

I dedicate this research for all of them…

Osama Abed Qader Hammad

## 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:**

Osama Abed Qader Hammad.

Date: --------/---------/---------

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Yours faithfully

Osama Abed Qader Hammad

## Abstract

*Non-communicable diseases are among the main causes of mortality and morbidity globally. One of the main non-communicable illnesses is type 2 diabetes mellitus. In the Gaza Strip, the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) is one of the main health providers for non-communicable diseases, including type 2 diabetes mellitus. This study intended to evaluate the provided services to type 2 diabetes mellitus clients at UNRWA health centers in the Gaza Strip. The study aimed to propose recommendations to improve the quality of the provided services and thus improving the overall wellbeing of clients. The study design was a mixed methods study; it involved both quantitative and qualitative data. The quantitative data was collected from beneficiaries who utilized type 2 diabetes mellitus health services at UNRWA health centers within the study settings( 6 primary health centers randomly selected). In total, 408 patients participated in the quantitative study. The qualitative data was collected through 4 focus group discussions with type 2 diabetes mellitus health providers (primary health care doctors and nurses). Analysis of quantitative data was conducted using the SPSS program, the analysis involved different types of statistical tests. For qualitative data, an open coding thematic analysis method was used.*

*Results showed that 99% of study participants received their type 2 diabetes mellitus health care services exclusively from UNRWA, 72.1% had another co-morbidity, mainly hypertension. Participants had good type 2 diabetes mellitus knowledge with a score of 76.87%. About 89% had easy access to UNRWA type 2 diabetes mellitus health services. UNRWA type 2 diabetes mellitus services met the expectation of 95.8% of participants. The main barriers for UNRWA type 2 diabetes mellitus services from participants perspective were long waiting time (77.4%) and crowding of health center (40.2%). A total of 74% of the study participants did not receive any kind of type 2 diabetes mellitus self-care education, the main type 2 diabetes mellitus health education was done nurses (85.8%). About 95% of the study participants conducted regular follow up visits to UNRWA's health centers, and the main causes of missing follow up visits were the patient busy (65%), followed by the incapability (physical) to move (30%). For scanning screening, 62.5% of participants did their annual eye screening, 73.8 % of participants did their foot screening and 93.6 % of participants did their annual laboratory analysis. Study participants perceived that UNRWA type 2 diabetes mellitus services were of quality by 87.43%, and fell satisfaction with 84.07 %. Overall perceived quality was a statistically significant associated with participants place, gender, and smoking status. According to HbA1c, the controlled participant's percentage (≥7%) was 23.8% and the rest were uncontrolled(76.2%). The level of HbA1c was statistically significantly associated with participants gender and smoking status.*

*The present study concluded that despite the good perceived quality, good type 2 diabetes mellitus complications screenings and patients type 2 diabetes mellitus knowledge, the glycemic control by HbA1c is poor. This could be explained by limited focused on diabetic self-care, insufficient health education, limited communication between health provider and patients, and very short contact time. More studies are needed to evaluate the determinants of controlling status. UNRWA needs to increase the contact time, improve the quality of provided services by strengthening the monitoring and supervision.*

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## List of Abbreviations

| | |
|---|---|
| **AADE** | American Association of Diabetes Educators |
| **ADA** | American Diabetes Association |
| **ANOVA** | Analysis of Variance |
| **CDC** | Center for Disease Control and Prevention |
| **DM** | Diabetes Mellitus |
| **DM 1:** | Diabetes Mellitus type 1 |
| **DM2:** | Diabetes Mellitus type 2 |
| **ESRD** | End Stage Renal Disease |
| **GS** | Gaza Strip |
| **IDDM** | Insulin-Dependent Diabetes Mellitus |
| **IDF** | International Diabetes Federation |
| **MOH** | Ministry of Health |
| **NIDDK** | National Institute for Diabetes and digestive and kidney Disease |
| **NIDDM** | Non -Insulin-Dependent Diabetes Mellitus |
| **oPt** | Occupied Palestinian Territories |
| **PCBS** | Palestinian Central Bureau of Statistics |
| **SMBG** | Self-Monitoring of Blood Glucose |
| **SPSS** | Statistical Package for the Social Sciences |
| **UNRWA** | United Nations Relief and Works Agency for Palestine Refugees in the Near East |
| **WB** | West Bank |
| **WHO** | World Health Organization |

# Chapter One:

## Introduction

### 1.1 Background

Diabetes Mellitus (DM) is a set of metabolic conditions in which there is elevated blood glucose levels over an extended period (World Health Organization (WHO), 2016a). Indications of elevated blood glucose include recurrent urination, thirst, and hunger. If left unmanaged, DM can cause a lot of complications (WHO, 2013). Acute complications can lead to coma and may be death (Kitabchi et al., 2009). Long-standing diabetes may lead to severe complications like heart disease, cerebrovascular attacks, renal impairments, foot damage, and eye diseases (WHO, 2013).

DM is one of the most prevalent chronic diseases worldwide, mainly due to an increase in life expectancy as people live longer, advancement in technology, availability of drugs, and adopting sedentary lifestyle such as physical inactivity, eating food high in carbohydrates and sugar. Consequently, these changes are leading to an unprecedented increase in the prevalence of non-communicable diseases, including DM (WHO, 2016 b). Generally speaking, in 2016, the global prevalence of diabetes was 8.5% among adults (WHO, 2016 b).

A total of 451 million of people were diagnosed with DM around the world and may be increased to 693 million by 2045. Nearly half of diabetic people (49.7%) are undiagnosed. In 2017, globally there were approximately 5 million deaths due to DM. DM has also considerable influence on health financing in which the world healthcare expenditure on diabetic patients was approximately 850 billion USD in 2017 (Cho et al., 2018).

DM is a global public health issue; however, despite the prevalence of DM is higher in developed countries than developing countries, the major upsurge in DM rates are reported in low- and middle-income nations (WHO, 2016b). The increase in DM prevalence rates in developing countries results from the change in lifestyle that involves progressively more sedentary lifestyles, performing little physical activities and the changing in foods styles like excessive eating foods of high calories but poor of nutrients (Wild, 2004).

In Palestine, according to International Diabetes Federation (IDF), the estimated prevalence among adults in 2018 was 7% (IDF, 2019). According to the Ministry of Health (MoH), the number of new registered DM in the West Bank was 6313 cases, distributed as 2792 cases among males with an incidence rate of 213 per 100000 populations and 3521 cases among females with an incidence rate of 279.9 per 100000 populations (MoH, 2018).

DM complications ranked as the fifth among the major causes of death in Palestine in 2017 with a proportion of 9% (MoH, 2018). WHO has established two essential goals in managing diabetic patients: the first is to keep the health and quality of life of diabetic patients by effective health education. The second is to manage diabetes complications, that lead to reduce morbidity and mortality (Alwan, 1996).

## 1.2 Problem Statement

Palestine, like most of Arab countries, has been moving into epidemiological transition that characterized by rapid shifting of disease profile from communicable diseases to non-communicable diseases, mainly, diabetes and hypertension.

The impact of DM on morbidity and mortality is incredibly increasing. Currently, DM is the fifth cause of death according to MoH (MoH, 2018). However, the burden of DM includes the consequences of DM, such as cardiovascular diseases, strokes, and neuropathy. Additionally, DM is a main risk factor for other two leading causes of death in Palestine, namely cardiovascular diseases and strokes. Providing DM clients with preventive and curative services is a mandate for the main health providers in Palestine. The scope of services involves early detection of diabetic cases, effective management of diabetic patients, and early screening of diabetes long and short-term complications.

In the Gaza Strip (GS), the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) is one of the key health providers for non-communicable diseases, including DM. It serves approximately 1.3 million of Palestinian refugees (UNRWA, 2018). In 2017, a total 43586 diabetic clients have had received services from UNRWA, 31.6 % of type 2 DM clients were on insulin therapy and according to risk score, 15.4 % with high-risk score. (UNRWA, 2018). To the researcher best knowledge, limited studies were conducted to evaluate the health services provided to

diabetic clients. Thus, this study will be among first to solely and comprehensively focus on evaluating the diabetic services.

## 1.3 Justification and Significance of the Study

UNRWA provides treatment for all DM clients free of charge in its 22 clinics, including curative and preventive services. The curative services include anti-diabetic treatments, general outpatients' treatment, dental care, and preventive care. The preventive services include annual fundus examination, periodical foot examination, and different annual analysis like microalbuminurea, creatinine, and cholesterol to early detection of DM complications.

This study will provide policy makers with evidence that could be used to improve the quality of the provided services. The study will also provide decision makers with the main gaps of the provided services, thus, addressing these gaps could improve the effectiveness of provided services. Finally, the study will assess the outcomes of the provided services, namely, HgA1C and percentage of clients who have had benefited from the complication screening program. This in turn will provide policy makers with evidence about the outcomes of the provided services and the researcher will propose recommendations that could lead to improve the outcomes, thus, improve the overall clients' wellbeing.

## 1.4 Aim of the Study

The overall aim of this study is to evaluate the provided services to DM clients at UNRWA health centers in the GS to propose suggestion to improve the quality of the provided services.

## 1.5 Objectives

- To assess clients' perceived quality of the provided health care services to DM clients at UNRWA health centers in the GS
- To determine to which extent DM health care services improve the health outcomes of clients at UNRWA health centers in the GS
- To assess the DM clients' satisfaction with the provided services
- To identify the main areas of strengths and weaknesses of DM health care services at UNRWA health centers in the GS

- To propose recommendations for policy makers to improve the effectiveness and efficiency of the provided services

## 1.6 Research Questions

1. What are the current available DM health care services at UNRWA health centers in the GS?
2. From clients' perspectives, are the provided services for DM clients of good quality?
3. Are DM health care services improve the health outcomes of clients at UNRWA health centers in the GS?
4. Are DM clients satisfied with the provided services?
5. What are the strength and benefits of DM health care services?
6. What are the weakness of DM health care services?
7. What are the impacts of these services on beneficiaries' overall health status?

## 1.7 Study Context

### 1.7.1 Demographic and Geographic Context

Palestine is a small country located in Southwest Asia on the Mediterranean Sea that shares borders with four countries: Jordan, Lebanon, Syria, and Egypt border. According to the Palestinian Center Bureau of Statistics (PCBS), the total number of Palestinians globally was 12.7 million in 2016 (PCBS, 2017).

According to PCBS Population, Housing and Establishments Census 2017, the population of Palestine reach 4.78 million, 2.43 million men and 2.35 million women. West Bank (WB) is more populated with 2.88 million, while GS was 1.90 million. In 2017, people aged less than or equal to 14 years formed about 38.9% of the total population , of which 36.9% in the WB and 41.8% in GS. The people aged more or equal to 65 years formed 3.2% of the total population of which 3.6% in the WB and 2.8% in GS in 2017. Population density of Palestine is varying according to the geographical area, in GS it is 5,204 persons/$km^2$ compared to a WB of 510 persons/$km^2$ in 2017 (PCBS, 2018a).

### 1.7.2 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 and recurrent wars (Elshaer, 2016). People suffer from the constricted siege that prevents importing and exporting of goods and aids across the GS borders.

The Palestinian economy has severely damaged because of the current political situation and the siege imposed on the GS. Since the end of the second intifada, Israel has imposed a blockade on the GS in addition to recurrent wars and other attacks on the territory resulted in degraded economic conditions and mass destruction of infrastructure and industry. Israel-Gaza border closures, which became more limiting after Hamas held control of the GS in June 2007, have resulted in high unemployment, high poverty rates, and collapse of the private sector that had depended on mainly on export markets (Al-Qedra, 2018).

According to the Labour Force Survey Results Fourth Quarter (January– March, 2018) Round, the participation of people equal and over 15 years in labour force was 45.4% with a total individuals number of 1,340,200 in the 1$^{st}$ quarter 2018; 820,900 in the WB and 519,300 in GS. In WB, the participation rate was 44.9% and 46.2% in GS, the difference between men and women in the participation rate still very high , 70.3% for men compared with 19.9% for women (PCBS, 2018b).

In GS, the unemployment rate reach 49.1% but in WB it was 18.3% in the 1$^{st}$ quarter 2018, and for men it was 25.0% but for women it was 48.9%. young people (20-24 years), had the peak unemployment rate in the 1st quarter 2018 (49.6%) (PCBS, 2018b).

### 1.7.3 The Gaza Strip (GS)

The GS comprises a narrow zone of land located in the southwest part of Palestine with about 1.91 million inhabitants; it is composed of five governorates: North Gaza, Gaza, Dier Alballah, Khanyounis, and Rafah (PCBS, 2017). In the oPt, Gaza governorate has the second highest number of population with 13.4% of the total population, which comes after Hebron with 15, 1% of the total population (PCBS, 2017). Although, the GS is a narrow place of land, it is considered to have one of the highest population densities in the world; in 2017 the population density /km$^2$ was 5204 (PCBS, 2018a).

### 1.7.4 Healthcare System

The Palestinian healthcare system is a mixture and mainly composed of four healthcare providers: the first is the MoH which is the main healthcare provider and provides primary, secondary, and tertiary health care services, for primary health care, MoH operates 472 primary health clinics (PHCs); 54 in GS and 418 in WB (MoH, 2016). The second provider is UNRWA that provides health programs concentrated on comprehensive, preventive, and primary healthcare, services covering health care, family health, disease prevention and control, and health promotion. All of these services are provided free of charge for refugees. UNRWA runs 64 PHCs; 22 in GS and 42 in WB. The third provider is the Non-Governmental Organizations (NGO's) which provides primary, secondary, and tertiary healthcare services for the population; it owns and operates about 185 PHC centers in Palestine. Finally, the private sector, which has hundreds of private settings that are operated mainly by private individuals, medical specialists, dentists, physicians, laboratory technicians and x-ray technicians (MoH, 2016).

### 1.7.5 UNRWA

UNRWA established in 1949 as agency for relief and human development, initially projected to offer works and straight relief for Palestine refugees who fled or obliged to expel from their homes during Israeli-Arab fight after termination of the British mandate over Palestine (Dowty, 2012). Since 1949, UNRWA has been providing services to Palestinians in five geographical areas: GS, WB, including East Jerusalem, Jordan, Lebanon, and Syria.

Because of absence of a just solution to the Palestinian refugees' problem, the General Assembly has renewed UNRWA's mandate until 30 June 2020. Today, UNRWA offers education, health care, and social services to at least 5 million registered Palestine refugees.

#### 1.7.5.1 UNRWA Health program

Since 1950, UNRWA has been one of the key healthcare providers for the Palestine refugees (UNRWA, 2016). Essential health needs are provided through a network of primary care health centers, presenting access to hospitals, food aid, and refugee camps

environmental health maintenance. Currently, the 22 primary health facilities at GS have a total of 1005 employees.

In 2017, the total number of medical consultation was 3,858,497 at GS, the total non-communicable disease (NCD) patients were 84,039, from which 43586 suffer from DM. The DM health services at UNRWA include antidiabetics' drugs provision, systemic follow up, DM complication screening, self-care educations (UNRWA, 2018). The prevalence of DM among served population ≥40 years of age, 2017 at GS according to UNRWA annual health report 2017(2018) was 13.1% (UNRWA, 2018).

## 1.8 Operational Definitions

### Evaluation

This is an organized process of learning from experiences, and using the learned lessons to improve current activities and stimulate healthier planning by carefully selecting future alternatives actions (WHO, 1981).

### Client perceived service quality

Perceived quality was defined by Aaker (1991), as the client's opinion of the overall product or service quality or superiority , take in consideration the intended purpose, relative to alternatives. Perceived quality is, first, a perception by customers (Aaker, 1991).

### Client satisfaction

Client satisfaction is the degree to which the patient’s desired expectations, goals or preferences are met by the health care provider or the service (Debono & Travaglia, 2009).

### HbA1c

The term HbA1c refers to glycated hemoglobin. It appears when hemoglobin, a protein within red blood cells of the blood, attaches to glucose and become 'glycated'. By determining HbA1c, doctors can form an overall picture of the average blood glucose levels over a period of 12 weeks or 3 months . We will use the UNRWA HbA1c classification of control status, mainly: controlled if equal or below 7%, and uncontrolled if above 7%.

**Utilization of diabetes complications screening**

The percentage of clients who have been benefited from the DM complications scanning program, mainly the screening of DM retinopathy by using fundus eye examination, and the screening for diabetic foot by using manometer and Doppler.

**Contact time**

The time spent by health care provider with the DM2 client.

# Chapter Two

## Conceptual Framework and Literature Review

### 2.1 Conceptual Framework

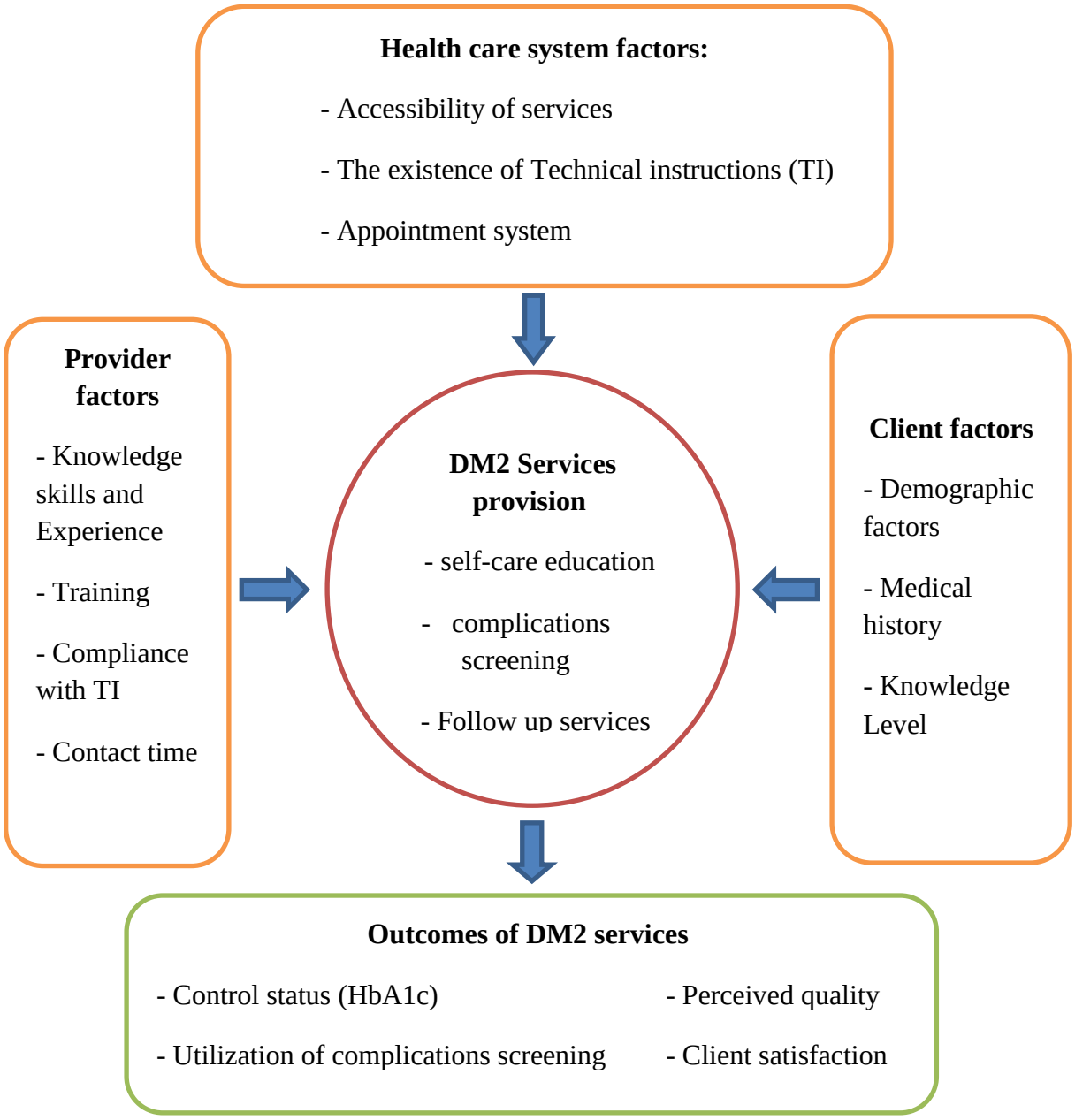


**Figure (2.1): Conceptual framework**

The 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 the DM2 services. For this study, the proposed framework consists of three categories:

(1) Clients' factors such as demographics, medical history, and knowledge level.

(2) Providers' factors such as knowledge, experience, training, and compliance to protocols, and contact time.

(3) Health care system factors such as accessibility, the existence of technical instructions and the appointment system.

All these factors will affect the DM2 service provided to diabetics namely: self-care education, complications screening, and disease follow up procedures. All the previous factors will affect and contribute to the outcome status of being control or not measured by HbA1c, the utilization rate of complications screening, client satisfaction, and client perceived quality.

**1- Providers Factors**

Several factors play an important role in the health care providers' practices, such as knowledge, experience, training, and the compliance to technical instructions. These factors are essential to provide quality services by health care providers.

**2- Healthcare System Factors**

The value of any service is less when the healthcare system provides inefficient access. The important features for access are access to information, financial access and affordability of services, availability of resources for diagnosis and availability of skilled health professionals.

- Availability of protocols and guidelines is important but the implementation is the cornerstone in the introducing of services in a proper and organized way.
- The availability of guidelines and its implementation leads to keep resources from wasting and getting on high-quality services when the guidelines are available.
- Appointment system: an effective will lead to a decrease in waiting time, increase contact time, and finally will lead to increase client satisfaction.

**3- Client Factors**

The client factors include socio-demographic characteristics, knowledge level, and medical history.

- Socio-demographic factors such as age, income, place and marital status might have an impact on health care seeking behaviors and treatment outcomes, so in this study, we will explore if there is a relation between these factors and the provision of DM2 services.
- The medical history of DM2 patient affects the nature of services needed, as the co-existence of chronic hypertension will lead to added prevention measures.
- Knowledge refers to DM2 patient understanding of DM management and self-care guidelines and recommendations.

**DM2 services provision**

The previous factors (client, provider, and system) will affect the provision of main DM2 care activities.

**A- DM2 self-care education**

Newly diagnosed patients need to be offered a full package of knowledge and awareness about the DM, which includes the early signs of hypo and hyperglycemia, treatment options, diet, exercise, follow up and others. After the first visit, the patient receives regular health education every visit to ensure good adherence to appropriate knowledge.

**B- DM2 complications screening services**

To early detect complications of DM2, clients need to regularly conduct eye screening to detect DM retinopathy, microalbuminuria to detect early changes in kidney, and periodical foot examination to prevent DM foot by early management of any foot problems.

**C- Follow up services**

It includes different types of tests and procedures to monitor the DM2 patient general situation, like fasting blood glucose, which gives a real but momentary picture about the level of glucose, unlike the HbA1c give a picture about the blood sugar in the last 3 month,

and it is best to monitor the blood sugar. Lipid profile and body mass index will reflect the adherence to lifestyle management, and monitor the weight reduction.

**Outcomes of DM2 services**

In this research, we will look for four important outcomes, first: the control status as measured by HbA1c, as it considered the most reliable, and sensitive indicator related to complications and mortality caused by DM2.

Second, patient satisfaction, which will reflect the fulfillment of these services to the patients' needs and meet their expectation.

Third, utilization rate of complications screening will reflect directly the prevention measures toward the DM2 complications, which have an immense benefit on client future wellbeing.

Forth, perceived quality which is the customer's perception of the overall quality of the provided services.

## 2.2 Literature review

### 2.2.1 Types of Evaluation

#### 2.2.1.1 Formative Evaluation

This type of evaluation is generally conducted to assess the strengths and weaknesses of any program with scope of improving the quality and effectiveness of that program. It ensures the suitability and feasibility of the program and acceptance before the complete implementation of the program. (Centers for Disease Control and Prevention (CDC), 2012).

#### 2.2.1.2 Summative Evaluation

It takes place during the project implementation, but in most cases, performed at the end of the project; and sometimes recommended for both quantitative and qualitative methods to attain good assessments. It is important to distinguish the outcome from the output. This type of evaluation is conducted at the end of any program in order to improve future implementation of the programs and to help decision-makers to decide about the continuity of the program (Fitzpatrick et al., 2011).

#### 2.2.1.3 Process Evaluation

Process evaluation can be determined during program activity and after implementation to know the output results. It is good to do the process evaluation periodically during the conduction and implementation of a program and the results can help to improve and strengthen the ability of the program as well as to monitor how the program is working and to obtain any warning for any problem may occur (CDC, 1999).

### 2.2.2 Diabetes Mellitus (DM)

#### 2.2.2.1 Introduction

DM is caused by a shortage of insulin produced by pancreas or resistance of body cells to the insulin (David, 2011). There are three core types of DM:

- Type 1 DM(DM1) results from the failure of Pancreas to secrete sufficient insulin. This form was termed before as "Insulin-Dependent Diabetes Mellitus" (IDDM) (WHO, 2016b).

- Type 2 DM (DM2) starts with insulin resistance to insulin, in which cells cant react normally to insulin (WHO, 2016b). As the DM2, progresses the deficit of insulin may also happen (Tripathy, 2012). This form was termed before as "Non -Insulin-Dependent Diabetes Mellitus" (NIDDM) (WHO, 2016b).
- Gestational Diabetes is the third form of DM, it happens when a negative history of DM pregnant have a high blood glucose levels (WHO, 2016b).

Both type I DM and Gestational Diabetes are beyond the scope of this study

#### 2.2.2.2 Global burden

Over the world, approximately there are 422 million diabetic people in 2014, compared to 108 million in 1980. The international prevalence (age-standardized) of DM has closely doubled since 1980, increasing from 4.7% to 8.5%. Over the last decade, DM prevalence increased faster in low- and middle-income countries compared to high-income countries. (WHO, 2016a). DM may be the reason of 1.5 million deaths in 2012. In addition to enforcing the risks of heart and other diseases. Low- and middle-income countries have higher DM related death percentage than in high-income countries (WHO, 2016a).

#### 2.2.2.3 Local Burden

In Palestine, according to IDF, the estimated prevalence among adults in 2018 was 7 % (IDF, 2019). According to the MoH annual health report 2017 (2018), the number of new registered DM at the WB was 6313 cases, distributed to 2792 cases among males with an incidence rate of 213 per 100000 populations and 3521 cases among females with an incidence rate of 279.9 per 100000 populations (MoH, 2018).

According to UNRWA annual health report 2017 (2018), the percentage of served population 40 years with DM in GS was 13.1 % (UNRWA, 2018). Furthermore, according to Abed Rahim and Colleagues (2001), who investigated the diabetes prevalence and related factors among Palestinian population of 492 men and women aged 30-65 years. They found DM in 12.0% of the survey population (including 9.4% previously diagnosed), and impaired glucose tolerance in 5.9% (Abdul-Rahim et al., 2001).

#### 2.2.2.4 DM complications

The morbidity and mortality of DM are due to its implication in many diseases pathology, like heart, kidney and eye chronic diseases. These diseases are highly medical expenditures consumers, for example heart diseases consume around 50-75% of health expenditures (CDC, 2016).

DM complications include the following: microvascular, macro-vascular, and neuropathic. high blood glucose is the main cause of microvascular and metabolic complications. The macro-vascular disease is less related to hyperglycemia.

The most common and serious complications that DM can cause are:

**a.** DM retinopathy

In USA, the main cause of blindness in people from 20 to 74 years is DM retinopathy, which leads to 12,000-24,000 newly blind people yearly. According to the National Eye Institute, the risk of diabetic blindness can be reduced by 90% by laser surgery and appropriate follow-up care (National Institute for Diabetes and Digestive and Kidney Disease (NIDDK), 2011).

**b.** End-stage renal disease(ESRD)

DM, and particularly DM2, is the major risk factor to end-stage renal disease (ESRD). According to the CDC, DM contribute to 44% of all new cases of ESRD (CDC, 2017a).

**c.** Neuropathy and vasculopathy

DM is the main reason of non-traumatic lower limb amputations, with an increase of about 15- to 40-fold compared to non-diabetic population (NIDDK, 2011).

**d.** Cardiovascular disease

Coronary heart disease (CHD) risk is increased 2-4 times diabetics compared to normal people. Heart disease is a leading reason of death in DM2 patients. About two-thirds of diabetics deaths is due to heart disease or stroke. Diabetic males are double of risk for

CHD, and diabetic females have triple to quadruple increased risk of CHD (Lawrence, Wackness & Steeven, 2009).

#### 2.2.2.5 Management of DM

According to UNRWA technical instructions and management protocols on prevention and control on non-communicable diseases (2009), the objectives of DM management are the following:

- To relieve symptoms by achieving optimal glycemic control .
- To correct associated health problems.
- To prevent and/or delay the development of early and/or late .

Complications:

- To observe the complications development and early intervention.
- To enhance the diabetic quality of life and productivity .

To achieve these objectives, UNRWA provide a set of services, which consist mainly from DM self-care education (diet, exercise and others), DM complication screening (fundus eye exam, foot exam, annual laboratory analysis), follow up services (blood sugar, blood pressure, body mass index, risk assessment), in addition to specific drugs prescription (UNRWA, 2009).

##### 2.2.2.5.1 DM self-care education

Self-care in DM is a process of getting knowledge or awareness by learning to deal with DM complexity (Cooper, 2003; Paterson, 2000). DM self-care activities are behaviors anticipated by patients with or at risk of DM to deal with the DM by their self (American Association of Diabetes Educators (AADE), 2008). There are seven main self-care behaviors in DM patients, which have an impact on the outcomes. These are healthy diet, exercise, blood glucose monitoring, treatment adherence, problem-solving technics, coping technics and risk-decrease attitudes (AADE, 2008). The seven behaviors were connected to appropriate sugar status, delaying of complications and enhancement in the life quality (American Diabetes Association (ADA), 2009; Povey, 2007; Odegard,2007; Deakin,2005; Boule,2001).

**DM self-care education**

According to UK Prospective Diabetes Study (UKPDS) (1998), participation on DM self-care education, immensely influence the progression and development of DM (UK Prospective Diabetes Study (UKPDS) Group, 98). This participation can be more effective if both diabetics and their care givers aware of the importance of DM self-care education.

The American Association of Clinical Endocrinologists stresses the significance of diabetics active role in their management (American College of Endocrinology, 2002). Also, the WHO has also recognized the significance of patients education to self-manage their DM (Hendra, 97). According to ADA, patients who had not received diabetic self-care education had quadruple increased in risk of complications (Mensing, 2006).

A study done by Williams (1998), found that self-management education for DM2 patients improved the glycemic control immediately, but when the education stopped, the benefit decline, suggesting the importance of continuing education (Williams, 1998).

**DM self-care activities**

Some examples of self-care activities are a diet management, like decreasing foods rich in fat, enhance physical exercises, self-monitoring of blood glucose and care of foot (Glasgow & Strycker, 2000). Despite that lowering HbA1c could be the ultimate object of DM self-care but the change of patient behavior also is valuable (Walker, 1999).

Self-monitoring of glycemic control is a keystone of DM care to achieve and maintain the care targets. Role of monitoring is to assess the overall glycemic control and to ensure the appropriate steps to achieve optimum control.

**Compliance to self-care activities**

Despite that DM patients can delay the forming of late complications by enhancing self-care activities, the compliance to DM self-care is low (Marrero et al., 2000). Kotwani and Colleagues (2007), found that diabetics compliant to treatment is 30% and this percentage is increased in poor (Kotwani et al., 2007). According to Coyle and Colleagues (2013), who conduct a systemic review about self-management activities in DM care and found that compliant to diabetic regimen is varied according to blood sugar monitoring, diet,

exercise, and care of (Coyle et al., 2013). Gopichandran and Colleagues (2012) studied the DM self-care activities in India, they found that diet and exercise are poor but blood sugar monitoring and treatment compliance is good (Gopichandran et al., 2012).

Other research studies have recommended that health care providers should change their diabetic patient self-care management according to patient responsibility of self-care management (Ockleford et al., 2008).

**Dietary management**: According to UNRWA technical instructions and management protocols on prevention and control on non-communicable diseases (2009), diet is a fundamental part of diabetic management, its cant be successful without appropriate consideration of patients understanding and applying the concepts and principles of dietary modification.

**Physical exercise**

Regardless of weight reducing , participating in systematic exercise will lead to improving the DM management outcomes (ADA, 2011; Colberg, 2010; Physical Activity Guidelines Advisory Committee, 2008; Mora, 2006). The National Institutes of Health (2008) and the American College of Sports Medicine (2007) advice that diabetics need to ensure in systematic exercise for at least 30 minutes three times weekly.

Exercise supports loss of weight and enhance lowering the blood sugar by improving the insulin sensitivity. Together with appropriate diet, exercise is essential for diabetic clients (UNRWA, 2009).

#### 2.2.2.6 DM complication screening

Annual DM complication screening is important for all individuals with DM. The purpose of such screening is to detect any potential complication at an early stage and intervene with lifestyle changes or medications to reduce the risk of progression.

NIDDK recommend the following tests for diabetics:

- HbA1c minimum twice a year
- Blood lipid profile: once a year
- Kidney function tests: Once yearly, (Albuminuria in addition to serum creatinine

- Blood pressure: periodically at each appointment
- Fundus eye exam: once yearly
- Foot exam: periodically at each appointment (NIDDK, 2016)

UNRWA technical instructions recommend the same tests with the same timetable except for HbA1c, its once yearly (UNRWA, 2009).

#### 2.2.2.6.1 DM eye screen

Like any other area of the body, DM severely affects the eyes, both by aggravating preexisting eye conditions like glaucoma and cataract, and also by generating new conditions like DM retinopathy (Holland, 2016).

DM retinopathy is generated when retinal blood vessels damaged. This damage can lead to many symptoms from blurring of vision to (Holland, 2016).

The duration with DM is playing a crucial role in developing DM retinopathy (Holland, 2016).

**Risk factors for DM retinopathy**

a) Pregnancy
b) Length of time with DM: The longer duration of DM, the greater the risk of complications, including DM retinopathy
c) Poor disease management: The risks for developing complications are higher if the DM is not under control. Strict glycemic control is the most effective tool in preventing DM retinopathy
d) Other medical conditions: Like hypertension, cardiac diseases
e) Smoking: People with DM who smoke are more likely to develop retinopathy (Holland, 2016)

For DM 2, due to DM 2 take many years to be diagnosed, the ADA recommends doing the initial eye exam directly after diagnosis (ADA, 2015).

A study, conducted by Zhang and Colleagues (2010), found that the DM retinopathy prevalence reach about one-third of diabetics over age 40 years. The African-Americans and Mexican-Americans are more affected (Zhang et al., 2010).

DM retinopathy is considered the main preventable causes of blindness. Early detection and management can save approximately 90% of diabetics from blindness (CDC, 2018).

**Comprehensive dilated eye exam.**

The exam may reveal many pathologies like swelling or bleeding of retinal blood vessels or growth of new retinal vessels. (National eye institute, 2018).

The percentage of diabetic patients did their annual eye exam in USA in 2010 was 62.8% compared to 57.0% in 1994. (CDC, 2014a).

#### 2.2.2.6.2 DM foot screen:

DM foot complications are the most serious and expensive complications of DM. Diabetic patient any time is at 25% risk of suffering from foot ulcer (Boulton, 2008). Foot ulcer is always preceding the foot amputation (Bakker, Apelqvist & Schaper, 2012).

**Diabetic foot management**

- Systematic foot checking
- Identification of risky foot
- Patient and Family awareness
- Appropriate footwear
- Treatment of non-ulcerative diabetic foot
- Foot examination must be done at least once yearly, and according to exam result, it can be repeated more frequent (Bakker, Apelqvist & Schaper, 2012)

In USA, the percentage of diabetic patients who did their annual foot exam in 2010 was 67.5%, and the percentage of diabetic patients who inspect their feet daily is 61.1% at 2010 (CDC, 2014b).

#### 2.2.2.6.3 Annual Laboratory analysis

According to UNRWA technical instructions 2009 and its updates, every DM patient has to do annual laboratory analysis that include the following: HbA1c, serum Creatinine, serum cholesterol, and urine albumin (UNRWA, 2009).

#### 2.2.2.7 Factors affecting diabetes management

##### 2.2.2.7.1 Health care system factors

**1- Accessibility to diabetes services**

According to Thiede, Akweongo & McIntyre (2007), access has three dimensions: The first dimension is the physical accessibility which refer to the presence of appropriate health services within reasonable reach to needed people, including reasonable opening hours, effective appointment system and others service management that permit the patients to get the needed services when they need them. The second dimension is the financial affordability, which reflects the ability of patients to pay for services without financial catastrophic results. Finally the third dimension is acceptability of services which reflects the willingness of people to seek services, its considered low when patients perceive services as ineffective or culturally unaccepted (Thiede, Akweongo & McIntyre, 2007).

According to the CDC (2016) the USA, the percent of peoples who failed to obtain needed medical care due to cost was 4.4% (CDC, 2017a).

Brundisini and Colleagues (2013), investigate the experience of accessing the medical care in rural and remote areas by chronic disease patients and found that geographic distance from health services cause access barriers, aggravated by moving problems or climate circumstances (Brundisini et al., 2013).

**2- Appointment system.**

DM care and management guidelines and objectives were suggested by ADA and Healthy People 2020 with main goal of reducing the prevalence and financial burden of DM (ADA, 2012; Department of Health and Human Services, 2012). The core benefit of these guidelines to enable individualized DM for each patient (ADA, 2012).

57.4% of USA diabetic patients ever attended DM self-care management in 2010, also 68.5% checked their HbA1c twice yearly, but only 63.6% of diabetic patients did daily self-monitor of blood sugar (CDC, 2012).

Factors that contribute to poor DM care appointment compliant are many and including socio-demographic, psychological, ,illness, under specific management, provider characteristics, and organizational characteristics (Delamater, 2006). Studies reveal that diabetics patients miss appointment rates fluctuate from 4 to 40 % (Turkcan, 2013). Studies also show that DM patients not compliant to appointments have worse DM outcomes like elevated HbA1c levels and bad glycemic control compared to diabetic patients who respect appointments (Turkcan, 2013).

A systemic review by Nuti and Colleagues (2015), about the effect of enhancing appointment system on DM outcomes, they revealed that minor actions like phone or letter reminder of DM appointment could improve the DM outcomes (Nuti et al., 2015).

**3- Technical instructions (TI)**

At UNRWA, there are guidelines and technical instructions (protocols) applied to follow at UNRWA health centers. These protocols organize the work precisely and in discipline way according to WHO standards. Technical guidelines are always important for health aspects involving managing several conditions, to ensure efficiency according to international technical standards and with an update to maintain technical soundness (UNRWA, 2011b). The protocols are issued and used by UNRWA to make the actions of its staff members or divisions are predictable, and presumably of higher quality.

A previous study by Entwistle and Colleagues (1999) revealed that protocols and guidelines offer patients benefits, and clinical guidelines are one of the options to improve quality of care. In addition, considered as a good solution for health care problems. The greatest benefits achievement by guidelines is to improve health outcomes (Entwistle et al., 1999).

**2.2.2.7.2 Provider factors.**

**1- Knowledge, skills and experience.**

Alotaibi and Colleagues (2016), studied the nurses' knowledge and barriers of DM , they found that nurses suffer from serious lack of DM knowledge and DM care (Alotaibi et al., 2016). The same results in regarding to DM self-management education were found by Hollis, Glaister & Anne Lapsley (2014). Interestingly, Van Zyl & Rheeder (2008) studied

the knowledge and attitudes of doctors and nurses about DM, and they revealed that doctors have more DM knowledge (68.3%) compared to nurses (53.3%) (Van Zyl & Rheeder, 2008).

**2- Staff training.**

Murugesan and Colleagues (2009), assessed the immediate effect of primary care doctors training about DM, they revealed that DM knowledge considerably improved after the training (Murugesan et al., 2009).

Vaidya and Colleagues (2012), studied the effects of training on DM management using computer-based training program, they found that comfort and knowledge are improved, especially the insulin administration practices (Vaidya et al., 2012). Finally, Van Zyl & Rheeder (2008), who studied the DM knowledge and attitudes, revealed that 80.9% of health care providers agreed on the necessity of training about the DM management (Van Zyl & Rheeder, 2008).

**3- Compliance with protocols.**

The guidelines and protocols of healthcare offer essential assistance to health care giver in offering the best practices by prescribing the correct steps and actions needed to be taken in specific situation (Barrow & Gasquoine, 2018).

A systematic review by De Belvis and Colleagues (2009), assessed the compliance of primary care providers to Evidence-Based Medicine (EBM) tools, and the possibility of enhancing the DM2 care, they revealed that compliance to EBM instruments may enhance the care process and also the outcomes (De Belvis et al., 2009).

Feldman, Rosen & DeStasio studied the nursing homes for DM (2009), they found that 15% had established treatment policy, only 1 of 13 facilities had a plan for quality enhancement, 7.1% had a policy to improve HbA1c level and finally only 30.8% had stabilized plan for blood sugar monitoring (Feldman, Rosen & DeStasio, 2009).

**4- Contact time**

As before defined in the operational definitions, contact time refers to the time spent by health care provider with the DM client. According to UNRWA annual health report 2017

(2018), average consultation time per doctor was 3.11 minutes (including the DM clients) (UNRWA, 2018).

Diab & Hamad (2015), assessed the UNRWA nurses workload at the health centers on GS, , they found that the Non-Communicable Disease (NCD) patient have an average contact time of 3.08 minutes (Diab & Hamad, 2015).

Robbins and Colleagues (1993), investigated the family medicine clinic patient satisfaction and found that patient appreciate the time consumed by the health provider in health education and management details (Robbins et al., 1993).

Like and Zyzanski (1987) evaluated the patient satisfaction determinants in family medicine clinic, they found that patients who had less contact time with providers were less satisfied (Like and Zyzanski, 1987). Same consistent findings were reported by Morrell and Colleagues also by Ridsdale and Colleagues, in which they revealed that clients felt they get not enough contact time with health provider in appointments less than 5 minutes compared to appointments from 10 to 15 minutes (Morrell et al., 1986; Ridsdale et al., 1989)**.**

#### 2.2.2.7.3 Client Factors

**1- Demographic Factors**

A retrospective study done by Wilf-Miron and Colleagues (2010) in Israel, to explore disparities in DM prevalence, care and control among diabetic with different socio-demographic characteristics. They found that DM was more prevalent among males, lower socioeconomic rank (SER) patients, Arabs, immigrants and owners of supplementary voluntary health insurance (SVHI). Best follow up was more among females, lower SERs patients, non-Arabs, immigrants and SVHI owners. Same study has also concluded that being be female, coming from higher SERs, being non-Arabs, immigrants and SVHI owners, are determinants of better DM control (Wilf-Miron et al., 2010). Consistently, several studies found that the demographic profile of patient (age, marital status) and the socioeconomic profile (income, educational level) had an effect on the perception of health care and the satisfaction of the patient (Alrubaiee & Alkaa'ida, 2011). Finally, Ibraheem and Colleagues (2013) have found significant association between the overall patient satisfaction and all demographic variables except marital status and monthly income. Age

and place of residence appeared to be independent predictors of satisfaction (Ibraheem et al., 2013).

**2- Medical Profile**

A cross-sectional study conducted by Al Shahrani and Baraja (2014) to assess satisfaction of diabetics clients and contributing factors in primary health care, they revealed that 86% of diabetics had another comorbidities, from which hypertension and abnormal lipid profile were the common (Al Shahrani & Baraja, 2014). According to Parchman and Colleagues (2002), existing of two or more comorbidities suffer from informational access difficulties (Parchman et al., 2002). Such clients complains frequently from the health care system (Thiedke, 2007).

**3- Patient Knowledge**

Diabetic patients need the Knowledge of DM to assume informed decisions about many important aspects of DM management like diet, physical activity, weight loss, blood sugar monitoring and others aspects of DM management (Murata et al., 2003). According to many studies, the DM knowledge is commonly weak among diabetic patients (Wee et al., 2002; Al-Maskari et al., 2013; Deepa et al., 2014).

Deepa and Colleagues (2014) research revealed that 43.2% of study participants had heard about DM . They also found that 63.4% of diabetics had a knowledge that DM can be prevented and 72.7% of them knew that DM can affect other organs (Deepa et al., 2014). Consistently, a research done in Pakistan by Rafique(2006), revealed that 53% of diabetics patients had poor DM knowledge especially the manifestations and complications of DM (Rafique et al., 2006).

Finally, the difference in patients' level of knowledge about DM was also proven by Islam and Colleagues (2015). Islam and Colleagues (2015) have conducted across-sectional study about the DM knowledge and glycemic control among patients with DM2 in Bangladesh. They found that 45.6% of DM2 patients had good, 37.7% moderate and 16.7% poor knowledge on DM. DM Knowledge was related to many factors like; education, gender, monthly income, duration of DM, body mass index, family history of DM, and marital status but not with HbA1c (Islam et al., 2015).

#### 2.2.2.7.4 Outcomes of DM2 services

##### 2.2.2.7.4.1 Control status by HbA1c

Normal ranges for HbA1c in people without DM is about 4% to 5.9%. People with DM with poor glucose control have HbA1c levels above 7%, decreasing HbA1c levels by 1% may decrease the risk of microvascular complications (for example, diabetic eye, nerve, or kidney disease) by 10% (Davis, 2018).

To ensure that ADA recommends an HbA1c goal of less than 7.0%, and advice to check it every six months in controlled patients and every three months among uncontrolled patients (ADA, 2018).

**Factors affecting the controlling status of DM as assessed by HbA1c**

**1- Gender**

A systematic review study was done by Willer & Kousy (2015) to determine the impact of gender on glycemic control and hypoglycemia among insulin-treated patients with DM2. They found that significant differences in the level of HbA1c between both sexes, women have a higher level of HbA1c and usually need a higher dose of insulin (Willer & Kousy, 2015). Another cross-sectional study by Chole, Muge, & Shuguan (2013), with a sample of 87.284 patients to evaluate whether hemoglobin level and gender affect HbA1c levels. They found that women had a lower mean HbA1c value compared with men, also there was a gender-specific association between age and HbA1c (Chole, Muge, & Shuguan, 2013).

**2- Age**

Another cross-sectional analysis was done among adults known to have DM to determine whether age differences affect by using HbA1c for screening and management. The results of the study have shown that blood glucose tolerance and HbA1c increased with age. A multivariate analysis was done and it showed that the relationship between age and HbA1c remained significant after adjusting other covariates including race, body mass index, and glucose level (Doubeuez & Xue, 2014).

**3- Years of education**

The literature review revealed different influences of patients years education to the controlled status of DM. For example a study conducted by Ali and AL Rasheedi (2014) to evaluate the impact of the educational level on glycemic control among patients with DM2. The study showed that the education level has no impact on glycemic control, but the patients of high education level had a better awareness of the complications and a high rate of adherence to diet (Ali & Al Rasheedi, 2014).

Another research study aimed to assess the burden of DM2 in Sweden attributed to lower educational levels. The result of the study showed that 17.2% of the diabetes burden in men and 20.1% of the burden in women attributed to lower educational levels in Sweden when combining all age groups. The conclusion was that there is a considerable burden of DM2 attributed to lower educational levels in Sweden (Emilie & Anna, 2011).

Another literature review study conducted in the US in 2014 to examine the current understanding of the social determinants of health that could affect DM and health. The study showed that education attainment that linked to improved health outcomes of DM patients possibly because of a greater likelihood of socio-economic stability compared to those with lower levels of education. Other related factors also derived from opportunities for better employment (Clark & Utz, 2014).

**4- Smoking**

Literature review showed that smoking have great effect on control status of DM. A cohort study of 34 stopped smoking patients were followed for 1 year and continued not to smoke for 1 year, two control group were randomly selected, one control group was current smokers and the other group was individuals who never smoke. HbA1c measured for all of them. The results of the study showed that stopping smoking lead to drop of HbA1c by 0.7%. (Jenny & Guntonm, 2002).

Another study by Debroah, Lina, and Ronan (2015), it was retrospective cohort study of adult smokers with DM2 using the Health Improvement Network (THIN), a large UK primary care database. The study showed that HbA1c increased by 0.21%, within the first year after quitting then start to decrease as stopping smoking continue after that (Debroah, Lina, & Ronan, 2015).

**5- Disease duration**

A cross-sectional study done by Yigazu and Desse (2017) about glycemic control and associated factors among DM2 patients at Southwest Ethiopia, revealed that the level of education ($p < 0.001$) and duration of DM treatment ($p < 0.001$) were significantly associated with glycemic control (Yigazu & Desse, 2017). Same consistent findings were reported by Khattab and Colleagues (2010) to determine factors associated with poor glycemic control among Jordanian patients with DM2, they found that longer duration of DM and not adherent to DM self-care management behaviors were associated with poor glycemic control (Khattab et al., 2010).

Consistently, logistic regression analysis done by Chan and Colleagues (2008) to identify factors of achieving HbA1c <7% in 11,799 patients (1,898 DM1 and 9,901 DM2) recruited by 937 physicians from 17 countries in Eastern Europe, they found that in DM2, short disease duration and treatment with few oral glucose-lowering drugs were predictors for achieving the HbA1c goal (Chan et al., 2008).

**6- Association of other chronic diseases - Comorbidities**

DM comorbidities have great effect on DM control status, according to Long & Dagogo-Jack (2011), Up to 75% of adults with DM and hypertension, and patients with hypertension alone often show evidence of insulin resistance. Thus, hypertension and DM are common, intertwined conditions that share a significant overlap underlying risk factors (including ethnicity, familial, dyslipidemia, and lifestyle determinants) and complications (Long & Dagogo-Jack, 2011).

Consistently, a systemic review done by Colosia, Khan & Palencia (2013) to identify observational studies of hypertension and/or obesity prevalence in patients with DM2 throughout the world, they found that around the world, hypertension and obesity, separately or together, are common comorbidities among adults with DM2 (Colosia, Khan & Palencia, 2013).

Same consistent findings were reported by EL Halabi (2018) to examine the relationship between social determinants of health and control status among DM2 patients at UNRWA health centers in Gaza governorate, she found that there is a statistically significant relation between HbA1c level and coexisting of hypertension (EL Halabi, 2018).

**7- DM knowledge and practices**

The literature review showed that there is positive relationship between DM knowledge and practices with DM control status. For example, a cross-sectional study was conducted by Al-Qazaz and Colleagues (2011), to investigate any association of knowledge and medication adherence with glycemic control in patients with DM2, they found that patients' knowledge about DM is associated with better medication adherence and better glycemic control (Al-Qazaz et al., 2011).

Consistently, a cross-sectional study by Al-Maskari and Colleagues (2013), to evaluate knowledge, attitude, and practices of DM patients in the United Arab Emirates, found that thirty-one percent of patients had poor knowledge of DM, seventy-two had negative attitudes towards having the disease and 57% had HbA1c levels reflecting poor glycemic control. Knowledge, practice and attitude scores were all statistically significantly positively, but rather weakly, associated, but none of these scores was significantly correlated with HbA1c (Al-Maskari et al., 2013).

Same consistent findings were reported by Chavan and Colleagues (2015) revealed that only 23.8% had good knowledge regarding DM, while 19.2% of participants had poor knowledge. Knowledge was significantly associated with the compliance to the pharmacological and non-pharmacological management (Chavan et al., 2015).

**2.2.2.7.4.2 Perceived quality**

Quality of DM care is critical to achieving successful DM treatment outcomes. The importance of incorporating the perspective of the patient when evaluating and designing health care programs which are centered on the factors associated with patients' perceived quality of DM care, is now widely recognized, most especially in the developed countries (Hekkink et al., 2003; Oluwole et al., 2013). The usage of patient-based assessments of medical care to measure the quality of health care (Ajayi et al., 2005; Peltzer, 2009).

Patients perceive and assess the quality of care being received in different dimensions such as medical personals attitude, the interpersonal relationship of health workers, waiting time, communication between doctors and patients, next appointment date, respect for patient's opinion during consultations, respect for patient's preference and so on. (Faxelid et al., 1997; Lesley, 1999; Akande, 2002; Jenkinson et al., 2002; Margolis et al.,

2003; Oyo-Ita et al., 2007; Bleich et al., 2009; Doubova et al., 2009; Tung & Chang, 2009; Sambo et al., 2010).

Several studies have identified prolonged waiting times as the main component of patient dissatisfaction which affects the perceived quality of care (Ademola-Popoola et al., 2005; Eze & Okaro, 2006; Chisholm & Askham, 2006; Ariba et al., 2007; Tung & Chang, 2009).

Evidence from Isla (2011), however, suggests that in the assessment of health care services, patients often feel left out regarding their health and therefore not able to provide feedback as a result of not being listened to, respected, trusted and included in decision making. Assessment of quality of DM care can help health care providers reappraise current practices and ensure patients always get the best form of care. (Isla, 2011).

Kerr (2008) noted that it is important to capture important elements of how patients with chronic disease perceive the quality of care received when looking at how to implement measures to assess patients' perspectives of quality of care. (Kerr, 2008)

According to Pouwer and Snoek (2002), many studies have shown that satisfaction with medical care is associated with glycaemic control and risk of DM complications (Pouwer & Snoek, 2002).

Patients' experiences with the health system will determine their attitude toward health institutions; determine their return visit, compliance with treatment and achievement of better treatment success (Olumide, 1997). Therefore, monitoring of patients' experiences of health care can provide organizations with a yardstick against which to measure the quality of their services (Coulter & Ellins, 2006).

According to Tung and Chang (2009) study about the patient satisfaction with and recommendation of a primary care provider: associations of perceived quality and patient education, they found that doctor's technical skill is the most critical attribute of primary care quality for both overall satisfaction and recommendation, followed by doctor's interpersonal skill. Staff care and access are associated with improved overall satisfaction but not related to increasing the likelihood of recommending a clinic to relatives and friends. Doctor's technical and interpersonal skills rather than staff care and access can be the essence of quality competition in the primary care market. Providing patient education

during the visit on how to prevent or control diseases may also relate to improved patient satisfaction and recommendation (Tung & Chang, 2009).

Another study by Karim and Colleagues (2015) aimed to identifying the influence of perceived quality and satisfaction on the utilization status of the community clinic services in Bangladesh, they found that client's perception and satisfaction were significant in community clinics service utilization (Karim et al., 2015).

Service quality as described by Parasuraman, Zeithmal, and Berry (1988) is a global judgment, relating to the superiority of the service (Urban, 2013). Managing service quality is one of the most important tools an organization needs to possess in order to have a long-term satisfied customer (Cronin & Taylor, 1994). Cronin and Taylor (1992) argued that service quality has a positive influence on customer satisfaction. Service quality is, in fact, an antecedent to customer satisfaction. Many researchers came to a common consensus that its service quality and customer satisfaction, which will have a long term, impact in customer relationship (Irfan, Ijaz, & Farooq, 2012).

Using quality to describe a diverse phenomenon. Service quality is usually considerable mostly as a cognitive construct while considering satisfaction more complex concept that includes cognitive and affective components (Oliver, 1997).

The argument of taking service quality as a mere cognitive thing and having an emotional influence attached to it depends upon the service sector understudy (Kettinger & Lee, 1997).

In the past few decades, service quality became a major area of attention to practitioners, managers, and researchers owing to its strong impact on business performance, lower costs, customer satisfaction, customer loyalty, and profitability. For an organization to remain competitive in the market, it is necessary to grab and channelize information for enhancing service quality (Kettinger & Lee, 1997).

Service quality needs to be under monitor constantly in order to gain a competitive advantage. Service quality becomes even more important in sectors like healthcare where the information regarding the technical aspect of the service offered is often limited or unknown to the patient. In these circumstances, the functional aspect becomes more important because the patients evaluate the entire service based on how they get it.

**Measuring Service quality**

Service quality as mentioned by Parasuraman and Colleagues as an attitude or judgment towards a service rendered, is hard to measure because of its qualitative nature. Many authors came out with different methods and measured service quality using their own constructs (Carrillat, Carrillat, Jaramillo, & Muliki, 2007).

**Performance only model (Cronin and Taylor, 1992)**

The authors conceptualized the measurement of service quality and its relationship with customer satisfaction and future purchase intentions. The performance only measurement (SERVPERF) is due to that service quality is a form of customer attitude and performance. They maintained that performance instead of performance minus expectations determine service quality. The five factors taken for the study are:

1- Tangibility (Measured by 6 constructs)

Tangibility represents the service physically. It is defined as the appearance of physical facilities, staff appearance and communication materials that are used to provide services for them. Often firms use tangibility to highlight their image and quality.

2- Reliability (Measured by 4 constructs)

It is the ability to perform a promised service accurately on time. It generally means the company delivers on its promises regarding delivery, service provision and problem resolution.

3- Responsiveness (Measured by 6 constructs)

Being willing to help, it is the willingness or readiness to help customers and to provide prompt service. This dimension emphasizes attentiveness and promptness in dealing with customer requests, questions, complaints and problems.

4- Empathy (Measured by 5 constructs)

Treating customers as individuals defined as empathy. Caring, individual attention a firm provides to its customers.

5- Assurance (Measured by 5 constructs)

Inspiring trust and confidence defined as Assurance. The employees' knowledge and courtesy and the ability of the firm and its employees to inspire trust and confidence.

**2.2.2.7.4.3. Patient Satisfaction**

Patient satisfaction is an indicator for measuring the quality in health care, it affects clinical outcomes, patient retention, and medical malpractice claims. It influences the proper patient-centered delivery of health care. Patient satisfaction is thus a proxy but a very effective indicator to measure the success of health services (Prakash, 2010).

Patient satisfaction is the extent to which patients are happy with their healthcare, both inside and outside of the provider's office. A measure of care quality, patient satisfaction gives providers insights into various aspects of medicine, including the effectiveness of their care and their level of empathy (Heath, 2018).

A study was done by Biderman and Colleagues (2009) to find the relationship between the treatment satisfaction of DM patients and socio-demographic, clinical, adherence, treatment, and health perception factors. They found that treatment satisfaction is lower among diabetic patients who have a lower educational level, who are insulin-treated or have a DM complication and is related to difficulties in taking medications and coming to follow-up visits (Biderman et al., 2009).

Another study done by Nicolucci and Colleagues (2009), to assess health-related quality of life (HRQOL) and treatment satisfaction in a large, ambulatory based sample of patients with DM2, they found that there is an inverse relationship with female gender towards treatment satisfaction, insulin treatment, perceived frequency of hyperglycemic episodes and DM complications. Blood glucose self-monitoring, and among patients treated with insulin, self-management of insulin doses and the use of the pen for insulin injections, were associated with higher levels of satisfaction. Finally, higher levels of satisfaction were associated with a better perception of physical and psychological well-being (Nicolucci et al., 2009).

A study done by Saatci and Colleagues (2010), to assess the psychological well-being and treatment satisfaction in patients with DM2 in primary care, they found that there is a

statistically significant relation between treatment satisfaction and scholar level, glycemic control and compliance to diet and physical exercise (Saatci et al., 2010).

#### 2.2.2.8 Utilization of diabetes complication screening

Many factors prevent appropriate utilization of DM services like low socio-economic condition, knowledge, and perception towards diabetes. Utilization of DM services might also be affected by income, health literacy, depression, and competing demands, including those related to family dynamics and support are important for managing DM conditions effectively (American Diabetes Association, 2011).

Whereas DM self-management education (DSME) has been repeatedly shown to increase awareness of recommended diabetes services and is associated with receiving higher levels of comprehensive clinical care (Steinsbekk et al., 2012; Duncan et al., 2011). A study by Johnson and others (2015) revealed a positive relationship between DSME duration and utilization of some DM clinical care services (Johnson et al., 2015).

There are different results of DM complications screening percentage and mainly depends on the site of research, for example, according to Han and Colleagues (2016), in Korea 37.1% of study participants had been screened for DM retinopathy or DM nephropathy (Han et al., 2016). But according to Perera and Colleagues (2015), in Sri Lanka, Annual retinopathy screening was performed in only 61% of patients, while nephropathy and neuropathy screening was offered to 43% and 32% respectively (Perera et al., 2015).

In the USA, the age-adjusted percentage of adults aged 18 years or older with diagnosed DM receiving a dilated eye exam in the last year was 57.0% in 1994 and 62.8% in 2010 (CDC,2018). Moreover, from 1994 to 2010, the age-adjusted percentage of adults aged 18 years or older with diagnosed DM receiving a foot exam in the last year increased by 19.4 points, from 48.1% to 67.5% (CDC, 2018).

# Chapter 3

## Methodology

This chapter describes the methodology used to conduct this study; it includes the study design, study settings, study population, study sample, data collection process, data cleaning and analysis, and ethical considerations. Also its offers an explanation of the instruments of data collection that were used to collect data, finally, this chapter is concluded by the limitations of this study and the ethical considerations.

### 3.1 Study Design

The design of this study is a descriptive cross-sectional design. It is a mixed one that includes both qualitative and quantitative data collection approaches. The cross-sectional design is appropriate for the description of the practice and its relation to other variables. The qualitative data was collected through focus groups. Focus groups are one of the research techniques that collect data through interaction on a topic of interest by a researcher (Morgan, 1996). An important theme that reappears in many of these focus groups is their ability to "give voice" to study participants . The value of focus groups goes well beyond listening to others, it can serve as a basis for empowering clients (Morgan, 1996). In mixed method studies, researchers purposefully triangulate the quantitative and qualitative data rather than separate them. Triangulates ensure collecting rich data, validating research findings, and to interpreting the findings . Such designs also raise a complex set of issues, since the two methods produce different kinds of data, because, if the surveys inherently limited by the questions they ask, focus groups will provide data on how the respondents themselves think of the survey topic(Morgan, 1996).

### 3.2 Study Settings

The study was conducted in six UNRWA health care centers that provide health services to diabetic clients. Out of the 22 UNRWA health centers operate in the GS, six health centers were selected through Simple Random technique. The six health centers (Jabalia, Sheikh Radwan, Dier Alballah, Maen, Al Naser and Rafah) are distributed across the GS, one center in each governorate, except two centers are located in Khanyounis governorate. It is important to note that the six centers vary in their size, ranging from relatively small center (Al Naser) to considerably large ones (Jabalia and Rafah). Such diversity in terms of location

and size of health centers ensures high diversity of sample size and a more representations of the study sample

## 3.3 Duration of the study

The study has started after having the university approved the proposal, and after obtaining the ethical approval from the Helsinki committee in August 2017, as shown in **Annex (1)**. The study started in April 2018 due to the delayed in obtaining approval from UNRWA to conduct the study on its premises. A pilot study was conducted in April 2018, then data collection was completed in May 2018. Data entry and cleaning were conducted in June 2018. Coding and analysis of data were conducted in July 2018. The study final report was completed in April 2019. **Annex (2)** describes the study steps and the duration of each activity.

## 3.4 Study Population and Sample Size

### 3.4.1 Quantitative part

Regarding the quantitative part, the study population consisted of DM2 clients that are registered at UNRWA health centers in the GS. In 2016, there were 39448 DM2 patients, who utilize health services at the 22 UNRWA health centers as in **Annex (3).** The sample size calculated to be 381 and it was increased to 408 clients to compensate non-respondent, as in **Annex (4).** The researcher used the following parameters for a sample calculation: maximum acceptable percentage points for error 5%; confidence level 95% and total Population (39448).

### 3.4.2 Qualitative part

Regarding the qualitative study, a non- probability purposive sample, from the 6 health centers, a total of 15 physicians and 15 nurses who work with DM2 patients were invited to participate in the focus group discussions. In total, 4 focus group discussions were held. The selection of participants was done purposefully in order to collect rich data and to have diversity in views. Participants were of different age groups, from different clinics, and mixed of females and males.

### 3.4.3 Abstraction sheet

The data about the contact time and waiting time were collected by using abstraction sheet from 90 DM2 clients, 15 DM2 clients from each health center. The selection of this sample was done using Simple Random Sample. The first 15 DM2 clients entered the health center for DM2 health services were selected. Each DM2 client was followed from the moment s/he entered the health center until s/he left it. The contact time was measured for nursing and physician stations for every client and the waiting time was measured for all health center stations (nursing, physician, laboratory, pharmacy), finally, the total time consumed by DM2 clients in the health center was calculated.

## 3.5 Eligibility Criteria—quantitative part

### 3.5.1 Inclusion

- DM2 clients, who have been utilizing DM2 health care services for at least 1 year.

### 3.5.2 Exclusion

- DM1, visiting the health centers to receive other health care services
- DM2, who have been utilized diabetes health care services for less than 1 year.

## 3.6 Eligibility Criteria—qualitative part

### 3.6.1 Inclusion

- The DM2 health care providers include physicians, nurses, working in study locations.

### 3.6.2 Exclusion

- Other health care providers who are not working directly with DM2 clients like midwives, senior staff nurses, and senior medical officers

## 3.7 Instruments/tools: Quantitative study

**Questionnaire**

The quantitative data were collected through a well-structured questionnaire, with most questions being close-ended questions. The questionnaire was designed with reference from

those concepts mentioned in the conceptual framework. The following items were involved in the questionnaire:

- Socio-demographic and economic characteristic of diabetic clients.
- Health education provided to diabetic clients.
- Quality of the provided services
- Clients satisfaction with the provided services
- Screening services offered at UNRWA health centers.
- Follow up activities and tests done for diabetic clients.

**Pilot Study**

To assess the appropriateness of the questionnaire, a pilot study for 28 patients was carried out. The researcher has modified the questionnaire based on the outcomes of the pilot study. As no major modifications were introduced after the pilot, data collected through the pilot study were included in the study sample.

## 3.8 Instruments/tools: Qualitative study

**Focus group**

To fulfill the requirements of the study and to triangulate the quantitative data, 4 focus groups discussions with 30 health providers were carried out. On average, each focus group had 8 participants. The qualitative approach was used to gather, review, and understand the data. Guiding questions were developed. The guiding questions covered different issues such as the current practices, barriers to utilization of diabetic screening services, and ways to improve the diabetic services at UNRWA health centers **(Annex 5).**

## 3.9 Scientific rigor: quantitative part

### 3.9.1 Reliability

To help in collecting the data, the researcher hired an assistant. The assistant was trained by the researcher to ensure collecting reliable data, and the assistant was trained on how to select the participants, how to ask questions, and how to fill the questionnaires. The researcher used to check and review each questionnaire that was completed by the assistant day by day. The researcher re-entered 5% of the collected data. 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 3.1)**.

**Table (3.1): Cronbach alpha coefficient for perceived quality and satisfaction domains**

| Items | No. of items | Cronbach's alpha |
|---|---|---|
| Perceived Quality and satisfaction domains | 37 | 0.914 |

### 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 wording, and to allow smooth data collection and easy data entry; The questionnaire was structured in an organized way. During the validation process, the questionnaire layout was reviewed and reformed several times until the final version of the questionnaire looked suitable.

**Content validity**

It addresses the development of the items that can be operated to provide an adequate and representative sample of all items that might measure the construct of interest (Kimberlin & Wintersten, 2008). There is no statistical test to determine and cover the content area. Content validity usually depends on the judgment of experts in the field so, the questionnaire was evaluated by a group of eleven experts with different backgrounds **(Annex 6).** The evaluation purpose was to assess the relevance of each domain, to check if the content of the questionnaire is appropriate to its intended purpose and achieve the overall goal. Additionally, the researcher considers all experts feedback and comments, so the final version developed, and the interview questions matched all experts' feedback. Finally, the research assistant was trained well to ensure the accuracy of data collection.

## 3.10 Scientific rigor: qualitative part

**Trustworthiness**

Trustworthiness is the analog concept to reliability and validity of the qualitative data. It contains four aspects: credibility, transferability, dependability, and conformability (Guba, 1981). To ensure trustworthiness of the qualitative data the researcher implemented the following actions:

1. Congruence between the research questions, objectives and methods of data collection was ensured by the researcher.
2. Data collection tools were developed by the researcher.
3. The researcher has did a peer review of the tools.
4. Selected participants in the focus group discussions were informed that their participation is voluntary, and confidential.
5. The interviews were recorded and then the data was transcript by the researcher.
6. The qualitative data was immediately analyzed after termination of the collection in every focus group.
7. Independent coding of the qualitative data was used to ensure integrity in data analysis.

## 3.11 Data Collection

Data were collected by the researcher and his assistant, and it took almost two months to collect all the data. At the same time, the assistant was trained on how to select the sample and how to ask the questions. The researcher conducted all focus groups discussions.

## 3.12 Data entry and data analysis

### 3.12.1 Quantitative part

The researcher has used the Statistical Package for Social Sciences (SPSS) program version 22 for quantitative data entry and data analysis, and the researcher followed different steps.

- Data entry was conducted immediately after collecting the data.
- Study variable was coded and entered into SPSS by the Statistician.
- Data cleaning was conducted after finishing the data entry.
- Frequency distribution of all variables was done.

Cross-tabulation for the main finding and bi-variate statistical tests such as Chi-square test was used, and correlation and t-tests, or one-way ANOVA to investigate the relationships between the different variables and the different relationship between them.

### 3.12.2 Qualitative part

Through the focus group, the researcher used the open coding thematic analysis, and took notes during and after each focus group, then developed a data entry model that involves data cleaning, categorization, and coding. Coding is an interpretative technique in a quantitative method. Most coding needs to be demarcated via themes. Each theme is labeled with a code. After completion of coding, the researcher prepared a summary of relationships between the codes. The quantitative and qualitative findings were then compared and integrated to validate the findings and create rich information.

## 3.13 Ethical and managerial consideration

- Administrative approval was obtained from Al Quds University.
- Ethical approval was received from Helsinki Committee, as in **Annex (7).**
- Administrative approval was obtained from the UNRWA Research Committee.
- Informed consent for patients was developed to ensure confidentiality. The purpose of the study was explained to the participants and they were aware about voluntary and confidentiality of participation **(Annex 8)**.
- Participants of focus group discussions were asked for their permission to record focus groups interviews.

## 3.14 Limitation of the study

- Limited resources including funds and facilities for data collection and data entry.
- Time limitations.
- Limited literature resources, such as books and journals.
- Limited working hours at UNRWA health centers.
- Frequent power shortage.

# Chapter Four

## Findings and Discussion

### 4.1 Introduction

This chapter presents the main findings of the quantitative and qualitative data. It begins with a descriptive analysis of the study participants demographic characteristics. Then, it highlights the main inferential analysis of selected variables. The inferential analysis focuses on examining the relationship between selected variables and other selected covariates. Additionally, findings of abstraction sheet will be outlined and discussed. Throughout this Chapter, qualitative and quantitative findings will be discussed in light of previous research studies. Findings and discussion will be presented as in the conceptual framework: clients' factors, health providers' factors, and healthcare system factors.

### 4.2 Client factors

#### 4.2.1 Demographic characteristics of study participants

As shown in figure (4.1), 26.2% of the study participants were from North Gaza governorate; 11.8% of the study participants were from Gaza governorate; 19.6% of the study participants were from Dier Alballah governorate; 18.9% of the study participants were from Khanyounis governorate. Finally, 23.5% of the study participants were from Rafah governorate.

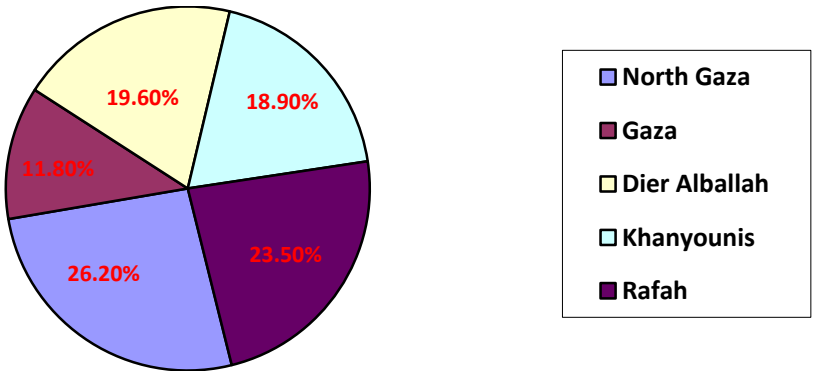


**Figure (4.1): Distribution of study participants according to governorates**

Table (4.1) showed that the mean age of the study participants, in general, was 56.36 years with (SD 10.6). Breakdown of study participants by age groups shows that 25% of

participants aged less than 50 years, 40.9% aged between50 to60 years, and 34.1% aged 61 years and more. This finding was consistent with UNRWA field disease control report which showed that 26% of diabetic patients were more than 60 years (Saleh, 2018).

With regard to gender, about two-thirds (63.5%) of the study participants were females and about one third were males (36.5%). This was consistent with the findings of an annual health report (2018), in which male clients constitute 39% of all diabetic patients utilizing UNRWA's health services (UNRWA, 2018).

More than two-thirds of the study participants were married at the time of data collection (84.1%) and only 15.9% of the study participants were unmarried during the time of data collection, including being widow, single, or divorced.

With regard to years of schooling, 58.4 % of study participants had less than 12 years of schooling, and 41.6 % of study participants had 12 years of schooling or more. This finding is consistent with the findings of AL-Qedra (2018) who found that 40.1% of diabetics' type 2 in UNRWA clinics had at least 12 years of schooling (AL-Qedra, 2018).

**Table (4.1): Distribution of the study participants according to their demographic characteristics**

| **Items** | **No.** | **%** |
|---|---|---|
| **Age groups** | | |
| Less than 50 years | 102 | 25.0 |
| From 50 to 60 years | 167 | 40.9 |
| 61 years and more | 139 | 34.1 |
| **Total** | **408** | **100.0** |
| **Mean= 56.36 years, SD= 10.6** | | |
| **Gender** | | |
| Male | 149 | 36.5 |
| Female | 259 | 63.5 |
| **Total** | **408** | **100.0** |
| **Marital Status** | | |
| Married | 343 | 84.1 |
| Unmarried | 65 | 15.9 |
| **Total** | **408** | **100.0** |
| **Years of schooling** | | |
| Less than 12 Years | 238 | 58.4 |
| 12 Years and Above | 170 | 41.6 |
| **Total** | **408** | **100.0** |
| **Mean= 9.79 years, SD= 4.1** | | |

As shown in figure (4.2), more than two-thirds of the study participants were unemployed at the time of data collection (73.5%), only 17.2% were employed, finally, less than 10% of the study participants were retired. The breakdown of employment status by gender shows that 34.9% of men were employed at the time of data collection compared to 6.9% of females. On the other hand, about half of male study participants (46.3%) were unemployed compared to 89.2% of unemployed women.

That is consistent with the findings of the PCBS as the current unemployment rate is about 78% among females in the Gaza Strip (PCBS, 2017). This also reflects that the low participation rate of women in the labor market (19%) in Palestine, as reported by the PCBS (PCBS, 2018c).

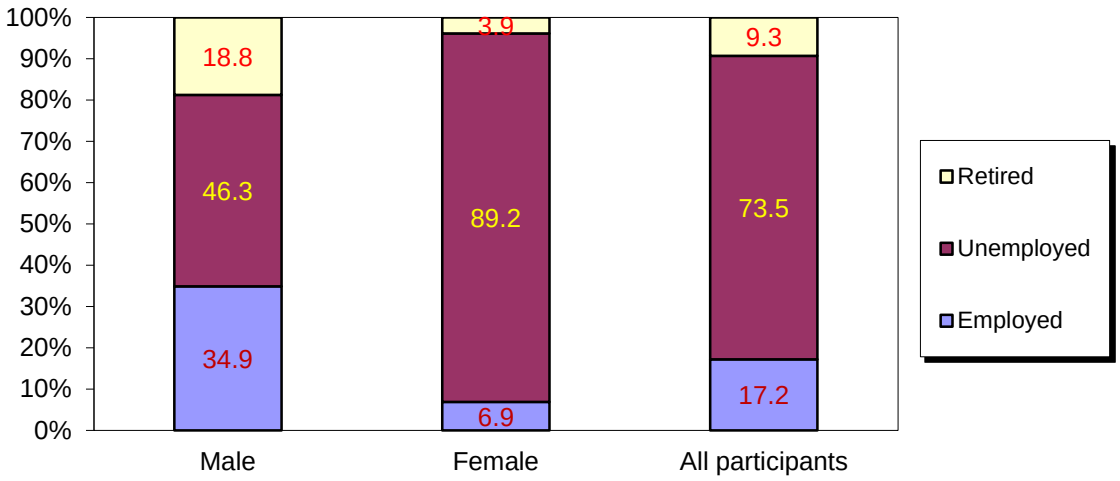


**Figure (4.2): Distribution of the study participants according to their employment status**

The findings have revealed that the mean monthly income was 1105.82 New Israeli Shekels (NIS), with SD (1303.85). In 2017, the poverty line and deep poverty line for a reference household of five individuals (2 adults and 3 children) were 2,470 NIS and 1,974 NIS, respectively (PCBS, 2017). As shown by figure (4.3), it is noticeable that only 11.3% of the study participants have average monthly income above the poverty line, on contrary, 88.7% of the study participants have a monthly income that is either under the deep poverty line or under the poverty line. These results are inconsistent with the findings of PCBS (2017), in which 53% of individuals in the GS live under the poverty line (PCBS, 2017). The study result reflects the overall deterioration of Gaza's economy. Such high

poverty rates could jeopardize clients' ability to afford meeting basic life necessitates and medical treatment.

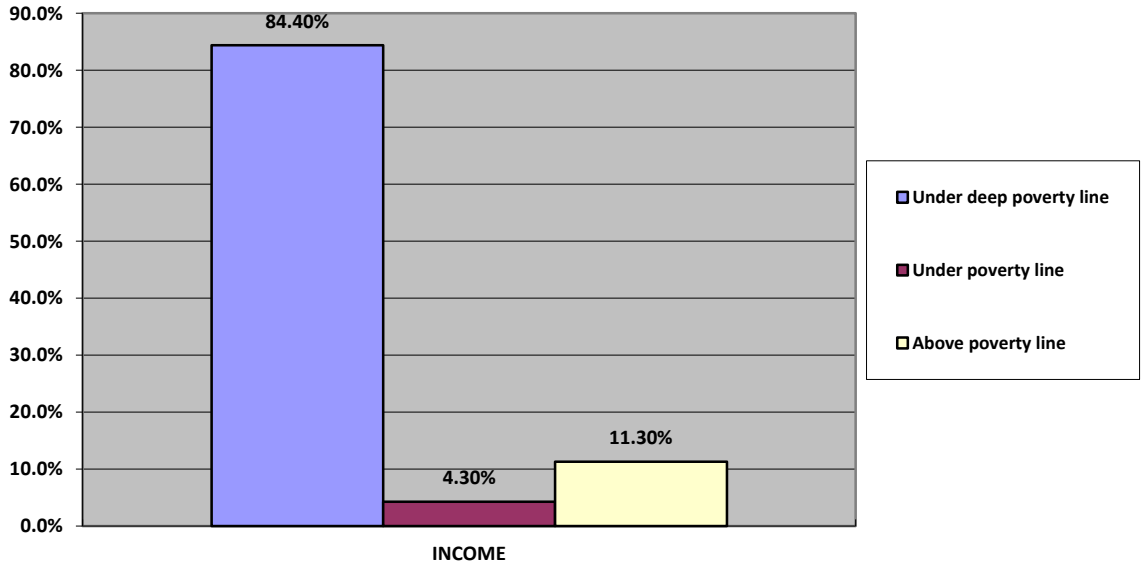


**Figure (4.3): Distribution of participants according to their income Smoking**

As shown by figure (4.4), only 11.3% of the study participants were smokers at the time of data collection; the mean number of smoked cigarettes was 15.52, with (SD 12.2). The breakdown of smoking status by gender shows that 30.2% of males were smokers and only 0.4% of females were smokers at the time of data collection. This is consistent with the WHO Report on the Global Tobacco Epidemic (2015), in which 37.6% of men adults were tobacco smokers (WHO, 2015). These findings are also consistent with Eldalo (2016) who found that the prevalence of smoking is 26.3%, with a significantly higher rate among males (31%) compared to females (6.9%) (Eldalo, 2016).

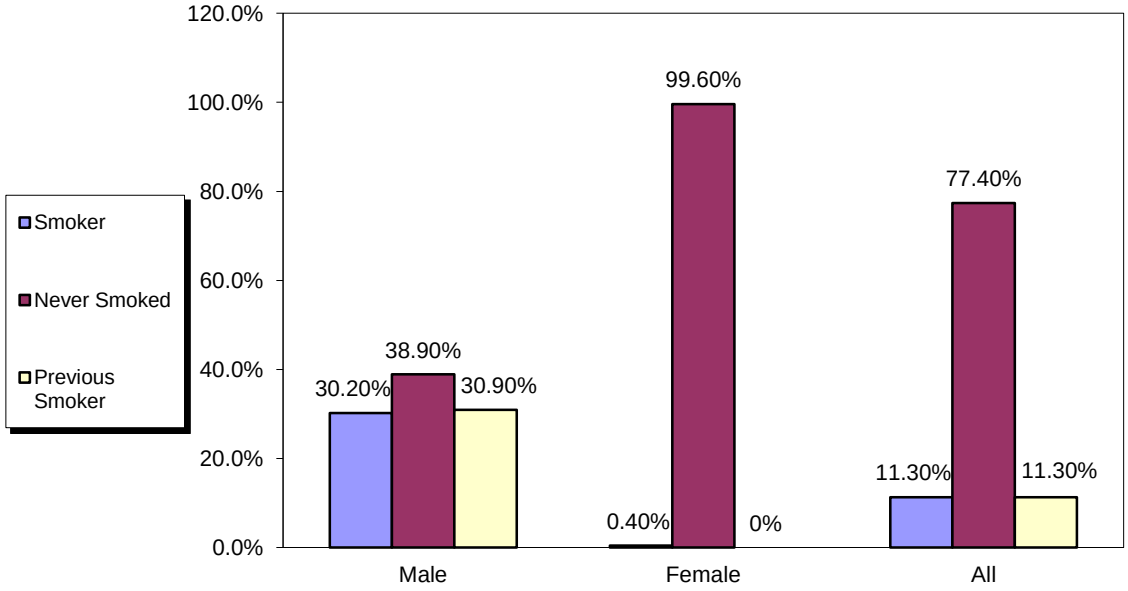


**Figure (4.4): Distribution of the study participants according to smoking status**

### 4.2.2 Distribution of the study participants according to their medical history

**Reasons for today's visit**

About two third of the study participants (69.9%), indicated that the main reason of their visit to health center was for refilling their drugs prescriptions, followed by performing laboratory tests with 42.6% of study participants, and only 20.6% of study participants mentioned that the main reason for their visit was to conduct regular follow up. These results could be explained by the affordability of UNRWA's services like medicine, laboratory tests are provided free of charge. It might also reflect a gap in client's understanding of the importance of conducting regular fellow up.

**Duration of disease**

As shown in Table (4.2), the mean duration of been diagnosed with DM was 8.88 years with SD (6.90), in which 26% of study participants had 3 years or less of diabetes, 41.4% of study participants had DM from 4 to 10 years, and 32.6% of study participants had DM2 for more than 10 years . These results were consistent with AL-Qedra (2018) study results which revealed that the mean DM duration was 8.45 years (AL-Qedra, 2018).

**Receiving services from other service providers**

The majority of the study participants (95.1%) utilize services only from UNRWA health centers. On the contrary, less than 5% of the study participants utilize health services from other service providers along with UNRWA health services. With regard to the other service providers, as shown in the Table (4.2), participants utilize services mainly from private providers (60%), followed by governmental health centers and non-governmental centers, with 20%, each.

The main causes of receiving services from other service providers in addition to UNRWA's one were: (1) availability of specialized services as indicated by 55% of study participants, (2) avoiding long waiting time as indicated by 15 % of study participants, (3) more convenient working hours as indicated by 15% of the study participants,(4) physical proximity to home as indicated by 10% of study participants and finally, (5) trustful relationship with provider as indicated by 5% of study participants.

**Co-morbidities**

Table (4.2) show that 72.1% of the study participants have co-morbidities along with diabetes type 2. As expected, the most frequent comorbidities were high blood pressure (67.2% of total study participants), and heart disease (14.2% of total study participants). This result is closed to UNRWA annual health report (2018), in which approximately 67.3% of patients were a double burden, having both diabetic and hypertensive (UNRWA, 2018). According to Long & Dagogo-Jack (2011), Approximately 75% of adults with DM also have hypertension, and patients with hypertension alone often have evidence of insulin resistance. Thus, hypertension and DM share a significant similarity in underlying risk factors (including ethnicity, familial, dyslipidemia, and lifestyle determinants) and complications ( Long & Dagogo-Jack, 2011).

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

| Items | No. | % |
|---|---|---|
| **What are the reasons for today's visit** | | |
| Scheduled appointed-follow up | 84 | 20.6 |
| Walk-ins- visit | 9 | 2.2 |
| To do laboratory tests | 174 | 42.6 |
| Refilling a prescription | 285 | 69.9 |
| Others | 6 | 1.5 |
| **Years since being diagnosed by DM type 2** | | |
| 3 Years and less | 106 | 26.0 |
| From 4 to 10 Years | 169 | 41.4 |
| More than 10 Years | 133 | 32.6 |
| **Total** | **408** | **100.0** |
| **Mean = 8.88, Std= 6.90** | | |
| **Receiving health services from other providers along with UNRWA** | | |
| Yes | 20 | 4.9 |
| No | 388 | 95.1 |
| **Total** | **408** | **100.0** |
| **Other service providers** | | |
| Governmental center | 4 | 20.0 |
| Non-governmental organization center | 4 | 20.0 |
| Private center | 12 | 60.0 |
| **Total** | **20** | **100.0** |
| **Reasons for receiving services from such providers** | | |
| Availability of specialized services | 11 | 55.0 |
| More convenient working hours | 3 | 15.0 |
| Avoid waiting time | 3 | 15.0 |
| Trustful provider | 1 | 5.0 |
| Physical proximity to home | 2 | 10.0 |
| **Total** | **20** | **100.0** |
| **Have other chronic diseases- co-morbidities** | | |
| Yes | 294 | 72.1 |
| No | 114 | 27.9 |
| **Total** | **408** | **100.0** |
| **Co-morbidities( as a percentage from total participants, the participant may have one or more)** | | |
| High blood pressure | 274 | 67.2 |
| Kidney disease | 6 | 1.5 |
| Heart disease | 58 | 14.2 |
| Chronic Obstructive Pulmonary Diseases | 20 | 4.9 |

### 4.2.3 Distribution of the study participants according to their knowledge about diabetes and the practice of diabetes self-care

**Participants' knowledge**

As shown in Table (4.3), the mean of correct answers was only 76.87 % with (SD 12.6). This may reflect a good level of knowledge about DM by study participants, especially compared to many studies which have reported that knowledge about DM is generally poor among diabetic patients in both the developed and developing countries (Al-Maskari et al. 2013; Deepa et al. 2014), but its remarkable that some questions show a great deficit in the DM knowledge.

Sadly, 88.7% of study participants did wrongly answer the question on diabetes diet, 76.5% of study participants did wrongly answer the question on the mode of transmission of DM, more than half of study participants (52%) did wrongly answer the question on signs of hyperglycemia , 21.8% of study participants did wrongly answer the question on the best way to check blood sugar level, 21.3% of study participants did wrongly answer the question on signs of hypoglycemia, and 14.7% of study participants did wrongly answer the question on foot self-care management.

To sum up, the main areas of knowledge deficit among diabetic clients are clients' knowledge on symptoms and signs of hyperglycemia and hypoglycemia, and clients' knowledge on self-care management, including diet, foot care, and follow up.

These two areas have an immense impact on the outcome of diabetes management, as they positively correlated with good glycemic control, prevention of complications and improvement in the quality of life (ADA, 2009; Povey, 2007; Odegard, 2007).

**Table (4.3): Distribution of the study participants according to their level of knowledge on DM**

| Items | Wrong Answers | | Correct answers | |
|---|---|---|---|---|
| | No. | % | No. | % |
| If untreated, type 2 DM the blood sugar usually increases | 15 | 3.7 | 393 | 96.3 |
| The diabetic patient will transfer DM to his/her children | 312 | 76.5 | 96 | 23.5 |
| A fasting blood sugar level of 210 is too high | 16 | 3.9 | 392 | 96.1 |
| The best way to check your blood glucose is by testing urine | 89 | 21.8 | 319 | 78.2 |
| Regular exercise will increase the need for insulin or other diabetic controlling drugs | 40 | 9.8 | 368 | 90.2 |
| Medication is more important than diet and exercise to control blood glucose level | 44 | 10.8 | 364 | 89.2 |
| Cuts and would heal more slowly among diabetic clients | 17 | 4.2 | 391 | 95.8 |
| Diabetic clients should be very careful when cutting their toenails | 13 | 3.2 | 395 | 96.8 |
| Uncontrolled type 2 DM can cause renal impairment | 29 | 7.1 | 379 | 92.9 |
| Uncontrolled type 2 DM can cause loss of sensations (hands, fingers, and feet) | 27 | 6.6 | 381 | 93.4 |
| Shaking and sweating are signs of high blood sugar level | 212 | 52.0 | 196 | 48.0 |
| Frequent urination and thirst are signs of low blood sugar level | 87 | 21.3 | 321 | 78.7 |
| Tight elastic shoes or socks are appropriate for type 2 DM | 60 | 14.7 | 348 | 85.3 |
| A diabetic diet consists mostly of special foods | 362 | 88.7 | 46 | 11.3 |
| **Mean: 76.87, SD = 12.6** | | | | |

**Participants practice of diabetic self-care**

With regard to exercise, as shown in Table (4.4), 24.3% of study participants have been regularly exercising for more than 6 months, 6.6% of study participants regularly exercise but for less than 6 months, 35.8% of study participants currently exercise but not regularly, 10% of study participants did not exercise but have the intention to do that in the next 6 months, finally, 23.3% of study participants did not exercise and also they do not have the intention to exercise.

Regardless of weight control, participating in regular physical activity has been found to improve the health status outcomes among diabetics (ADA, 2011; Colberg, 2010). National Institutes of Health (2008) and the American College of Sports Medicine (2007) did recommend that all adults, including those with DM, should participate in regular physical activity at least 30 minutes on five days each week (NIH, 2008; Haskell, 2007).

As the study findings revealed that only 30.9% of study participants regularly exercise. This reflects a gap between knowledge and practice, this gap could be explained by knowledge deficit about the importance of exercise, limited availability of appropriate facilities for exercise, limited affordability to pay for gymnastics, and maybe cultural constraints.

Concerning weight, as shown in Table (4.4), 21.6% of participants did not do any things in particular to control their weight, 61% of study participants try to lose weight, 15.7 % of study participants try to avoid gaining weight, and only 1.7% of study participants try to gain weight. According to Williamson (2009), overweight adults DM2 experienced important improvement in health-related quality of life (HRQOL) by joining a weight management program (Williamson, 2009). Also according to Lau (2010), a modest weight loss of 5–10% is associated with an important decrease in blood sugar, lipid, and blood pressure levels (Lau, 2010).

As shown in Table (4.4), 90% of study participants take their medication regularly and on time, on the contrary, 5.6% of study participants did report not taking their medication regularly. Compared to diet and exercise the percentage of a patient adherent to treatment is high, which may reflect the patient view of self-care, but more health education about the importance of being adherent to treatment is needed, as the 10% of not taking the drug

regularly is still high. According to Cramer and Colleagues (2007), non-adherence with cardiovascular and antidiabetic medication is a significant issue, with approximately 30% of duration 'on therapy' not covered by medication and only 59% of patients fully covered by medication for more than 80% of their 'on therapy' duration in a year (Cramer et al., 2007).

**Table (4.4): Distribution of the study participants according to their practice of diabetic self-care**

| Items | No. | % |
|---|---|---|
| **Exercise** | | |
| I currently don't exercise and don't intend to start a regular exercise in the next 6 months | 95 | 23.3 |
| I currently don't exercise but I intend to start a regular exercise in the next 6 months | 41 | 10.0 |
| I currently exercise but not regularly | 146 | 35.8 |
| In the last 6 months, I started to exercise regularly | 27 | 6.6 |
| I currently exercise regularly and I have done so far longer than 6 months | 99 | 24.3 |
| **Total** | **408** | **100.0** |
| **Weight** | | |
| I am actively doing things to try to gain weight at the moment | 7 | 1.7 |
| I am actively doing things to try to avoid gaining weight at the moment | 64 | 15.7 |
| I am actively doing things to try to lose weight at the moment | 249 | 61.0 |
| I am not doing ay things in particular for my weight at the moment | 88 | 21.6 |
| **Total** | **408** | **100.0** |
| **Treatment adherence** | | |
| I take all my medication regularly and on time | 367 | 90.0 |
| I take all my medication regularly but sometimes I forget to take it | 18 | 4.4 |
| I don't take my medication regularly | 23 | 5.6 |
| **Total** | **408** | **100.0** |

## 4.3 Health care system factors

### 4.3.1 Accessibility of diabetes health services

**Physical accessibility of diabetes health services**

As shown in Table (4.5), 89.5% of study participants indicated that it was easy to access the health center to utilize the available services to diabetic clients. On the other hand, 10.5% of the study participants have expressed that it was not easy to access the health center to receive diabetes health services. The most frequent causes, as reported by study participants who expressed that access as was not easy, were the transportation cost as expressed by 67.4% of study participants, followed by long walking distance as expressed by 25.6% of study participants.

The findings of this study were consistent with Syed and Colleagues (2013), in which transportation cost is a recognized as a barrier to utilization of health care services (Syed et al., 2013).

According to the Health Research & Educational Trust (2017), transportation barriers can affect a person's access to health care services. These barriers may result in missed or delayed health care appointments, increased health expenditures, and overall poorer health outcomes (Health Research & Educational Trust, 2017).

The high poverty rates and the deteriorating economic conditions in the GS are negatively affecting the access to health care services in which 10% of the study participants mentioned transportation cost as a barrier to utilize health services. In general, public transportation cost is the GS is low, less than one USD. This finding was consistent with the findings of the focus group discussions in which health providers identified transportation cost as a barrier to utilize health services.

However, the high percentage (89.5%) of participants who indicated very good physical accessibility and financial affordability reflect the affordability and accessibility of UNRWA health services.

**Accessibility of diabetes health services by persons with disabilities**

Approximately half of the study participants feel that health center is not adapted for people with disabilities. It is well-known that diabetics might suffer from different disabilities due to lower limbs amputations (Joslin, 2018), post-stroke physical impairments, and impaired in visual acuity. Thus, all health centers should be adapted for people with disabilities.

**Time accessibility of diabetes health services**

As shown in the Table (4.5), from the study participants' point of view, the mean waiting time to receive nursing services was 24.98 minutes with SD (14.23), 53.9% of study participants did wait less than 30 minutes and 46.1% of study participants did wait 30 minutes or more.

Also, the mean waiting time to receive diabetes health services from a family doctor was 22.68 minutes with SD (19.93), 63.8% of study participants did wait less than 30 minutes and 36.2% of study participants did wait 30 minutes or more.

The mean time generally takes participants to receive all services from entry to the health center to exit the center, was 89.52 minutes with SD (46.58). In total, 53% of study participants spent less than 90 minutes, and 47% of the study participants spent more than 90 minutes.

The abstract sheet illustrates that the majority of spent time was waiting to receive DM2 services from health providers. Only, 8 minutes spent as a contact time with health providers, it was 4 minutes for nurses and 4 minutes as well for physicians. Despite that, 62.3% of the study participants did perceive the waiting time as reasonable and only 37.5% of study participants thought that waiting time is lengthy. Adams & Carter (2011), studied the knowledge, attitudes and practices, and the barriers faced by people with DM and hypertension in Barbados, and found that health care system factors affect the amount of time spent accessing care because of long waiting times weakens the quality of provided care (Adams & Carter, 2011). Also according to Prentice and Colleagues (2011), who studied the outpatient wait time and DM care quality improvement, and found that decreasing wait times may reduce A1C levels by 0.18 % for patients with baseline A1C levels over 8% (Prentice et al., 2011).

**Table (4.5): Distribution of the study participants according to their Perceived Accessibility**

| Items | No. | % |
|---|---|---|
| **Ease of reaching the health center** | | |
| Yes | 365 | 89.5 |
| No | 43 | 10.5 |
| **Total** | **408** | **100.0** |
| **Barriers to physical accessibility** | | |
| Come on foot and its take a long time | 11 | 25.6 |
| I come by public transportation and it is cost money | 29 | 67.4 |
| Both | 3 | 7.0 |
| **Total** | **43** | **100.0** |
| **Health center adapted for people with disabilities** | | |
| Yes | 203 | 49.8 |
| No | 205 | 50.2 |
| **Total** | **408** | **100.0** |
| **Waiting time to receive diabetes services from nurses** | | |
| Less than 30 minutes | 220 | 53.9 |
| 30 minutes and more | 188 | 46.1 |
| **Total** | **408** | **100.0** |
| **Mean = 24.98, SD= 14.23** | | |
| **Waiting time to receive diabetes services from a family doctor** | | |
| Less than 30 minutes | 160 | 63.8 |
| 30 minutes and more | 148 | 36.2 |
| **Total** | **408** | **100.0** |
| **Mean = 22.68, SD= 19.93** | | |
| **Total time spent to receive health services** | | |
| Less than 60 minutes | 53 | 13.0 |
| From 60 to 89 minutes | 163 | 40.0 |
| From 90 to 120 minutes | 152 | 37.3 |
| More than 120 minutes | 40 | 9.8 |
| **Total** | **408** | **100.0** |
| **Mean = 89.52, SD= 46.58** | | |
| **Perception about time consumed** | | |
| Reasonable | 254 | 62.3 |
| Lengthy | 153 | 37.5 |
| Short | 1 | 0.2 |
| **Total** | **408** | **100.0** |
| **Availability of diabetic health services** | | |
| Yes | 401 | 98.3 |
| No | 2 | .5 |
| Sometimes | 5 | 1.2 |
| **Total** | **408** | **100.0** |
| **Received services met clients expectation** | | |
| Yes | 391 | 95.8 |
| No | 17 | 4.2 |
| **Total** | 408 | 100.0 |

**Availability of diabetes health services**

The vast majority of the study participants (98.3%) reported that diabetes health services are always available at UNRWA health centers. On the contrary, only 1.7% have mentioned that health services available either sometimes or not at all. Also, 95.8% of the study participants feel that diabetic services met their expectations, and only 4.2% of study participants indicated that services did not meet their expectations.

The most frequent barriers to receiving diabetes health services in UNRWA health center were long waiting time as indicated by 77.4% of the study participants, followed by over crowdedness of health center as reported by 40.2% of the study participants, as shown in figure (4.5). This is inconsistent with previous results in which 62.3% of study participants did perceive the spent time to receive diabetes health services as reasonable, it's maybe a kind of courtesy by study participants.

According to Bleusteino (2014) study, every aspect of patient experience-mainly trust in the care provider and perceived quality of care-correlated negatively with longer wait times (Bleusteino, 2014). It is recommended that UNRWA shorten the waiting time of diabetic patients through enforcing the appointment system and recruiting additional staff, if possible.

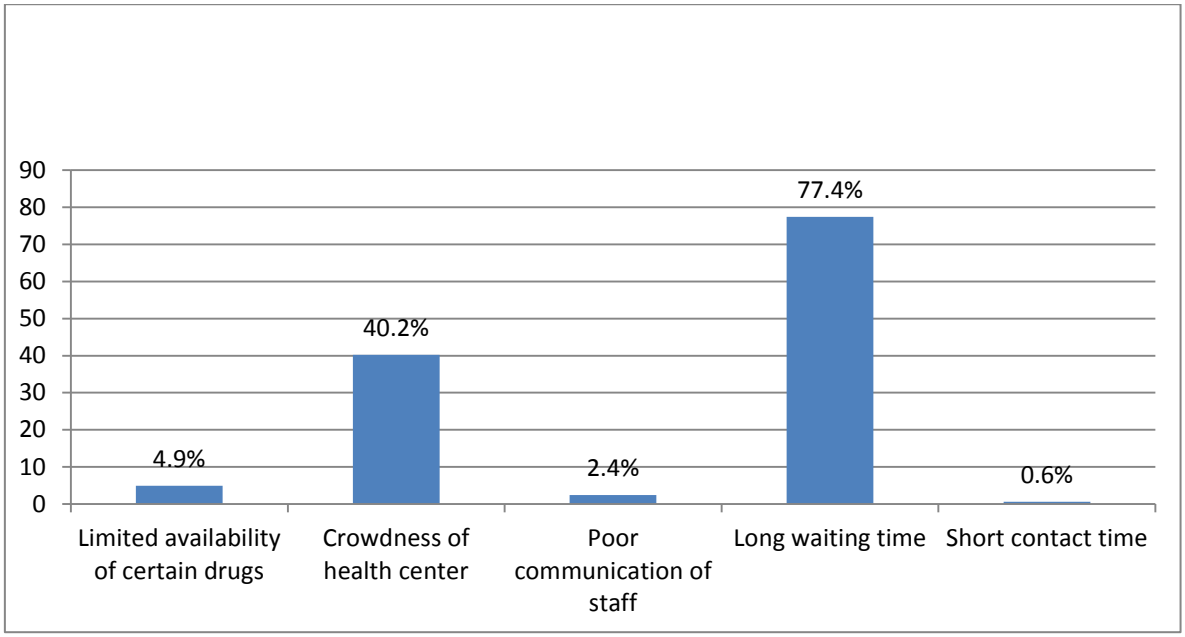


**Figure (4.5): Barriers to diabetic service utilization**

### 4.3.2 Existence of Technical Instructions (TI)

All participants of focus group discussions have stated that they have soft copies of protocols and expressed their interest in periodical refresher training on TI. Also, they stressed the importance of having all new additions to TI in one file that is easy to access. The majority of participants of focus group discussions did express interest in updating the TI, especially by adding postprandial glucose test to existing fasting glucose test and to increase the frequency of testing HbA1C to be 3 times per year for uncontrolled patients, instead of once per year.

The existence of TI in UNRWA health program and the strict compliance of staff to it is the main difference between UNRWA and other health providers for diabetics patients. Technical instructions organize the work precisely and in discipline way according to WHO standards. The protocols are issued and used by UNRWA to make the actions of its staff members are predictable, and presumably of higher quality (UNRWA, 2011b).

According to a systemic review done by Lugtenberg and Colleagues (2009) to evaluate the effects of evidence-based clinical practice guidelines on quality of care, and found that evidence-based clinical guidelines can be effective in improving the process and structure of care (Lugtenberg et al., 2009).

### 4.3.3 Appointment system

The focus groups interviews revealed that there is a wide variation between nurses and doctors in relation to the effectiveness of an appointment system, for example, a 32 years old nurse participant stated" *It's very good, approximately 80% effective*", but on the other hand, a 36 years old doctor participant expressed " *It's not good, all patients come on peak time from 9 to 11 am, to do FPG early morning and then they rash to doctors*". Other 40 years nurse participant revealed that appointment system was good but now it's deteriorating due to the difficult financial situation in the Gaza Strip, he stated:" *Due to the hard financial situation, patients come on feet, so they can't come on time and date*".

Other causes of ineffective appointment system as expressed by different interviewed participants are the recurrent rotation of staff and high workload.

A systemic review by Nuti and Colleagues (2015) aimed to assess the impact of interventions on appointment and clinical outcomes for individuals with diabetes. This review examined the interventions based upon three focus areas: 1) scheduling the patient with their provider; 2) getting the patient to their appointment, and; 3) having patient information integral to their diabetes care available to the provider. The literature review showed that simple phone call and letter of reminders for scheduling or prompting the date and time of an appointment to more complex web-based multidisciplinary programs can have a positive impact on clinical and behavioral outcomes for diabetes patients (Nuti et al., 2015).

The participants of focus interviews have proposed many options to improve the appointment system such as 1- ) to do FPG one day before the following update, 2- ) to book time slots for patients over all the workings hours, 3- ) to book time slots for uncontrolled patients an appointment after 12 pm as the patients are fewer after this time and thus they can get more contact time and attention, and 4-) to improve counseling with patients.

## 4.4 Provider factors

### 4.4.1 Knowledge, skills and experience of health providers

According to focus groups interviews, approximately all participants stated that they have the appropriate knowledge and skills to serve diabetic patients, but a 42 years old physician expressed that" *new physicians need to learn how to manage and follow up diabetic clients and how to deal with diabetes complications like a diabetic foot*".

Another 36 years old physician stated that" *The knowledge we have is enough for our work, but we need diabetologist for assessing resistant uncontrolled cases*" which reflect the lack of needed knowledge and skills for those patients. Another 32 years old nurse stated that" *The overload prevent us from applying our knowledge and skills*", which reflect the effect of overload in managing diabetes patients.

Many studies have revealed that there is a negative relation between knowledge and the number of years that physicians had been in practice (Choudhry et al., 2005; Ayanian et al., 1994; Salem-Schatz et al., 1990). Thus, UNRWA diabetes health providers need to standardize their provided services, to periodical assess staff knowledge and skills.

### 4.4.2 Diabetic health providers training

In UNRWA, there are 2 types of training, in-service training, in which the staff trained outside the work stations, and on the job training, in which staff trained during their actual work by their direct supervisors.

The findings of focus group discussions have revealed that there are inconsistent opinions about training, especially which the in-service training like Micro Clinic Initiative for Diabetes (MCI) family health teams providing services for diabetes clients. But many staff, especially the new ones didn't take any kind of in-service training about diabetes management.

A 48 years old nurse stated that "*We need more a refresher training on the available TI*", referring to guidelines of diabetes management, which been subjected to different modifications. Another 38 years old doctor stated that" *We need to learn more about communications with diabetic patients, how to deal with diabetes complications and others updates in diabetes management*". Another important part was that in-service training was just for fixed-term staff, but not for other categories of staff like daily based staff and job creation program staff. Participants revealed that they need more training opportunities in different areas like communications skills, diabetes complications, new diabetes drugs, lifestyle, foot care, and self-care.

Staff training not only increases competitively but also supports achieving the organizational goal, thus, good training and developing new approaches of learning will help the organization grow and retain its staff members and achieve better outcomes (Allencomm, 2017).

### 4.4.3 Compliance with diabetic management protocols

According to focus groups interviews, there is high compliance to UNRWA guidelines and protocols (TI), a 42 years old doctor stated that" *Approximately 80% we follow the TI*" and when they were asked about the reasons of noncompliance, the main causes were work overload and poor supervision. Another 32 years old nurse stated that" *Frequent several changes in TI*" which reflect the recurrent changes in diabetes care services, including the addition of new drugs and laboratory tests. In other the hand, another 48 years nurse stated that" *Recurrent changing of the provider lead to noncompliance to TI*", which reflect that

when the main diabetes health provider is absent, the substitute staff does not always follow the TI.

Barth and Collogues (2015) have shown that those clinicians who adhere to Clinical Practice Guidelines (CPG) provide better outcomes for their patients and the importance of CPG is to keep consistency and to ensure that everyone participle in reducing clinical errors (Barth et al., 2015). Continued supervision and monitoring are needed to improve the compliance of UNRWA diabetes health service providers with TI.

### 4.4.4 Clients contact time with providers

The health provider-diabetic patient contact time was assessed by an abstract sheet of a total 90 patients (15 patients from every health center) were observed from the moment they entered the diabetic nurse waiting area until they received treatment from the pharmacy. The average waiting time at the nursing station was15 minutes with a maximum time 24 minutes at Naser health center and minimum time of 5 minutes at Dier Alballah health center. The average contact time with nurses was 4.2 minutes with a maximum time of 5.4 minutes at Sheikh Radwan health center, and minimal time of 2.9 minutes at Maen health center (figure 4.6).

The average waiting time at the doctor station was 9.4 minutes with a maximum time of 19.3 minutes at Sheikh Radwan health center and minimum time of 3.6 minutes at Rafah health center. The average contact time with the doctor was 4.4 minutes with a maximum time of 6.1 minutes at Naser health center and minimum time of 2.7 minutes at Maen health center (figure 4.6).

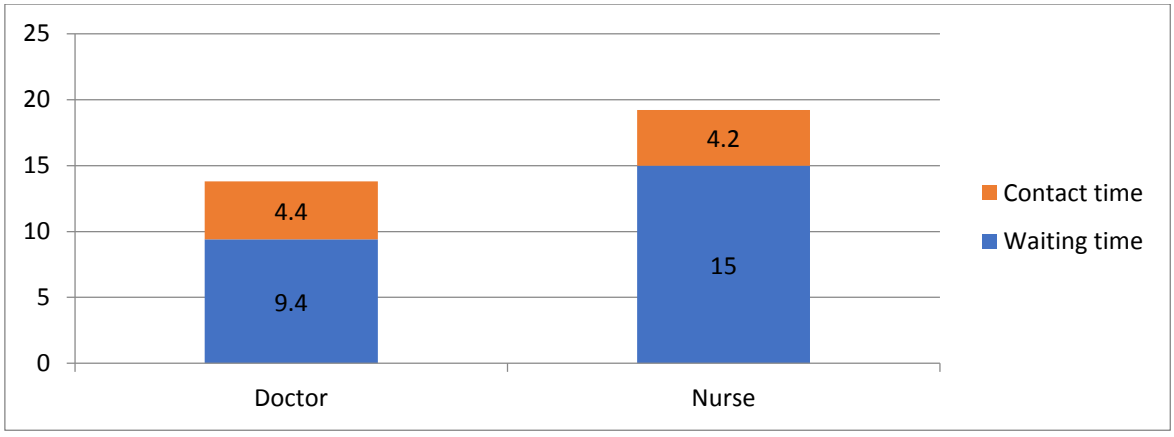


**Figure (4.6): Diabetic patients waiting and contact time per minute**

The average consultation time per doctor in 2017 was 3.1 minutes for Gaza field (UNRWA, 2017), the difference could be explained by the fact that UNRWA calculates the consultation time for all clients. In general, diabetic patients need more consultation time than for instance clients who are utilizing daily care services.

Contact time is very important, for both the patient and the health provider. Petek Šter, Švab & Živčec Kalan (2008), studied consultation time related factors and found that the mean consultation time was 6.9 minutes. Longer consultation time was related to: patient factors like: female gender, higher age, higher level of education, higher number of health problems and change of physician within the last year. Also related to physician factors like higher age, physicians' workload (absence of high workload), and the type of visit (consultation and/or clinical examination) (Petek Šter, Švab & Živčec Kalan, 2008).

Ahmad and Colleagues assessed patient waiting time and doctor consultation time in a primary healthcare clinic and found that more than half of the patients were registered within 15 minutes (53%) and the average total waiting time to see the doctor was 41 minutes, the mean consultation time was 18.21 minutes (Ahmad et al., 2017).

According to Doubova and Colleagues (2009), the family doctor spends sufficient time on the consultation of patients suffering from DM2 and/or hypertension in Mexico, and that play an important role in those patients satisfaction (Doubova et al., 2009).

## 4.5 DM2 Services

### 4.5.1 DM2 self-care education

**Inside health center DM2 self-care education**

As shown in Table (4.6), 74% of participants did not receive DM2 self-care education inside the health center, and only 26% have received DM2 self-care education. However, when the study participants were asked about the DM2 self-care education components such as diet, physical activity, and quitting smoking, the results were quite different and

almost contradictory (approximately 70% of study participants have received health education on diet, physical activity or smoking cessation). This may be a result of the study participants' lack of understanding of health education and its components. This was evident through the DM2 self-care education needs required by the study participants (symptoms of low and high blood sugar level (93.1%), and followed by DM2 complications with 88.9%, diet by 59%, exercise by 27.8%, DM2 follow up by 22.9% and finally, medication administration by 20.1% ). It also reflects the study participants' need for more health education. This is evident in the percentage of study participants who believe that health education is beneficial 91.5%.

Many studies showed the importance of DM self-care education, especially its roles on good glycemic control, lowering of complications and enhancing in the quality of life (ADA, 2009; Povey, 2007; Odegard, 2007; Deakin, 2005; Boule, 2001).

The ADA had reviewed the standards of DMs self-care education and found that there was a four-fold increase in diabetic complications for those individuals with DM who had not received formal education concerning self-care practices (Mensing, 2006).

Nearly three-quarters of diabetic patients did not receive adequate DM self-care education, although this was an important part of the treatment plan as instructed by UNRWA guidelines for NCD (2009). This, unfortunately, will lead to poor glycemic control of diabetics' patients and increased diabetic related-complications. This result may be explained by the shortage of contact time between diabetic patients and health providers as discussed before, 4.2 minutes for a nurse, and 4.4 minutes for doctors. The same concern was expressed by health providers during focus groups, in which they did reflect that overload prevents them from applying their knowledge and skills, which include the diabetes self-care education for diabetics patients.

**Table (4.6): Distribution of study participants according to Diabetes self-care education**

| Items | No. | % |
|---|---|---|
| **Receiving self-care education about diabetes inside the health center before** | | |
| Yes | 106 | 26.0 |
| No | 302 | 74.0 |
| **Total** | **408** | **100.0** |
| **The timing of diabetes self-care education** | | |
| Only at the time of diagnosis | 9 | 8.5 |
| Regularly, every follow-up visit | 91 | 85.8 |
| Irregularly, during the follow-up visits | 6 | 5.7 |
| **Total** | **106** | **100.0** |
| **Diabetes self-care education** | | |
| Nurse | 91 | 85.8 |
| Family doctor | 15 | 14.2 |
| **Total** | **106** | **100.0** |
| **The benefit of diabetes self-care education** | | |
| Not beneficial | 9 | 8.5 |
| Beneficial- to some extent | 74 | 69.8 |
| Beneficial to a large extent | 23 | 21.7 |
| **Total** | **106** | **100.0** |
| **Diabetes self-care educational materials** | | |
| Yes | 152 | 37.3 |
| No | 256 | 62.7 |
| **Total** | **408** | **100.0** |
| **Diet or eating habits** | | |
| Yes | 289 | 70.8 |
| No | 119 | 29.2 |
| **Total** | **408** | **100.0** |
| **Physical activity or exercise** | | |
| Yes | 310 | 76.0 |
| No | 98 | 24.0 |
| **Total** | **408** | **100.0** |
| **Quit smoking** | | |
| Yes | 25 | 69.4 |
| No | 11 | 30.6 |
| **Total** | **36** | **100.0** |
| **Diabetic self-care education needs** | | |
| Signs and symptoms of high and low blood sugar level | 134 | 93.1 |
| Diabetes complications | 128 | 88.9 |
| Diet | 85 | 59.0 |
| Exercise | 40 | 27.8 |
| Diabetes follow up | 33 | 22.9 |
| Importance of taking medication regularly | 29 | 20.1 |
| **Rating your understanding of DM as a disease** | | |
| Excellent | 115 | 28.2 |
| Good | 220 | 53.9 |
| Acceptable | 65 | 15.9 |
| Poor | 8 | 2.0 |
| **Total** | **408** | **100.0** |

The main self-care educator for diabetics according to the study results was the nurse (85.8%) and this result can be for several reasons, first of all, that the nurse only manages diabetics, unlike the doctor who manages different types of patients, second, the nurse receives fewer patients than the doctor (40 for the nurse and 85 to the doctor according to the UNRWA annual health report 2017), third, contact time with the nurse longer than with the doctor.

### 4.5.2 Diabetes follow up care

**Conducting regular follow up care**

The majority of (95.1%) participants have conducted regular follow up visits to UNRWA's health centers, and only 4.9% of the study participants did not regularly conduct follow up visits. The main reasons for not conducting regular follow-up care were: not having time as reported by 65%of clients who did not conduct regular, followed by the physically being inactive as reported by 30% of clients who did not conduct regular follow up, and other causes as expressed by 5% of clients who did not conduct regular follow up.

The high percentage of patients who regularly conduct follow up visits reflects patients understanding of the importance of conducting regular follow up and the high utilization of UNRWA's services.

Only half of the participants who do not conduct regular follow up visits were approached by the service providers. This result may be due to UNRWA criteria for defaulters (missing more than 2 appointments) and the busy schedule of the team, and finally, it could also reflect a gap in the service provider that needs to be addressed.

**Blood sugar monitoring**

In total, 93.4% of the study participants monitor their blood glucose at the UNRWA health center exclusively, 3.4% of the study participants do that sometimes outside the UNRWA health centers, and only 3.2% monitor their blood glucose level outside the UNRWA health center. The main causes of monitoring blood glucose level outside the UNRWA health center were to save time (as expressed by 51.9%), followed by to confirm and validate the results of testing at UNRWA health center (18.5%) and to do blood sugar test at night time (11.1%).

Although this result reflects the high acceptability and credibility in UNRWA diabetic services, it also clearly reflects the hard financial situation of Palestine refugees in Gaza, that they can't afford the cost of accessing health other services.

Less than one-quarter (22.8%) of participants have their own glucometer, of them, only 36.6% can afford the cost of purchasing glucometer strips. This low percentage means only 22.5% of clients have the ability to self-monitor their blood glucose (SMBG). Regular SMBG is linked to improved glycemic control through a multitude of pathways of causes (Karter, 2006).

Karterand Colleagues (2000) reported that utilization of SMBG was inversely associated with out-of-pocket costs, and this "price elasticity" was significantly higher among the poorest patients. Nyomba and Colleagues (2002) have also confirmed a reduce in strip use with increased spending using a trial that randomized patients to either receive free test strips or pay full price for test strips.

### 4.5.3 Distribution of the study participants according to their Perception about Diabetes complications screening within UNRWA clinics-last year

**Diabetic fundus eye examination**

As shown in Table (4.7), 62.5% of study participant had done their annual fundus eye examination during the last year, unfortunately, 37.5% of study participants did not do their annual fundus eye examinations.

This result of this study is consistent with the results of USA fundus eye examination, in which 62.8% of diabetic adults aged 18 years or older had done a dilated eye exam in the last year (CDC, 2018). The above percentage does not reflect the actual percentage of clients who regularly conduct fundus eye examination as UNRWA does not have ophthalmologist. Currently, UNRWA jointly with San John Eye Clinic-Gaza is implementing a project that aims to screen 20000of diabetic clients.

For sustainability, it is recommended that UNRWA hire ophthalmologist or ophthalmologic nurses who can efficiently conduct the diabetic fundus examination.

Approximately all the participants who have done the fundus eye annual examination were informed about the outcomes of their examination (99.6%). A total of 15% of the fundus

eye examination revealed abnormal findings such as retinopathy, surprisingly, only 39.5% of those patients with abnormal findings, their treatment regimen was changed, accordingly.

The abnormal findings could measure the prevalence of diabetic retinopathy (15%). This low prevalence of diabetic retinopathy is low compared to international prevalence like in the USA which is about one-third of adults over age 40 years with diabetes, and more than one-third of African-Americans and Mexican-Americans (CDC, 2018). The low detection rate may be due to absent of established national system of screening for diabetic retinopathy.

Diabetic retinopathy is one of the most preventable causes of vision loss and blindness. Early detection and treatment can prevent or delay blindness due to diabetic retinopathy in 90% of people with diabetes (CDC, 2018).

**Diabetic Foot Screening**

As shown in Table (4.7), 73.8 % of study participant had done their foot screening exam during the last year, and 26.2 % of study participants did not do their foot screening exam. This result was higher than the USA result, in which at 2010, the age-adjusted percentage of adults aged 18 years or older with diagnosed diabetes receiving a foot exam in the last year was 67.5% (CDC, 2018).

Approximately all the participants who have done the foot screening were informed about the outcomes of their examination (98.7%). A total of 9.8% of foot screening revealed abnormal findings such as ulcers and neuropathy, surprisingly, only 31% of those patients with abnormal findings, their treatment regimen was changed, accordingly.

The abnormal findings could measure the prevalence of diabetic foot (9.8%). This low prevalence of diabetic foot is low compared to international studies. According to the Joslin Diabetes Center, one in four people with diabetes will develop a foot condition that requires intervention (Joslin, 2018).

**Laboratory annual analysis**

As shown in Table (4.7), 93.6 % of study participant had done their annual laboratory analysis during the last year, unfortunately, 6.4% of study participants did not do their annual laboratory analysis.

Approximately three quarters (75.1%) of the participants who have done the annual laboratory analysis were informed about the outcomes of their analysis. A total of 36.9 % of the annual laboratory analysis revealed abnormal findings such as high HbA1c and lipids profile tests, surprisingly, 12.3 % of those patients with abnormal findings, their treatment regimen was not changed, accordingly.

The abnormal findings could measure the prevalence of uncontrolled diabetic patients (36.9 %). This low prevalence of diabetic retinopathy is low compared to HbA1c study results which are 76.2% of study participants are uncontrolled (HbA1c more than 7%).

The low percentage of changing diabetes management according to screening results (eye, foot, and even laboratory analysis) lead to missing the benefit of screening interventions (early detection and early management to prevent complications), but this may be explained by misconception of diabetic patient that diabetes management is only by drugs, and if no change in drugs done, that means no change in management done.

Also, the study results reflect the poor communications between DM2 health provider and the DM2 patient. Appropriate and effective health provider-patient communication is very important in enhancing the management process and the outcome.

Patients reporting good communication with their doctor are more likely to be satisfied with their care, and especially to share pertinent information for accurate diagnosis of their problems, follow advice, and adhere to the prescribed treatment (Henrdon & Pollick, 2002). Physician communication is significantly positively correlated with patient adherence; there is a 19% higher risk of non-adherence among patients whose physician communicates poorly than among patients whose physician communicates well. Training physicians in communication skills result in substantial and significant improvements in patient adherence such that with physician communication training, the odds of patient adherence are 1.62 times higher than when a physician receives no training (Zolnierek & Dimatteo, 2009).

Clever, Levinson & Meltzer (2008) studied the doctor-patient Communication and its effect on patient Satisfaction with Hospital Care, and found that there was a significant positive relationship between overall satisfaction and overall ratings of attendings' communication behaviors, with an increase in overall satisfaction of 0.58 points on a 5-point scale for each 1-point increase in overall attendings' communication behaviors, p<.001 (Clever, Levinson & Meltzer, 2008).

When diabetes patients play central roles in setting their own self-care goals, they are more likely to adhere to treatment plans (Olivarius,2001; Glasgow & Anderson,1999). More effective patient-provider communication can lead to better self-care behavior as well as improvements in health outcomes ( Heisler et al.,2002; Anderson,1995).

**Table (4.7): Distribution of the study participants according to diabetes complications screening within UNRWA clinics (last year)**

| **Items** | **No.** | **%** |
|---|---|---|
| **Fundus eye examination was done in the last year** | | |
| Yes | 255 | 62.5 |
| No | 153 | 37.5 |
| Total | 408 | 100.0 |
| **Diabetic clients informed about their fundus eye examination result** | | |
| Yes | 254 | 99.6 |
| No | 1 | 0.4 |
| Total | 255 | 100.0 |
| **The fundus eye examination result was** | | |
| Good | 216 | 85 |
| Abnormal | 38 | 15 |
| Total | 254 | 100 |
| **Changing in diabetes management according to fundus eye examination result** | | |
| Yes | 15 | 39.5 |
| No | 23 | 60.5 |
| Total | 38 | 100.0 |
| **Diabetes foot screening was done in the last year** | | |
| Yes | 301 | 73.8 |

| | | |
|---|---|---|
| No | 107 | 26.2 |
| Total | 408 | 100.0 |
| **Diabetic clients informed about their foot screening results** | | |
| Yes | 297 | 98.7 |
| No | 4 | 1.3 |
| Total | 301 | 100.0 |
| **The diabetic foot screen results were** | | |
| Good | 268 | 90.2 |
| Abnormal | 29 | 9.8 |
| Total | 297 | 100.0 |
| **Changing in diabetes management according to foot screen result** | | |
| Yes | 9 | 31 |
| No | 20 | 69 |
| Total | 29 | 100.0 |
| **Annual laboratory analysis was done in the last year** | | |
| Yes | 382 | 93.6 |
| No | 26 | 6.4 |
| Total | 408 | 100.0 |
| **Diabetics informed about their results of annual laboratory analysis** | | |
| Yes | 287 | 75.1 |
| No | 95 | 24.9 |
| Total | 382 | 100.0 |
| **The annual laboratory analysis result was** | | |
| Good | 181 | 63.1 |
| Abnormal | 106 | 36.9 |
| Total | 287 | 100.0 |
| **Changing in diabetes management according to the annual laboratory analysis result** | | |
| Yes | 93 | 87.7 |
| No | 13 | 12.3 |
| Total | 106 | 100.0 |

## 4.6 Outcomes of Type 2 diabetes services

### 4.6.1 Control status as assessed by HbA1c level

Within this study, the control status was assessed by HbA1c, and it is considered the most reliable and sensitive indicator that could be used to assess the controlled status of DM2, it is used to predict the complications and mortality caused by DM2. HbA1c assesses the control status of blood glucose level in the blood over the past 3 months.

Per UNRWA guidelines, HbA1c 7 % or less is considered controlled diabetic status, and above 7% is considered uncontrolled status. Findings of the study revealed that only 23.8% of DM2 patient's type 2 are controlled according to HbA1c.

**The relation between HbA1C and clients age**

As shown in Table (4.8), the more controlled study participants according to HbA1c were the participants with age more than 60 years old (27.3%), and the less controlled study participants according to HbA1c were the participants with age between 50 and 60 years old (20.4%).

A chi-squared test was conducted to examine whether there was a significant difference between study participants age groups with regard to their controlling status. The test revealed no statistically significant difference between participants age groups with regard to controlled status ($X^2 = 2.079$, $p = 0.354$). These findings are inconsistent with Doubeuez and Xue (2014) study which revealed that HbA1c increases with age, even after controlling other variables including race, body mass index, and glucose level (Doubeuez&Xue, 2014).

**The relation between HbA1C and gender**

As shown in Table (4.8), the female study participants were more controlled according to HbA1c level (27.4%), than male study participants (17.4%). A chi-squared test was conducted to examine whether there was a significant difference between study participants male participants and female participants with regard to their controlling status. The test revealed a statistically significant difference between male participants

(17.4%) and female participants (27.4%) with regard to controlled status, the differences were statistically significant ($X^2$ = 5.181, p = 0.015). These findings are consistent with Chole, Muge, and Shuguan, (2013) study, which revealed that women had a lower mean HbA1c value compared with men, also there was a gender-specific association between age and HbA1c (Chole, Muge, & Shuguan, 2013).

**The relation between HbA1C and the level of education**

As shown in Table (4.8), the more controlled study participants according to HbA1c were the participants with less than 12 years of schooling (24.4%), and the less controlled study participants according to HbA1c were the participants with 12 years and above of schooling (22.9%).

A chi-squared test was conducted to examine whether there was a significant difference between study participants years of schooling groups with regard to their controlling status. The test revealed no statistically significant difference between participants schooling years groups with regard to controlled status ($X^2$ = 0.112, p = 0.416).

These findings are consistent with Al Rasheedi (2014) study, which revealed that the education level does not have a significant effect on glycemic control, even though, patients with higher education level had a better awareness of the complications and a higher rate of adherence to diabetic diet (Al Rasheedi, 2014).

**The relation between HbA1C and smoking status**

As shown in Table (4.8), the more controlled study participants according to HbA1c were the participants who never smoked (26.6%), and the less controlled study participants according to HbA1c were clients who have been current smokers (13%).

A chi-squared test was conducted to examine whether there was a significant difference between smokers and non-smokers with regard to their controlling status The test revealed a statistically significant difference between smokers (26.6%) and non-smokers (13%) with regard to controlled status, the differences were statistically significant ($X^2$ = 6.156, p = 0.046). This finding is consistent with Jenny (2002) study, which revealed that cessation of smoking leads to a reduction of HbA1c by 0.7%. It is well-known that smoking increases

insulin resistance thus increasing HbA1c (Jenny, 2002). The study result emphases the importance of smoking cessation in controlling diabetes status. Awareness sessions and campaigns are needed.

**The relation between HbA1C and disease duration**

As shown in Table (4.8), the more controlled study participants according to HbA1c were the participants who have been diagnosed with DM2 over the past three years or less (27.4%), and less controlled study participants who been diagnosed with DM2 for 4 to 10 years (21.9%). A chi-squared test was conducted to examine whether there was a significant difference between study participants disease duration groups with regard to their controlling status. The test revealed no statistically significant difference between participants disease duration groups with regard to controlled status ($X^2$ = 1.097, p = 0.578). These findings are inconsistent with Yigazu and Desse (2017) study, which revealed that level of education ($p < 0.001$) and duration of diabetes treatment ($p < 0.001$) were significantly associated with glycemic control (Yigazu & Desse, 2017).

**The relation between HbA1C and co-morbidities**

As shown in Table (4.8), the more controlled study participants according to HbA1c were the participants with other co-morbidities (24.8%), and the less controlled study participants according to HbA1c were the participants without other co-morbidities (21.1%).

A chi-squared test was conducted to examine whether there was a significant difference between study participants disease co-morbidities groups with regard to their controlling status. The test revealed no statistically significant difference between participants co-morbidities groups with regard to controlled status ($X^2$ = 0.647, p = 0.252). These findings are inconsistent with Halabi (2018) study, which revealed that there is a statistically significant relationship between hb1c level and coexisting of HTN (Halabi, 2018).

**Table (4.8): The relation between participants control status as assessed by HbA1c level and different variables**

| Age | HbA1c | | | | | | $X^2$ | Sig. |
|---|---|---|---|---|---|---|---|---|
| | Uncontrolled | | Controlled | | Total | | | |
| | No. | % | No. | % | No. | % | | |
| Less than 50 years | 77 | 75.5 | 25 | 24.5 | 102 | 100 | 2.079 | 0.354 |
| From 50 to 60 years | 133 | 79.6 | 34 | 20.4 | 167 | 100 | | |
| 61 years and more | 101 | 72.7 | 38 | 27.3 | 139 | 100 | | |
| Total | 311 | 76.2 | 97 | 23.8 | 408 | 100 | | |
| **Gender** | | | | | | | 5.181 | 0.015 |
| Male | 123 | 82.6 | 26 | 17.4 | 149 | 100 | | |
| Female | 188 | 72.6 | 71 | 27.4 | 259 | 100 | | |
| Total | 311 | 76.6 | 97 | 23.8 | 408 | 100 | | |
| **Years of schooling** | | | | | | | 0.112 | 0.416 |
| Less than 12 years | 180 | 75.6 | 58 | 24.4 | 238 | 100 | | |
| 12 years and above | 131 | 77.1 | 39 | 22.9 | 170 | 100 | | |
| Total | 311 | 76.2 | 97 | 23.8 | 408 | 100 | | |
| **Smoking** | | | | | | | 6.156 | 0.046 |
| Yes | 40 | 87.0 | 6 | 13.0 | 46 | 100 | | |
| No | 232 | 73.4 | 84 | 26.6 | 316 | 100 | | |
| Previous smoker | 39 | 84.8 | 7 | 15.2 | 46 | 100 | | |
| Total | 311 | 76.2 | 97 | 23.8 | 408 | 100 | | |
| **Disease duration** | | | | | | | 1.097 | 0.578 |
| 3 years and less | 77 | 72.6 | 29 | 27.4 | 106 | 100 | | |
| From 4 to 10 years | 132 | 78.1 | 37 | 21.9 | 169 | 100 | | |
| More than 10 years | 102 | 76.7 | 31 | 23.3 | 133 | 100 | | |
| Total | 311 | 76.2 | 97 | 23.8 | 408 | 100 | | |
| **Co-morbidities** | | | | | | | 0.647 | 0.252 |
| Yes | 221 | 75.2 | 73 | 24.8 | 294 | 100 | | |
| No | 90 | 78.9 | 24 | 21.1 | 114 | 100 | | |
| Total | 311 | 76.6 | 97 | 23.8 | 408 | 100 | | |

**The relation between HbA1C and diabetic patients' knowledge**

As shown in Table (4.9), the study participants with a better score of diabetes self-care knowledge, were the participants with uncontrolled status according to HbA1c (77.10%), and the worse score of diabetes self-care knowledge were the participants with controlled status according to HbA1c (76.14%). An independent samples t-test was conducted to examine whether there was a significant difference between participants diabetes self-care knowledge level with regard to their controlling status. The test revealed no statistically significant difference between participants diabetes self-care knowledge level with regard to controlled status ($t = 0.697$, $p = 0.486$).

These findings are consistent with Al-Maskari and Colleagues (2013) study, which revealed that knowledge, practice, and attitude scores were all not statistically significantly related to HbA1c ( Al-Maskari et al., 2013).

**The relation between HBA1C and diabetic patients perceived quality**

As shown in Table (4.9), the study participants who perceive that diabetes services of good quality, were the participants with uncontrolled status according to HbA1c (87.51%), and the study participants who perceive that diabetes services of less quality, were the participants with controlled status according to HbA1c (86.82%). An independent samples t-test was conducted to examine whether there was a significant difference between participants perceive quality level with regard to their controlling status. The test revealed no statistically significant difference between participants perceive quality level with regard to controlled status ($t = 0.670$).

**The relation between HBA1C and diabetic patients' satisfaction**

As shown in Table (4.9), the more satisfied study participants were the participants with uncontrolled status according to HbA1c (84.20%), and the less satisfied study participants were the participants with controlled status according to HbA1c (83.64%). An independent samples t-test was conducted to examine whether there was a significant difference between participants satisfaction level with regard to their controlling status. The test revealed no statistically significant difference between participants satisfaction level with regard to controlled status ($t = 0.500$). These findings are consistent with Al Shahrani and Barajas (2014) study about the patient satisfaction and it's a relation to diabetic control in a

primary care setting, which show no association between satisfaction with other patient's characteristics and HbA1c (Al Shahrani&Baraja, 2014). Also is consistent with Wilson and Colleagues (2004) study about treatment satisfaction after the treatment of insulin in DM2, which revealed that there was no relationship between weight gain, HbA1c, and total or subscale scores of satisfaction (Wilson et al., 2004).

**Table (4.9): Relation between HBA1C and diabetic patients knowledge, perceived quality domains, satisfaction**

| | HbA1c | No. | Mean | SD | t | Sig. |
|---|---|---|---|---|---|---|
| **Knowledge** | Uncontrolled | 311 | 77.10 | 11.74 | 0.654 | 0.513 |
| | Controlled | 97 | 76.14 | 15.11 | | |
| **Tangibles** | Uncontrolled | 311 | 87.89 | 7.70 | 0.803 | 0.422 |
| | Controlled | 97 | 87.15 | 8.62 | | |
| **Empathy** | Uncontrolled | 311 | 91.04 | 9.73 | 0.752 | 0.453 |
| | Controlled | 97 | 90.19 | 9.71 | | |
| **Reliability** | Uncontrolled | 311 | 91.56 | 8.71 | 0.267 | 0.790 |
| | Controlled | 97 | 91.29 | 8.76 | | |
| **Responsiveness** | Uncontrolled | 311 | 85.64 | 8.57 | 0.141 | 0.888 |
| | Controlled | 97 | 85.50 | 8.38 | | |
| **Assurance** | Uncontrolled | 311 | 89.79 | 8.67 | -1.06 | 0.290 |
| | Controlled | 97 | 90.85 | 8.33 | | |
| **Satisfaction** | Uncontrolled | 311 | 84.20 | 7.45 | 0.675 | 0.500 |
| | Controlled | 97 | 83.64 | 6.45 | | |
| **Overall** | Uncontrolled | 311 | 87.51 | 6.43 | 0.426 | 0.670 |
| | Controlled | 97 | 86.82 | | | |

### 4.6.2 Utilization of diabetes complication screening

The rate of diabetes complications screening is considered relatively high (62.5% fundus eye examination, 73.8 % foot screening exam and 93.6 % annual laboratory analysis) when compared to different findings across the globe such as Han and Colleagues (2016) in Korea, which revealed that 37.1% of diabetics had been screened for diabetic retinopathy or diabetic nephropathy (Han et al., 2 016), and the study of Perera and Colleagues (2015), in Sri Lanka which revealed that annual retinopathy screening was performed in only 61%

of patients, while nephropathy and neuropathy screening was offered to 43% and 32% respectively (Perera et al., 2015).

The study results revealed that the percentage of screened diabetic patients in UNRWA health centers were similar to USA diabetic patients screened by fundus eye exam (62.8% in the USA at 2015) and even more than USA diabetic patients screened by foot screening exam (67.5% in the USA at 2015) (CDC, 2018).

The above percentage does not reflect the actual percentage of clients who regularly conduct fundus eye examination as UNRWA does not have ophthalmologist. This high percentage of a fundus eye exam is due to UNRWA jointly with San John Eye Clinic-Gaza are implementing a project that aims to screen 20000 of diabetic clients.

The study results revealed that unfortunately, the improper communication between health providers and diabetic patients' could be one of the reasons of less compliance with diabetes complications screening, thus, reducing the likelihood of early detecting, thus, reducing the complications of diabetes.

Findings of focus groups discussions revealed that there are different barriers that prevent diabetic patients from utilizing diabetes services at UNRWA health centers, which can be divided into intra clinic and extra clinic barriers. Intra clinic barriers include long waiting time, diabetic patients' refusal of clients to some treatment options, namely insulin, limited availability of specialized services, mistrust relationship between service providers and clients, and limited clients knowledge about drugs.

Extra clinic barriers include the physical distance between home and the clinic, transportation cost, and clinic working hours that are not convenient to clients.

### 4.6.3 Perceived quality and satisfaction

As shown in Table (4.10), 87.43% of study participants perceive that diabetic services offered by UNRWA clinics as of good quality, and 84.07% of them are satisfied with these services. This perceived quality percentage was higher than the result reported by Safi (2018) about the UNRWA family health team approach which was 75% (Safi, 2018).

Worldwide, the percentage of perceived quality differs according to the study population. For example, in Nigeria, according to Falayi and Colleagues (2018), more than half (55.0%) of the respondents perceive the quality of diabetic care as good (Falayi et al., 2018). Hanberger, Ludvigsson & Nordfeldt (2006), investigated the perceived quality of diabetes care of a geographic population of 400 DM1 patients <20 years- Sweden, they found that high perceived quality of care was reported from both parents and youth (Hanberger, Ludvigsson & Nordfeldt, 2006).

As shown in Table (4.10), the higher percentage was reported on the reliability domain with a mean of 91.50%, (SD 8.71), which can be explained by the deteriorating political and economic situation of GS, in which the government health services suffer from the financial crisis that makes the availability of drugs, thus, quality of provided service real challenges. The lower percentage was reported on the satisfaction domain with 84.07%, (SD 7.22), which may be related to non-health services like bathrooms cleanness and waiting time

**Table (4.10): Distribution of the study participants according to their perceived quality and satisfaction**

| | Domain | Weighted Mean | Median | SD |
|---|---|---|---|---|
| **1.** | **Tangibles** | 87.71% | 88.33 | 7.93 |
| **2.** | **Empathy** | 90.83% | 92.00 | 9.72 |
| **3.** | **Reliability** | 91.50% | 95.00 | 8.71 |
| **4.** | **Responsiveness** | 85.60% | 83.33 | 8.51 |
| **5.** | **Assurance** | 90.04% | 92.00 | 8.59 |
| **6.** | **Satisfaction** | 84.07% | 81.82 | 7.22 |
| | **Overall** | 87.43% | 88.11 | 6.30 |

**Perceived quality domains**

**Perceived Tangibles**

As shown in Table (4.11), most participants expressed their agreement that diabetes health services provided by UNRWA are tangibles with a mean of 87.7 and SD 7.93.

The higher mean was reported to the ease of booking an appointment with 91%, which may reflect the effectiveness of e-health system. On the other hand, the lowest mean of the agreement was reported under the availability of equipment in the clinics with 83.4%, this percentage is very good and reflects that centers are equipped with the needed equipment from clients' perspective. This does not exclude that fact that supplying health centers with needed new and advanced equipment is always needed.

**Table (4.11): Distribution of the study participants according to their perceived tangibles**

| Items | | Sever Disagree | Disagree | Neutral | Agree | Sever Agree | Weighted Mean |
|---|---|---|---|---|---|---|---|
| The service providers are well dressed and appear neat | N | 1 | 0 | 5 | 280 | 122 | 85.6% |
| | % | 0.2 | 0.0 | 1.2 | 68.6 | 29.9 | |
| The health center is clean | N | 1 | 0 | 4 | 265 | 138 | 86.4% |
| | % | 0.2 | 0.0 | 1.0 | 65.0 | 33.8 | |
| The health center is equipped with modern and up-to-date equipment | N | 1 | 6 | 20 | 277 | 104 | 83.4% |
| | % | 0.2 | 1.5 | 4.9 | 67.9 | 25.5 | |
| The physical appearance of the health center is visually appealing and attractable | N | 2 | 5 | 4 | 191 | 206 | 89.2% |
| | % | 0.5 | 1.2 | 1.0 | 46.8 | 50.5 | |
| The center operating hours are convenient for you | N | 0 | 2 | 2 | 177 | 227 | 90.8% |
| | % | 0.0 | 0.5 | 0.5 | 43.4 | 55.6 | |
| Booking an appointment is easy | N | 0 | 2 | 1 | 177 | 228 | 91.0% |
| | % | 0.0 | 0.5 | 0.2 | 43.4 | 55.9 | |
| **Mean = 87.71, SD = 7.93** | | | | | | | |

**Perceived Empathy**

As shown in Table (4.12), most participants expressed their agreement that DM2s health services provided by UNRWA are empathetic with the mean of 90.83and SD 9.72.

The higher mean of the agreement was reported to the attention paid by a health provider to their patients with 91.2%. On the other hand, the lowest mean of the agreement was reported to the attention paid by a health provider to their patient's beliefs and emotions with 90.6%.

**Table (4.12): Distribution of the study participants according to their perceived empathy**

| Items | | Sever Disagree | Disagree | Neutral | Agree | Sever Agree | Weighted Mean |
|---|---|---|---|---|---|---|---|
| Health providers are polite and deal with clients in a friendly way | N | 0 | 1 | 6 | 176 | 225 | 90.6% |
| | % | 0.0 | 0.2 | 1.5 | 43.1 | 55.1 | |
| Health providers pay attention to their patients | N | 0 | 1 | 5 | 168 | 234 | 91.2% |
| | % | 0.0 | 0.2 | 1.2 | 41.2 | 57.4 | |
| Health providers pay attention to the patient's beliefs and emotions | N | 0 | 3 | 4 | 176 | 225 | 90.6% |
| | % | 0.0 | 0.7 | 1 | 43.1 | 55.1 | |
| Health providers take into account their clients interest | N | 0 | 1 | 4 | 173 | 230 | 91.0% |
| | % | 0.0 | 0.2 | 1 | 42.4 | 56.4 | |
| Health providers understand the needs of their patients | N | 0 | 3 | 2 | 173 | 230 | 90.8% |
| | % | 0.0 | 0.7 | 0.5 | 42.4 | 56.4 | |
| **Mean = 90.83, SD = 9.72** | | | | | | | |

**Perceived Reliability**

As shown in Table (4.13), most participants expressed their agreement that DM2 health services provided by UNRWA are reliable with a mean of 91.50 and SD 8.71.

The higher mean of reliability was reported to prompt response of health provider to patient inquiries and requests with a mean of 94%. On the other hand, the lowest mean of reliability was reported to the availability of appropriate timely services with 89.8%, this percentage is high.

**Table (4.13): Distribution of the study participants according to their perceived reliability**

| Items | | Sever Disagree | Disagree | Neutral | Agree | Sever Agree | Weighted Mean |
|---|---|---|---|---|---|---|---|
| Health providers respect patients appointments | N | 0 | 0 | 3 | 161 | 244 | 91.8% |
| | % | 0.0 | 0 | 0.7 | 39.5 | 59.8 | |
| Health providers provide clients with the appropriate timely services | N | 0 | 0 | 3 | 202 | 203 | 89.8% |
| | % | 0.0 | 0 | 0.7 | 49.5 | 49.8 | |
| Health providers address all your concerns | N | 0 | 1 | 1 | 186 | 220 | 90.6% |
| | % | 0.0 | 0.2 | 0.2 | 45.6 | 53.9 | |
| Health providers response to your questions and requests | N | 0 | 0 | 2 | 119 | 286 | 94.0% |
| | % | 0.0 | 0 | 0.5 | 29.2 | 70.3 | |
| **Mean = 91.50, SD = 8.71** | | | | | | | |

**Perceived Responsiveness**

As shown in Table (4.14), most participants expressed their agreement that DM2 health services provided by UNRWA are responsiveness to their needs, with a mean of 85.6% and SD 8.51.

The higher mean of responsiveness was the willingness of health provider to help diabetic patients with a mean of 88.6%. On the other hand, the lowest mean of responsiveness was reported the prompt response of health providers to diabetic patients non-health needs with a mean of 81.6%. This percentage is very good, but this does not exclude the need for improving the health centers infrastructure and design to meet all patients' needs including the non-health ones.

**Table (4.14): Distribution of the study participants according to their perceived responsiveness**

| Items | | Sever Disagree | Disagree | Neutral | Agree | Sever Agree | Weighted Mean |
|---|---|---|---|---|---|---|---|
| Health providers promptly respond to clients health needs | N | 0 | 0 | 6 | 248 | 154 | 87.2% |
| | % | 0.0 | 0.0 | 1.5 | 60.8 | 37.7 | |
| Health providers promptly respond to clients non-health needs | N | 0 | 11 | 30 | 284 | 83 | 81.6% |
| | % | 0.0 | 2.7 | 7.4 | 69.6 | 20.3 | |
| Health providers are always willing to help clients | N | 0 | 1 | 5 | 220 | 182 | 88.6% |
| | % | 0.0 | 0.2 | 1.2 | 53.9 | 44.6 | |
| Health providers understand the specific needs of their clients | N | 0 | 1 | 5 | 263 | 139 | 86.4% |
| | % | 0.0 | 0.2 | 1.2 | 64.5 | 34.1 | |
| Health providers are never too busy to respond to clients request | N | 0 | 0 | 7 | 267 | 134 | 86.2% |
| | % | 0.0 | 0.0 | 1.7 | 65.4 | 32.8 | |
| Health providers treat all diabetic patients equally | N | 2 | 5 | 31 | 250 | 120 | 83.6% |
| | % | 0.5 | 1.2 | 7.6 | 61.3 | 29.4 | |
| **Mean = 85.60 , SD = 8.51** | | | | | | | |

**Perceived Assurance**

As shown in Table (4.15), most participants expressed their agreement that DM2 health services provided by UNRWA are assuring to them, with a mean of 90.04 and SD 8.59.

The higher mean of assuring was the provision of services that improve the activity of diabetic patients' daily living and alleviating their symptoms with a mean of 91% which may reflect the main goal of the diabetic patient visit to the health center.

**Table (4.15): Distribution of the study participants according to their perceived assurance**

| Items | | Sever Disagree | Disagree | Neutral | Agree | Sever Agree | Weighted Mean |
|---|---|---|---|---|---|---|---|
| Health providers promote your self-confidence | N | 0 | 2 | 3 | 206 | 197 | 89.4% |
| | % | 0.0 | 0.5 | 0.7 | 50.5 | 48.3 | |
| Health providers make you feel safe | N | 0 | 0 | 5 | 208 | 195 | 89.4% |
| | % | 0.0 | 0.0 | 1.2 | 51 | 47.8 | |
| Health providers are consistently considerate with you | N | 0 | 0 | 2 | 211 | 195 | 89.4% |
| | % | 0.0 | 0.0 | 0.5 | 51.7 | 47.8 | |
| Health providers provide you with services that improve the activity of your daily living | N | 0 | 0 | 1 | 181 | 226 | 91.0% |
| | % | 0.0 | 0.0 | 0.2 | 44.4 | 55.4 | |
| Health providers provide you with services that alleviate your symptoms | N | 0 | 0 | 1 | 180 | 227 | 91.05 |
| | % | 0.0 | 0.0 | 0.2 | 44.1 | 55.6 | |
| **Mean = 90.04 , SD = 8.59** | | | | | | | |

**Perceived Satisfaction**

As shown in Table (4.16), most participants expressed their satisfaction with UNRWA DM2 health services, with a mean of 84.07 and SD 7.22.

In the satisfaction domain, the most satisfying issue for study participants was the easiness of making an appointment with a mean of 88.8%, as discussed before, and the lowest level of satisfaction was reported on waiting time, with a mean of 77.2%, which may reflect the long time in which the patient spent waiting for the services.

It is important to mention that service providers' interactions with patients during consultation session take high satisfaction scores like welcoming and greeting of the service provider, and the service provider respect of patients' privacy with a mean of 88.4% for each.

**Table (4.16): Distribution of participants according to their perceived satisfaction**

| Items | | Sever Dissatisfied | Dissatisfied | Neutral | Satisfied | Sever Satisfied | Weighted Mean |
|---|---|---|---|---|---|---|---|
| Making an appointment for follow up visit | N | 0 | 1 | 1 | 222 | 184 | 88.8% |
| | % | 0.0 | 0.2 | 0.2 | 54.4 | 45.1 | |
| Waiting time | N | 8 | 34 | 27 | 279 | 60 | 77.2% |
| | % | 2.0 | 8.3 | 6.6 | 68.4 | 14.7 | |
| The convenience of the waiting area | N | 6 | 19 | 10 | 299 | 74 | 80.4% |
| | % | 1.5 | 4.7 | 2.5 | 73.3 | 18.1 | |
| Welcoming and greeting of service providers | N | 0 | 0 | 5 | 226 | 177 | 88.4% |
| | % | 0.0 | 0.0 | 1.2 | 55.4 | 43.4 | |
| The time that the health providers spent with you | N | 1 | 2 | 8 | 286 | 111 | 84.8% |
| | % | 0.2 | 0.5 | 2.0 | 70.1 | 27.2 | |
| The services providers' explanations about diabetic services | N | 1 | 9 | 10 | 316 | 72 | 82.0% |
| | % | 0.2 | 2.2 | 2.5 | 77.5 | 17.6 | |
| The services providers' respect for clients privacy | N | 0 | 1 | 4 | 225 | 178 | 88.4% |
| | % | 0.0 | 0.2 | 1.0 | 55.1 | 43.6 | |
| The way services providers teach you about improving clients health | N | 3 | 15 | 22 | 282 | 86 | 81.2% |
| | % | 0.7 | 3.7 | 5.4 | 69.1 | 21.1 | |
| The overall health services you received from clients providers | N | 0 | 0 | 3 | 299 | 106 | 85.0% |
| | % | 0.0 | 0.0 | 0.7 | 73.3 | 26.0 | |
| The performance of all health providers | N | 0 | 0 | 4 | 311 | 93 | 84.4% |
| | % | 0.0 | 0.0 | 1.0 | 76.2 | 22.8 | |
| Clients general satisfaction about the diabetes services that have been provided from the health center | N | 0 | 0 | 1 | 321 | 86 | 84.2% |
| | % | 0.0 | 0.0 | 0.2 | 78.7 | 21.1 | |
| **Mean = 84.07, SD = 7.22** | | | | | | | |

One of the interesting results that the way services providers teach the patients about improving their health was the second lowest score of satisfaction with a mean of 82%, which reflects that relative lack of self-care health education and the need to encourage the service providers to improve it. These results are inconsistent with Hanberger, Ludvigsson & Nordfeldt (2006) study, which revealed that highest perceived quality was seen for a possibility to talk to nurse/doctor in privacy, respect, general atmosphere, continuity in patient-physician relationship and patient participation. The lower perceived reality with higher subjective importance was seen for information about results from medical examinations and treatments and information about self-care, access to care and waiting time. (Hanberger, Ludvigsson & Nordfeldt, 2006).

The satisfaction level reported by this study was higher that than the level reported by Elkahtib (2018), in which the overall satisfaction level with services for non-communicable diseases was 72% (Elkahtib, 2018).

As shown in Table (4.17), the overall satisfaction of services received through UNRWA DM2 health services is very high (97.2%). Thus, the vast majority, almost all clients will recommend (99.3%) utilization of UNRWA DM2 health services to their relatives and friends. Furthermore, 99.8% of study participants will continue to receive DM2 health services from UNRWA health centers. This could be due to limited other options of DM2 health services like MoH, in which lack of hypoglycemic drugs severely affect the service access and utilization, also the private health provider is expensive for the majority of DM2 patients.

Furthermore, 94 .6% of study participants perceive that diabetes health services met their expectations, and 98.3% of study participants expressed that their health status is better after receiving UNRWA DM2 health services. These findings are higher than the results of Safi (2018) study about the family health team approach (FHTA) evaluation, in which he found that 62.7% of study participants felt that FHTA met their expectations, and also only 39.6% are satisfied to a high extent with FHTA services. These differences reflect the specificity of diabetes health services at UNRWA health department and the effort exerted by UNRWA to improve it.

**Table (4.17): Distribution of the study participants according to other satisfaction questions**

| Items | No. | % |
|---|---|---|
| **Recommending UNRWA diabetes services to relatives and friends** | | |
| Yes | 405 | 99.3 |
| No | 3 | .7 |
| Total | 408 | 100.0 |
| **Intend to continue receiving the services from this center** | | |
| Yes | 407 | 99.8 |
| No | 1 | .2 |
| Total | 408 | 100.0 |
| **Satisfied with the services received today** | | |
| To a high extent | 398 | 97.5 |
| Uncertain | 9 | 2.2 |
| Not satisfied | 1 | .2 |
| Total | 408 | 100.0 |
| **Diabetes services that you received today met your expectations** | | |
| Yes | 385 | 94.6 |
| To some extent | 21 | 5.2 |
| No | 1 | 0.2 |
| Total | 407 | 100.0 |
| **If no, how did you expect the services to be** | | |
| Better | 1 | 100.0 |
| Worse | 0 | 0.0 |
| Total | 1 | 100.0 |
| **Describing your health status after receiving services from this center** | | |
| Good | 401 | 98.3 |
| The same | 3 | .7 |
| I don't know | 4 | 1.0 |
| Total | 408 | 100.0 |

**The relationship between some demographic variables and perceived quality domains**

**Governorate in comparison with participants perceived tangibles**

As shown in Table (4.18), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different governorates groups in relation to tangibles quality domain. The results revealed a statistically significant across the five governorates and tangible quality domain, with (F= 6.024, P = 0.00). Gaza governorate study participants reported a significantly higher level of tangibles with mean 91.11%, and Rafah governorate study participants reported a significantly lower level of tangibles with a mean 85.63%.

Post hoc Scheffe test has revealed that Rafah governorate study participants perceive UNRWA diabetes health services fewer tangibles with 5.48 than Gaza governorate participants, and fewer tangibles with 3.72 than North governorate participants. The differences were statistically significant.

**Governorate in comparison with participants perceived empathy**

As shown in Table (4.18), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different governorates groups in relation to empathy quality domain. The results revealed a statistically significant across the five governorates and empathy quality domain, with (F= 13.803, P = 0.00), Dier Alballah governorate study participants reported a significantly higher level of empathy with mean 95.20%, and Rafah governorate study participants reported a significantly lower level of empathy with a mean 86.33%.

Post hoc Scheffe test has revealed that Rafah governorate study participants perceive UNRWA diabetes health services less empathic with 8.68 than Dier Alballah governorate participants, and less empathic with 7.58 than Gaza governorate participants, and less empathic with 5.77 than North governorate participants. The differences were statistically significant.

**Governorate in comparison with participants perceived reliability**

As shown in Table (4.18), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different governorates groups in relation to the quality domain, reliability. The results revealed a statistically significant across the five governorates and reliability quality domain, with (F= 13.276, P = 0.00), Dier Alballah governorate study participants reported a significantly higher level of reliability with mean 95.81%, and Khanyounis governorate study participants reported a significantly lower level of reliability with a mean 88.12%.

Post hoc Scheffe tests have revealed that Rafah governorate study participants perceive UNRWA diabetes health services less reliable with 7.42 than Dier Alballah governorate participants, and less reliable with 4.73 than Gaza governorate participants, and less reliable with 4.37 than North governorate participants. The differences were statistically significant.

**Governorate in comparison with participants perceived responsiveness**

As shown in Table (4.18), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different governorates groups in relation to responsiveness quality domain. The results revealed a statistically significant across the five governorates and responsiveness quality domain, with (F= 5.414, P = 0.00). Gaza governorate study participants reported a significantly higher level of responsiveness with mean 88.33%, and Rafah governorate study participants reported a significantly lower level of responsiveness with a mean 82.53%.

Post hoc Scheffe tests have revealed that Rafah governorate study participants perceive UNRWA diabetes health services less responsive with 5.79 than Gaza governorate participants, and less responsive with 4.67 than Dier Alballah governorate participants. The differences were statistically significant.

**Governorate in comparison with participants perceived assurance**

As shown in Table (4.18), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different governorates groups in relation to assurance quality domain. The results revealed a statistically

significant across the five governorates and assurance quality domain, with (F= 6.494, P = 0.00). Gaza governorate study participants reported a significantly higher level of assurance with mean 94.58%, and Rafah governorate study participants reported a significantly lower level of assurance with a mean 87.96%.

Post hoc Scheffe tests have revealed that Rafah governorate study participants perceive UNRWA diabetes health services less assurance with 6.62 than Gaza governorate participants. The difference was statistically significant.

**Governorate in comparison with participants perceived satisfaction**

As shown in Table (4.18), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different governorates groups in relation to the quality domain, satisfaction. The results revealed a statistically significant across the five governorates and satisfaction quality domain, with (F= 3.347, P = 0.010), Gaza governorate study participants reported a significantly higher level of satisfaction with a mean of 86.10%, and Rafah governorate study participants reported a significantly lower level of satisfaction with a mean 82.22. But Post hoc Scheffe tests have revealed no statistically significant difference between Rafah governorate study participants satisfaction and other governorate study participants.

**Governorate in comparison with participants all perceived quality domains**

As shown in Table (4.18), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different governorates groups in relation to overall perceived quality domains. The results revealed a statistically significant across the five governorates and overall perceived quality domains, with (F= 8.885, P = 0.00).

Gaza governorate study participants reported a significantly higher level of perceived quality with mean 90.24%, and Rafah governorate study participants reported a significantly lower level of perceived quality with a mean 84.82%.

**Table (4.18): The relation between perceived quality, satisfaction and governorates**

| Domains | Governorates | No. | Mean | SD | F | Sig. |
|---|---|---|---|---|---|---|
| **Tangibles** | North Gaza | 107 | 89.35 | 8.00 | 6.024 | 0.000 |
| | Gaza | 48 | 91.11 | 7.48 | | |
| | Dier Alballah | 80 | 86.21 | 8.66 | | |
| | Khan Younis | 77 | 87.49 | 7.24 | | |
| | Rafah | 96 | 85.63 | 7.11 | | |
| | Total | 408 | 87.71 | 7.93 | | |
| **Empathy** | North Gaza | 107 | 92.11 | 10.70 | 13.803 | 0.000 |
| | Gaza | 48 | 93.92 | 8.81 | | |
| | Dier Alballah | 80 | 95.20 | 8.55 | | |
| | Khan Younis | 77 | 88.21 | 8.48 | | |
| | Rafah | 96 | 86.33 | 8.44 | | |
| | Total | 408 | 90.83 | 9.72 | | |
| **Reliability** | North Gaza | 107 | 92.76 | 8.39 | 13.276 | 0.000 |
| | Gaza | 48 | 93.13 | 8.16 | | |
| | Dier Alballah | 80 | 95.81 | 7.73 | | |
| | Khan Younis | 77 | 88.12 | 8.43 | | |
| | Rafah | 96 | 88.39 | 8.32 | | |
| | Total | 408 | 91.50 | 8.71 | | |
| **Responsiveness** | North Gaza | 107 | 86.14 | 9.18 | 5.414 | 0.000 |
| | Gaza | 48 | 88.33 | 7.44 | | |
| | Dier Alballah | 80 | 87.21 | 8.21 | | |
| | Khan Younis | 77 | 85.32 | 8.76 | | |
| | Rafah | 96 | 82.53 | 7.47 | | |
| | Total | 408 | 85.60 | 8.51 | | |
| **Assurance** | North Gaza | 107 | 89.27 | 8.40 | 6.494 | 0.000 |
| | Gaza | 48 | 94.58 | 7.26 | | |
| | Dier Alballah | 80 | 91.85 | 8.01 | | |
| | Khan Younis | 77 | 88.99 | 8.66 | | |
| | Rafah | 96 | 87.96 | 8.87 | | |
| | Total | 408 | 90.04 | 8.59 | | |
| **Satisfaction** | North Gaza | 107 | 85.22 | 8.14 | 3.347 | 0.010 |
| | Gaza | 48 | 86.10 | 7.34 | | |
| | Dier Alballah | 80 | 83.66 | 6.05 | | |
| | Khan Younis | 77 | 83.94 | 7.65 | | |
| | Rafah | 96 | 82.22 | 6.22 | | |
| | Total | 408 | 84.07 | 7.22 | | |
| **Overall** | North Gaza | 107 | 88.33 | 6.91 | 8.885 | 0.000 |
| | Gaza | 48 | 90.24 | 4.99 | | |
| | Dier Alballah | 80 | 88.63 | 5.04 | | |
| | Khan Younis | 77 | 86.45 | 6.73 | | |
| | Rafah | 96 | 84.82 | 5.75 | | |
| | Total | 408 | 87.43 | 6.30 | | |

Post hoc Scheffe tests have revealed that Rafah governorate study participants perceive UNRWA diabetes health services less quality with 5.41 than Gaza governorate participants, and less quality with 3.80 than Dier Alballah governorate participants, and less quality with 3.51 than North governorate participants. The differences were statistically significant.

**Health centers and participants perceived tangibles**

As shown in Table (4.19), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants place of receiving health services centers in relation to tangibles quality domain. The results revealed a statistically significant across the six health centers and tangible quality domain, with (F= 5.133, P = 0.00). Al-Sheikh Radwan health center study participants reported a significantly higher level of perceived tangibles with mean 91.59, and Rafah health center study participants reported a significantly lower level of perceived tangibles with a mean of 85.54%. Post hoc Scheffe test has revealed that Rafah health centers study participants perceive UNRWA diabetes health services fewer tangibles with 6.05 than Al Sheikh Radwan health centers participants ( p=0.003), the differences were statistically significant.

**Health centers and participants perceived empathy**

As shown in Table (4.19), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different health centers groups in relation to empathy quality domain. The results revealed a statistically significant across the six health centers and empathy quality domain, with (F= 11.327, P = 0.00), Dier Alballah health center participants reported significantly higher level of perceived empathy with mean of 95.20%, and Rafah health center study participants reported a significantly lower level of perceived empathy with a mean of 86.00%. Post hoc Scheffe test has revealed that Rafah health centers study participants perceive UNRWA diabetes health services less empathic with 9.2 than Dier Alballah health centers participants, and less empathic with 8.08 than Al Sheikh Radwan health centers participants, and less empathic with 6.07 than Jabalia health centers participants. The differences were statistically significant.

**Health centers and participants perceived reliability**

As shown in Table (4.19), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different health centers groups in relation to reliability quality domain. The results revealed a statistically significant across the six health centers and reliability quality domain, with (F= 11.023, P = 0.00). Dier Alballah health center study participants reported a significantly higher level of perceived reliability with a mean of 95.81%, and Rafah health center study participants reported a significantly lower level of perceived reliability with a mean of 88.02%. Post hoc Scheffe test has revealed that Rafah health centers study participants perceive UNRWA diabetes health services less reliable with 7.78 than Dier Alballah health centers participants, and less reliable with 5.45 than Al Sheikh Radwan health centers participants, and less reliable with 4.59 than Jabalia health centers participants. The differences were statistically significant.

**Health centers in comparison with participants perceived responsiveness**

As shown in Table (4.19), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different health centers groups in relation to responsiveness quality domain. The results revealed a statistically significant across the six health centers and responsiveness quality domain, with (F= 5.066, P = 0.00). Al-Sheikh Radwan health center study participants reported a significantly higher level of perceived responsiveness with mean 88.62%, and Rafah health center study participants reported a significantly lower level of perceived responsiveness with a mean 82.05%. Post hoc Scheffe test has revealed that Rafah health centers study participants perceive UNRWA diabetes health services less responsive with 6.56 than Al Sheikh Radwan health centers participants, and less responsive with 5.45 than Dier Alballah health centers participants. The difference was statistically significant.

**Health centers and participants perceived assurance**

As shown in Table (4.19), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different health centers groups in relation to assurance quality domain, The results revealed a statistically significant across the six health centers and assurance quality domain, with (F= 5.454, P =

0.00). Al-Sheikh Radwan health center study participants reported a significantly higher level of perceived assurance with mean 94.78%, and Rafah health center study participants reported a significantly lower level of perceived assurance with a mean 87.72%. Post hoc Scheffe tests have revealed that Rafah health centers study participants perceive UNRWA diabetes health services less assurance with 7.06 than Al Sheikh Radwan health centers participants, The difference was statistically significant.

**Health centers and participants perceived satisfaction**

As shown in Table (4.19), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different health centers groups in relation to satisfaction quality domain. The results revealed a statistically significant across the six health centers and satisfaction quality domain, with (F= 3.037, P = 0.011). Al-Sheikh Radwan health center study participants reported a significantly higher level of perceived satisfaction with mean 86.48%, and Rafah health center study participants reported a significantly lower level of perceived satisfaction with a mean 81.97%. Post hoc Scheffe test has revealed that Rafah health centers study participants perceive UNRWA diabetes health services less satisfaction with 4.51 than Al Sheikh Radwan health centers participants, The difference was statistically significant.

**Health centers in comparison with participants all perceived quality domains**

As shown in Table (4.19), a one-way ANOVA test was conducted to examine whether there were statistically significant differences among participants in different health centers groups in relation to all quality domains. The results revealed a statistically significant across the six health centers and all quality domains, with (F= 7.816, P = 0.00). Al-Sheikh Radwan health center study participants reported a significantly higher level of all perceived quality domains with mean 90.56%, and Rafah health center study participants reported a significantly lower level of all perceived quality domains with a mean 84.54%. Post hoc Scheffe tests have revealed that Rafah health centers study participants perceive UNRWA diabetes health services less quality with 6.02 than Al Sheikh Radwan health centers participants, and less quality with 4.09 than Dier Alballah health centers participants, and less quality with 3.68 than Jabalia health centers participants. The differences were statistically significant.

The findings of this study are consistent with Falayi and Colleagues study (2018), in which they studied the patients' perception of quality of DM care received in Ibadan, Nigeria, and they revealed that health facility was significantly associated with perceived quality of diabetes care (Falayi et al., 2018).

**Table (4.19): Health center and perceived quality domains**

| Domains | Health Center | No. | Mean | SD | F | Sig. |
|---|---|---|---|---|---|---|
| **Tangibles** | Jabalia | 109 | 89.17 | 8.03 | 5.133 | 0.000 |
| | Al-Sheikh Radwan | 46 | 91.59 | 7.26 | | |
| | Dier Alballah | 80 | 86.21 | 8.66 | | |
| | Maen | 77 | 87.49 | 7.24 | | |
| | Al Naser | 10 | 86.33 | 6.18 | | |
| | Rafah | 86 | 85.54 | 7.24 | | |
| | Total | 408 | 87.71 | 7.93 | | |
| **Empathy** | Jabalia | 109 | 92.07 | 10.69 | 11.327 | 0.000 |
| | Al-Sheikh Radwan | 46 | 94.09 | 8.71 | | |
| | Dier Alballah | 80 | 95.20 | 8.55 | | |
| | Maen | 77 | 88.21 | 8.48 | | |
| | Al Naser | 10 | 89.20 | 9.62 | | |
| | Rafah | 86 | 86.00 | 8.29 | | |
| | Total | 408 | 90.83 | 9.72 | | |
| **Reliability** | Jabalia | 109 | 92.61 | 8.41 | 11.023 | 0.000 |
| | Al-Sheikh Radwan | 46 | 93.48 | 8.09 | | |
| | Dier Alballah | 80 | 95.81 | 7.73 | | |
| | Maen | 77 | 88.12 | 8.43 | | |
| | Al Naser | 10 | 91.50 | 9.14 | | |
| | Rafah | 86 | 88.02 | 8.20 | | |
| | Total | 408 | 91.50 | 8.71 | | |
| **Responsiveness** | Jabalia | 109 | 86.06 | 9.12 | 5.066 | 0.000 |
| | Al-Sheikh Radwan | 46 | 88.62 | 7.46 | | |
| | Dier Alballah | 80 | 87.21 | 8.21 | | |
| | Maen | 77 | 85.32 | 8.76 | | |

| Domains | Health Center | No. | Mean | SD | F | Sig. |
|---|---|---|---|---|---|---|
| | Al Naser | 10 | 86.67 | 8.61 | | |
| | Rafah | 86 | 82.05 | 7.23 | | |
| | Total | 408 | 85.60 | 8.51 | | |
| **Assurance** | Jabalia | 109 | 89.28 | 8.43 | | |
| | Al-Sheikh Radwan | 46 | 94.78 | 7.05 | | |
| | Dier Alballah | 80 | 91.85 | 8.01 | | |
| | Maen | 77 | 88.99 | 8.66 | 5.454 | 0.000 |
| | Al Naser | 10 | 90.00 | 9.48 | | |
| | Rafah | 86 | 87.72 | 8.82 | | |
| | Total | 408 | 90.04 | 8.59 | | |
| **Satisfaction** | Jabalia | 109 | 85.07 | 8.14 | | |
| | Al-Sheikh Radwan | 46 | 86.48 | 7.23 | | |
| | Dier Alballah | 80 | 83.66 | 6.05 | | |
| | Maen | 77 | 83.94 | 7.65 | 3.037 | 0.011 |
| | Al Naser | 10 | 84.36 | 7.48 | | |
| | Rafah | 86 | 81.97 | 6.05 | | |
| | Total | 408 | 84.07 | 7.22 | | |
| **Overall** | Jabalia | 109 | 88.23 | 6.89 | | |
| | Al-Sheikh Radwan | 46 | 90.56 | 4.82 | | |
| | Dier Alballah | 80 | 88.63 | 5.04 | | |
| | Maen | 77 | 86.45 | 6.73 | 7.816 | 0.000 |
| | Al Naser | 10 | 87.24 | 6.81 | | |
| | Rafah | 86 | 84.54 | 5.59 | | |
| | Total | 408 | 87.43 | 6.30 | | |

**Study participants gender influence on perceived quality domains**

As shown in Table (4.20), the more study participants perceive that diabetes services of quality were the female participants (88.31%), and the fewer study participants perceive that DM2 services of quality were the male participants (85.91%).

Also, the more study participants satisfied with DM2 services were the female participants (85.01%), and the less satisfied study participants were the male participants (82.44%).

**Table (4.20): Study participants gender influence on perceived quality domains**

| Domains | Gender | No. | Mean | SD | t | Sig. |
|---|---|---|---|---|---|---|
| **Tangibles** | Male | 149 | 86.58 | 8.06 | 2.204 | 0.028 |
| | Female | 259 | 88.37 | 7.79 | | |
| **Empathy** | Male | 149 | 89.75 | 10.33 | 1.720 | 0.086 |
| | Female | 259 | 91.46 | 9.31 | | |
| **Reliability** | Male | 149 | 89.97 | 8.65 | 2.709 | 0.007 |
| | Female | 259 | 92.37 | 8.64 | | |
| **Responsiveness** | Male | 149 | 83.76 | 8.08 | 3.364 | 0.001 |
| | Female | 259 | 86.67 | 8.59 | | |
| **Assurance** | Male | 149 | 88.24 | 8.63 | 3.244 | 0.001 |
| | Female | 259 | 91.07 | 8.41 | | |
| **Satisfaction** | Male | 149 | 82.44 | 7.25 | 3.500 | 0.001 |
| | Female | 259 | 85.01 | 7.05 | | |
| **Overall** | Male | 149 | 85.91 | 6.40 | 3.765 | 0.000 |
| | Female | 259 | 88.31 | 6.08 | | |

An independent samples t-test was conducted to examine whether there was a significant difference between study participants perceived quality domains and satisfaction with regard to their gender status. The test revealed a statistically significant difference study participants perceived quality domains and satisfaction with regard to their gender status ( $t = 3.765$, $p = 0.000$), in favor of female participants, except the perceived empathy domain in which the test revealed no statistically significant difference between male and female study participants in relation to their Perceived empathy ($t = 1.720$, $p = 0.086$).

The findings of this study are inconsistent with Falayi and Colleagues study (2018), in which they studied the patients' perception of quality of DM care received in Ibadan, Nigeria, and they revealed that gender was not significantly associated with perceived quality of diabetes care (Falayi et al., 2018).

**Study participants smoking status influence on perceived quality domains**

As shown in Table (4.21), the more study participants perceive that DM2 services of quality were the never smoked participants (87.86%), and the fewer study participants

perceive that DM2 services of quality were the previous smoker participants (84.88%). Also, the more study participants satisfied with DM2 services were the never smoked participants (84.58%), and the less satisfied study participants were the previous smoker participants (81.38%).

A one-way ANOVA test was conducted to examine whether there was a significant difference between study participants perceived quality domains and satisfaction with regard to their smoking status. Perceived responsiveness ( F = 4.497, P = 0.012), perceived satisfaction( F = 4.341, P = 0.014), and overall quality domains( F = 4.699, P = 0.01) were statistically significant related to smoking status of study participants. But perceived tangibles (F = 1.718, P = 0.181), and perceived assurance (F = 1.755, P = 0.174) were statistically not significant related to smoking status of study participants.

**Table (4.21): Study participants smoking status influence on perceived quality domains**

| Domains | Smoking | No. | Mean | SD | F | Sig. |
|---|---|---|---|---|---|---|
| **Tangibles** | Yes | 46 | 86.81 | 8.89 | 1.718 | 0.181 |
| | Never | 316 | 88.09 | 7.70 | | |
| | Previous Smoker | 46 | 86.01 | 8.33 | | |
| | Total | 408 | 87.71 | 7.93 | | |
| **Empathy** | Yes | 46 | 91.74 | 8.90 | 2.169 | 0.116 |
| | Never | 316 | 91.10 | 9.28 | | |
| | Previous Smoker | 46 | 88.09 | 12.77 | | |
| | Total | 408 | 90.83 | 9.72 | | |
| **Reliability** | Yes | 46 | 92.28 | 8.61 | 2.765 | 0.064 |
| | Never | 316 | 91.79 | 8.69 | | |
| | Previous Smoker | 46 | 88.70 | 8.59 | | |
| | Total | 408 | 91.50 | 8.71 | | |
| **Responsiveness** | Yes | 46 | 85.00 | 7.79 | 4.497 | 0.012 |
| | Never | 316 | 86.18 | 8.34 | | |
| | Previous Smoker | 46 | 82.25 | 9.69 | | |
| | Total | 408 | 85.60 | 8.51 | | |
| **Assurance** | Yes | 46 | 89.22 | 8.72 | 1.755 | 0.174 |
| | Never | 316 | 90.44 | 8.47 | | |
| | Previous Smoker | 46 | 88.09 | 9.14 | | |
| | Total | 408 | 90.04 | 8.59 | | |
| **Satisfaction** | Yes | 46 | 83.24 | 7.85 | 4.341 | 0.014 |
| | Never | 316 | 84.58 | 6.93 | | |
| | Previous Smoker | 46 | 81.38 | 8.01 | | |
| | Total | 408 | 84.07 | 7.22 | | |
| **Overall** | Yes | 46 | 87.04 | 6.48 | 4.699 | 0.01 |
| | Never | 316 | 87.86 | 6.03 | | |
| | Previous Smoker | 46 | 84.88 | 7.32 | | |
| | Total | 408 | 87.43 | 6.30 | | |

# Chapter Five

## Conclusion and Recommendations

### 5.1 Conclusion

GS is suffering from epidemiological transition that characterized by rapid shifting of disease profile from communicable diseases to non-communicable diseases, mainly, diabetes and hypertension. DM 2 is the fifth cause of death and is a main risk factor for other two leading causes of death in Palestine, namely cardiovascular diseases and strokes. UNRWA is a main primary health care provider for Palestinian refugees in the GS.

Health care services to diabetic clients is integrated with a comprehensive package of primary health services provided to all refugees in the GS. Thus, the need for that study was of necessity to evaluate outcomes of the UNRWA DM2 health services, and come up with evidence that could be used to enhance and promote the quality of DM2 health services provided and possibly contribute in developing new policies or enhancing already existing ones to improve overall efficiency and effectiveness of service provision.

The UNRWA DM2 health services was evaluated by assessing the main components and the outcome of DM2 services by using mixed methods study. Quantitative method by developing structured questionnaire to collect data about the patients' perceptions of provided DM2 services from 408 participants and an abstract sheet to document the waiting and contact time for 90 participants. Qualitative method by using focus group discussions to collect data from service providers and focused on provider's perceptions on the provided services, strength and weakness of the provided services and main barriers they face.

The quantitative findings of this study were collected from female (63.5%), and male (36.5%) DM2 patients, with a mean age of 56 years. 84.1% of study participants were married, and about half of male study participants (46.3%) were unemployed compared to 89.2% of women were unemployed.

The study findings have revealed that the average monthly income of the study participants was 1105.82 NIS, only 11.3% of the study participants have an average monthly income above the poverty line, on contrary, 88.7% of the study participants have a monthly income

that is either under the deep poverty line or under the poverty line. Of the study male participants, 30.2% of were smokers at the time of data collection. The mean duration of being diagnosed with diabetes for study participants was 8.8 years and more than two-third (72.1%) have other co-morbidity, mainly hypertension. The major cause for their visit to the health center was to refill their prescriptions. The vast majority of study participants receive their DM2 health care services exclusively from UNRWA health services.

Generally speaking, participants have relatively a good knowledge on DM2, the mean of appropriate knowledge was 76.87 %, the main areas of knowledge deficit among diabetic clients are clients' knowledge on symptoms and signs of hyperglycemia and hypoglycemia, and clients' knowledge on self-care management, including diet, foot care, and follow up.

The majority of the study participants (89.5%) have expressed high accessibility to UNRWA DM2 health services, as only 10.5% have reported accessibility problems mainly financial accessibility due to transportation cost. To receive the needed services, clients need to spent approximately 90 minutes, from which only approximate 8 minutes as contact time with health providers (approximately 4 minutes with each doctor and nurse). Despite such long time, more than to two-third (62.3%) of the study participants consider the spent time is reasonable.

UNRWA DM2 services met the expectation of the vast majority of participants as expressed by 95.8% of the study participants. The main barriers for utilizing DM2 services from the participant's perspective were long waiting time as expressed 77.4% and crowding of health center with (40.2%).

Approximately three quarters (74%) of the study participants did not receive any kind self-care education on DM2 by health care providers. Of those who have received self-care education, it was mainly provided by nurses (85.8%). The study participants have expressed their need to have more knowledge about DM, including of signs and symptoms of hyperglycemia and hypoglycemia, DM treatment modalities and complication and prevention of DM complications

The majority of (95.1%) the study participants conduct regular follow up visits to UNRWA’s health centers, and the main reasons for not conducting regular follow-up care were: not having time as reported by 65% of clients followed by the physically being

inactive as reported by 30%. About 93% of participants monitor their blood sugar at the UNRWA health center exclusively; the rest did it outside UNRWA to save time (as expressed by 51.9%), followed by to confirm and validate the results of testing at UNRWA health center (18.5%) and to do blood sugar test at night time (11.1%).

With regard to DM2 complications screening, less than two-third (62.5%) of study participant had done their annual fundus eye examination during the last year, 73.8 % of study participant had done their foot screening exam during the last year and 93.6 % of study participant had done their annual laboratory analysis during the last year. Compared to international studies, these results were considered as good, but the problem is found in changing the DM2 management accordingly.

Study participants perceive that UNRWA DM2 services are of quality by 87.43 %, and feel satisfied with 84.07 %. The vast majority of participants (99.3%) will recommend the UNRWA DM2 services to their friends and relatives, and they will continue to receive the DM2 services from UNRWA.

The study findings have revealed a statistically significant relationship between the participant's place (governorate and health center) with overall perceived quality, the perceived quality and satisfaction are low in the southern governorate and health centers mainly Rafah compared to other areas.

In addition, there is a statistically significant relationship between the participants', gender with overall perceived quality, female participants are more satisfied and consider more UNRWA DM2 health services as of good quality. However, there was no significant relationship between other demographic factors like the age of participants, the marital status of participants, years of schooling, working status, and income with overall perceived quality. For mention, the never smoked participants perceive more DM2 services as of quality (87.86%), and more satisfied (84.58%) compared to smoker or ex-smoker participants.

According to study results, only 23.8% of participants were glycemic control according to HbA1c (more or equal to 7%). Female participants and never smoked participants were the more control participants according to HbA1c. But the medical history, the knowledge of DM2 self-care management were not statistically significantly related to HbA1c.

It is noteworthy that the qualitative study emphasized the importance of health care providers' factors as of knowledge, skills, and experience for providing qualitative DM2 services. The overload of health provider prevents them from do their best to DM2 patients, by shortening the health provider-patient contact time. The health provider considers training as a very important tool for improving the DM2 health services and so they want to get training in an important area of DM2 management like communication, DM2 complications, and DM2 self-care.

The health providers were strongly appreciated the existing of UNRWA technical instructions, and they think that appointment system on UNRWA diabetes services is effective, but the hard-economic situation, make it hard to DM2 patients to commit to the appointment date.

The appropriate health provider-patient contact time is very important to provide qualitative DM2 services, they need at least 10 minutes to do that, but unfortunate they have only 4 minutes to do all necessary job. This short contact time led to previously mentioned poor communication between health provider and patients and insufficient DM2 self-care education.

## 5.2 Recommendations

**General recommendations**

1- Contact time with DM 2 patient needs to increase. This could be achieved by decreasing the health provider workload and effective use of UNRWA e health system, including the appointment system.
2- The DM 2 self-care education should be integrated and considered as a core activity for all diabetic clients. This could be achieved through integrating health education as part of counseling process and distributing written material on self-care
3- The communication and interaction between health provider and patient need to be strengthen through using illustrative means and increasing means of communication.
4- Training of health providers on certain needed areas like communication and self-care management are also recommended. There is a need to increase the staff level of knowledge about DM, particularly about prevention of complications, and treatment modalities
5- The monitoring system within UNRWAs health care centers needs to be strengthened
6- There is a need to updating UNRWA guidelines to include update information about DM 2 management, especially DM 2 complications and uncontrolled patient.
7- Assessing the quality control by using different methods like perceived quality, and patient's satisfaction by using exit interview.
8- Improving the control status of DM 2 is highly importance by enhancing the patient's self-care management.

## 5.3 Recommendation for further research

1- Conduct research studies to further explore of the leading factors affecting the quality of DM2 health services.
2- There is a need to conduct studies to assess the impact of patient-clients interaction on treatment outcomes
3- Assess the role of effective communication between health provider and DM2 patient in improving the HbA1c and preventing the DM2 complications.
4- A national study to assess the current prevalence of DM2 and its complications in the GS is needed.
5- Conduct a national study to assess determinants of controlling status, including the social determinants of DM2.

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# Annexes

## Annex (1): 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: 2017/08/07** **Number:** PHRC/HC/247/17

**Name:** OSAMA A. HAMMAD 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 Type 2 Diabetic Services at UNRWA Health Centers - Gaza Governorate.**

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/247/17 in its meeting on 2017/08/07

و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

**Signature**

**Member** **Member**

**Chairman**

7/8/2017

**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

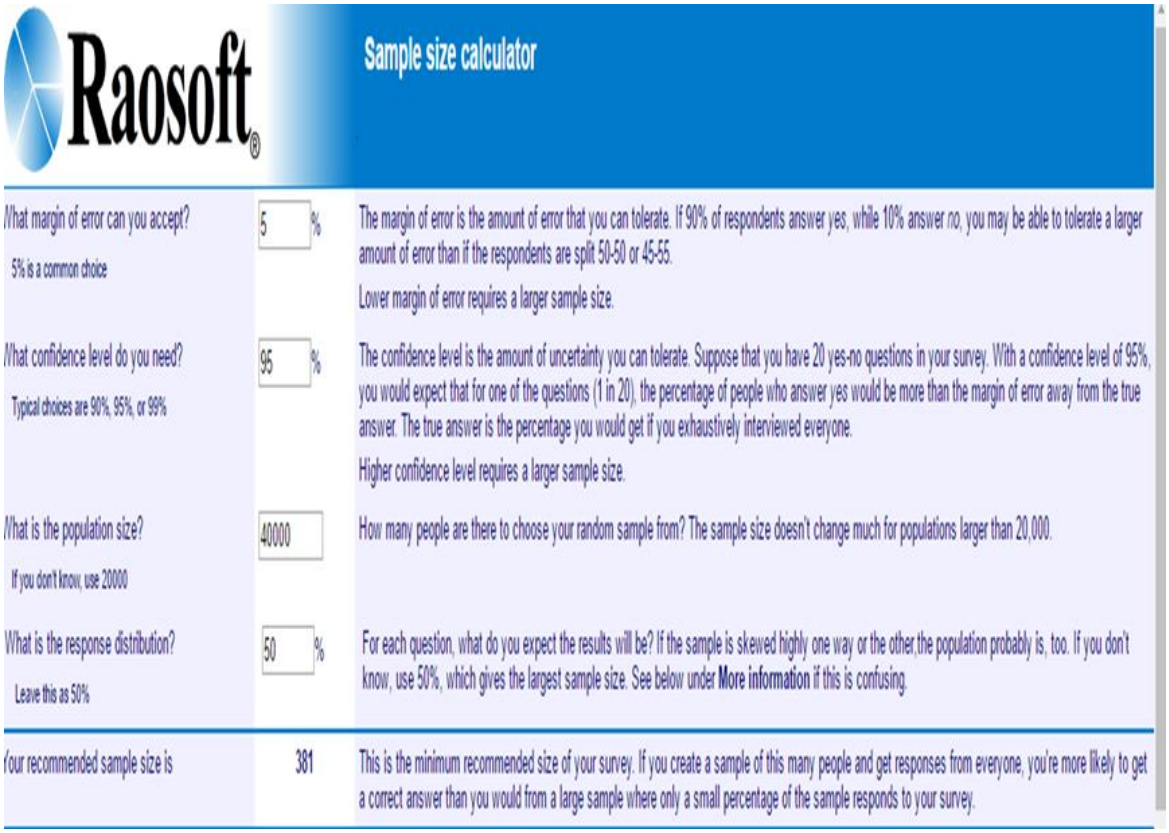
## Annex (2): Time framework.

| Activity | Duration | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Proposal writing | 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 | 2 months | | | | | | | | | | | | | | |
| Data Entry | 2 months | | | | | | | | | | | | | | |
| Data Analysis | 2 months | | | | | | | | | | | | | | |
| Research writing | 2 months | | | | | | | | | | | | | | |

## Annex (3): Health centers and their number of diabetes clients (2016)

| No. | Health Centers | No. of DM patients | Sample No. |
|---|---|---|---|
| **1- North Gaza** | | | |
| 1 | Beit Hanoun | 1108 | |
| 2 | Jabalia | 3099 | 109 |
| 3 | Fakhoura | 2444 | |
| **2- Gaza** | | | |
| 3 | North Gaza | 1819 | |
| 4 | Beach | 1495 | |
| 5 | Rimal | 3720 | |
| 6 | Sheikh Radwan | 1357 | 46 |
| 7 | Daraj (Gaza Town) | 2042 | |
| 8 | Sabra | 2134 | |
| **3- Dier Alballah** | | | |
| 9 | Bureij | 1355 | |
| 10 | Nuseirat | 2944 | |
| 11 | Maghazi | 1121 | |
| 12 | Dier Albalah | 2273 | 80 |
| 13 | West nusirat | 621 | |
| **4- Khanyounis** | | | |
| 14 | Ma'En | 2209 | 77 |
| 15 | Kh/Younis | 3202 | |
| 16 | Kh/Younis (Japanese) | 1030 | |
| 17 | El-Nasser | 293 | 10 |
| **5- Rafah** | | | |
| 18 | Rafah | 2586 | 86 |
| 19 | Tal Sultan | 1730 | |
| 20 | Shaboura | 1086 | |
| 21 | El-Shouka | 339 | |
| | **Total** | **39448** | **408** |

## Annex (4): Sample calculation:



Raosoft®

Sample size calculator

| | | |
|---|---|---|
| What margin of error can you accept? 5% is a common choice | 5 % | The margin of error is the amount of error that you can tolerate. If 90% of respondents answer yes, while 10% answer no, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size. |
| What confidence level do you need? Typical choices are 90%, 95%, or 99% | 95 % | The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer yes would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size. |
| What is the population size? If you don't know, use 20000 | 40000 | How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000. |
| What is the response distribution? Leave this as 50% | 50 % | For each question, what do you expect the results will be? If the sample is skewed highly one way or the other,the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing. |
| Your recommended sample size is | 381 | This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey. |

**Annex (5): The questionnaire and the consent form in Arabic and English version:**

**بسم الله الرحمن الرحيم**

**الموافقة على إجراء استبيان حول دراسة:**

**تقييم الخدمات المقدمة لمرضى السكري النوع الثاني في مراكز الصحة التابعة لوكالة الغوث الدولية- محافظات غزة**

أنا الباحث: أسامة عبد القادر حماد، طالب في برنامج ماجستير الصحة العامة في جامعة القدس، أقوم بعمل بحث علمي و هو جزء من دراستي في الجامعة يهدف الى تقييم الخدمات الصحية المقدمة لمرضى السكري النوع الثاني في المراكز التابعة لوكالة الغوث- محافظات غزة . حيث أن النتائج قد تؤدي الي تحسين الخدمات الصحية المقدمة لمرضى السكري من النوع الثاني.

هناك خيارات للإجابة عن كل سؤال، الرجاء اختيار الإجابة الأقرب إليك و للممارستك الواقعية، مع العلم انه لا توجد إجابات خاطئة و إجابات صحيحة.

المشاركة في هذا البحث تطوعية و لك الحق في الانسحاب متى تشاء مع التأكيد على سرية المعلومات .

الاستبيان قد يستغرق حوالي 15 دقيقة.

أقدر عاليا مشاركتك في البحث.

و تفضلوا بقبول جزيل الشكر

**استبيان تقيم الخدمة الصحية المقدمة لمرضى السكر النوع الثاني في مراكز الصحة الاولية بوكالة الغوث-غزة**

**NCD ID:** **HBA1C:** **Serial No**

| | | |
|---|---|---|
| **1- المعلومات الشخصية.** | | |
| **-1** | اسم المركز الصحي: 1- جباليا. 2- الشيخ الرضوان. 3- دير البلح. 4 - معن. 5- النصر. 6- رفح | |
| **-2** | اسم المحافظة (منطقة المركز): 1 - الشمال. 2- غزة. 3- الوسطى. 4 - خانيونس. 5- رفح. | |
| **-3** | العمر | .....سنة. |
| **-4** | النوع الاجتماعي | 1- ذكر. 2- أنثى. |
| **-5** | الحالة الاجتماعية: 1- متزوج/ة 2- اعزب/عزباء 3- مطلق/ة 4- ارمل/ة 5- منفصل | |
| **-6** | سنوات التعلم | .....سنة. |
| **-7** | هل تعمل حاليا؟ 1- نعم. 2- لا. 3- متقاعد. | |
| **-8** | ادا ما زلت تعمل ،فمادا؟..... | |
| **-9** | ما هو المعدل الدخل الشهري تقريبا للعائلة من جميع المصادر؟.....شيكل. | |
| **-10** | هل تدخن؟ 1- نعم.(اجب 11 و 12) 2- لا(لم ادخن ابد). 3- تارك للدخان( مدخن سابق). | |
| **-11** | ادا كنت تدخن السجائر، فكم عددها؟.....باليوم. | |
| **-12** | ادا كنت تدخن الشيشة، فما الكمية؟.....بالأسبوع. | |
| **-13** | ما سبب زيارتك اليوم للمركز الصحي؟<br>1- زيارة متابعة اعتيادية بموعد مسبق. 2- زيارة متابعة اعتيادية من غير موعد مسبق.<br>3- لعمل تحاليل مخبرية. 4- لأخذ دوائي فقط. 5- اخرى، حدد..... | |
| **2- الملف الصحي.** | | |
| **-14** | مدة مرض السكر لديك؟ | .....سنة. |
| **-15** | هل تتلقى خدمات صحية للسكر من مكان اخر غير الوكالة؟ 1- نعم. 2- لا.(ادا لا لا تجب عن الاسئلة التالية)<br>15.1- من اين؟ 1- الحكومة. 2- المؤسسات الاهلية و الجمعيات. 3- العيادات الخاصة. 4- اخرى، | |

| | |
|---|---|
| | حدد....<br>15.2- لماذا؟ 1- جودة الخمات المقدمة في المركز سيئة. 2- لآني احتاج الى مركز متخصص.<br>3 – ساعات عمل افضل . 4- خصوصية افضل. 5- لتجنب الانتظار الطويل<br>6- اكثر ثقة. 7- اقرب للبيت. 8- اخرى، حدد..... |
| **-16** | هل يوجد لديك اي امراض مزمنة اخرى؟ 1- نعم. 2- لا.<br>16.1- اذا كانت الاجابة بنعم ، الرجاء حدد(ممكن ان تكون اكثر من واجدة). 1- ضغط دم. 2- كلى.<br>3- قلب. 4- صدرية. 5- اخرى، حدد..... |
| **3- القدرة على الحصول على الخدمة.** | |
| **-17** | هل كان من السهل الوصول الى المركز الصحي؟ 1- نعم. 2- لا.<br>اذا كانت الاجابة بلا، فلماذا؟ 1- انا اتي مشيا على الاقدام و احتاج الى وقت طويل.<br>2- انا اتي بالمواصلات عامة و ليست متوفرة دائما او تكلف المال.<br>4- غير ذلك، حدد..... |
| **-18** | هل هذا المركز مؤهل للأشخاص ذوي الاعاقات ؟ 1- نعم. 2- لا. |
| **-19** | في المتوسط ، كم دقيقة تنتظر للدخول الى ممرضك للحصول على الخدمة الصحية لمرضى السكر؟.....دقيقة. |
| **-20** | في المتوسط ، كم دقيقة تنتظر للدخول الى طبيب اسرتك للحصول على الخدمة الصحية لمرضى السكر؟.....دقيقة. |
| **-21** | كم من الوقت تحتاج للحصول على الخدمة الصحية ككل( من دخولك المركز حتى الخروج منه) ؟.....دقيقة. |
| **-22** | من وجهة نظرك، ما رايك في هدا الوقت المستهلك ؟ 1- معقول. 2- طويل. 3- قصير . |
| **-23** | هل الخدمات الصحية الخاصة بمرضى السكر دائما متوفرة في هدا المركز؟<br>1- نعم. 2- لا. 3- بعض الاحيان غير متوفرة.<br>ادا كانت الاجابة بلا، عدد...- دواء معين (اعطي امثلة.....) |

| | |
|---|---|
| | - خدمات معينة (اعطي امثلة.....)<br>- تحاليل معينة (اعطي امثلة.....)<br>- اسباب اخرى، حدد..... |
| **-24** | هل الخدمات الصحية الخاصة بمرضى السكر تلبي رغباتك؟ 1- نعم. 2- لا. لماذا..... |
| **-25** | ما هي المعوقات او الموانع التي تواجهك اثناء تلقيك الخدمة الصحية الخاصة بالسكري في المركز؟<br>1- عدم تنوع الادوية 2- الزحام 3- عدم توفر الخدمات الخاصة 4- ضعف التواصل مع الموظفين.<br>5- الانتظار الطويل. 6- زمن التواصل مع مقدمي الخدمة قصير. 7- مواعيد طويلة المدة<br>8- تحاليل قليلة. 9- اخرى..... |
| **-26** | في العام الماضي هل عدت من المركز من غير ان تتلقى الخدمة التي جات من اجلها؟ 1- نعم. 2- لا.<br>ادا نعم، لمادا..... |
| **4- خدمة متابعة الحالة المرضية.** | |
| **-27** | هل تقوم بزيارة المركز الصحي للحصول غلى الخدمة الخاصة بمرضى السكر بانتظام؟1- نعم. (تخطى السؤال 28) 2- لا.<br>ادا لا لماذا؟ 1- المواصلات غالية الثمن. 2- حركتي و خروجي من المنزل ليس بالسهل.<br>3 - لا املك الوقت الكافي. 4- غير مرحب بي في المركز الصحي.<br>5- لا اثق بالموظفين بالمركز الصحي. 6- الموظفون غير مؤهلون للتعامل مع حالتي.<br>7- احتاج الى مرافق معي. 8- اخرى، حدد..... |
| **-28** | هل تم متابعتك (التواصل معك) بشان عدم زيارتك بانتظام؟ 1- نعم. 2- لا. |
| **-29** | هل تقوم بفحص سكرك بانتظام في العيادة؟ 1- نعم.(تخطى السؤال 30) 2- بعض الاحيان 3- لا. |
| **-30** | اذا كنت تفحص بالخارج فما هي الاسباب؟<br>1- لمراقبة نسبة السكر في الدم خاصة باليل عندما يكون المركز مغلق. 2- انا لا اثق بصحة النتائج في المركز.<br>3- لتوفير الوقت. 4- للتأكد من النتائج. 5- اخرى، حدد..... |

| | | |
|---|---|---|
| **-31** | هل تملك جهاز فحص سكر شخصي(جليكوميتر)؟ 1- نعم 2- لا.(تخطى السؤال 32.) | |
| **-32** | اذا كنت تملك هل تستطيع تحمل نفقاته؟ 1 - نعم 2- لا. 3- بعض الاحيان. | |
| **5- تحري مضاعفات السكري في مراكز الوكالة (العام السابق)** | | |
| **-33** | هل سبق و ان قمت بفحص العيون؟ 1- نعم 2- لا. ( تخطى السؤال 34 .35 .36.) | |
| **-34** | متى كان الفحص؟ | قبل .....شهر. |
| **-35** | هل تلقيت تغذية راجعة عن الفحص؟ 1- نعم 2- لا.(تخطى السؤال 36) | |
| **-36** | اذا كانت ايجابية، هل اثرت نتيجته في خطة علاجك؟ 1- نعم 2- لا. 3- كانت النتائج جيدة | |
| **-37** | هل سبق و ان قمت بفحص القدمين؟ 1- نعم 2- لا. ( تخطى السؤال 38 ،39 ،40.) | |
| **-38** | متى كان الفحص؟ | قبل .....شهر. |
| **-39** | هل تلقيت تغذية راجعة عن الفحص؟ 1- نعم 2- لا. (تخطى السؤال 40) | |
| **-40** | اذا كانت ايجابية، هل اثرت نتيجته في خطة علاجك؟ 1- نعم 2- لا. 3- كانت النتائج جيدة | |
| **-41** | هل سبق و ان قمت بعمل التحاليل السنوية للسكري؟ 1- نعم 2- لا. ( تخطى السؤال 42 .43 .44.) | |
| **-42** | متى كانت هده التحاليل؟ | قبل .....شهر. |
| **-43** | هل تلقيت تغذية راجعة بشان هدة التحاليل؟ 1- نعم 2- لا. (تخطى السؤال 44) | |
| **-44** | اذا كانت ايجابية، هل اثرت نتيجته في خطة علاجك؟ 1- نعم 2- لا. 3- كانت النتائج جيدة | |
| **6- التثقيف الصحي لمرضى السكري.** | | |
| **-45** | هل تلقيت تثقيف صحي عن مرض السكري داخل المركز؟ 1- نعم 2- لا. (اذهب الي السؤال 46)<br>45.1- اذا نعم، متى تلقيته؟<br>1- عندما تم تشخيصي بهذا المرض. 2- في كل زيارة متابعة بانتظام. 3- في كل زيارة متابعة و لكن غير منتظم.<br>45.2- من الذي قدم هذا التثقيف؟ 1- الممرض. 2- طبيب العائلة.<br>45.3- هل كان هذا التثقيف ذو فائدة لك؟ 1- فائدة بسيطة. 2- فائدة متوسطة. 3- فائدة عظيمة. | |

| | |
|---|---|
| **-46** | هل حصلت على منشورات تثقيفية داخل المركز؟ 1- نعم 2- لا. |
| **-47** | هل تحدث معك مقدم الخدمة عن طبيعة الاكل او الحمية الخاصة بمرضى السكري؟ 1- نعم. 2- لا. 3- لا اعلم. |
| **-48** | هل تحدث معك مقدم الخدمة عن التدريبات الرياضية الخاصة بمرضى السكري؟ 1- نعم. 2- لا. 3- لا اعلم. |
| **-49** | هل نصحك مقدم الخدمة بالتوقف عن التدخين( اذا كنت مدخنا)؟ 1- نعم. 2- لا. 3- لا اعلم. |
| **-50** | اين تحتاج الى تثقيف صحي؟<br>1- الاكل الصحي. 2- اعراض انخفاض/ارتفاع السكر 3- الرياضة. 4- المتابعة.<br>5- طرق تقليل المضاعفات. 6- طرق اخد العلاج. 7- اخرى، حدد..... |
| **-51** | كيف تقيم فهمك للسكري؟ 1- جيد جدا. 2- جيد. 3- مقبول. 4- سيئ. |

**7- معلومات و سلوكيات مريض السكري.**

ملاحظة: مصطلح السكري يشير الى السكري من النوع الثاني.

| | **الاسئلة** | **نعم** | **لا** | **لا اعرف** |
|---|---|---|---|---|
| **-52** | اكل الكثير من السكر و الحلويات يسبب السكري. | | | |
| **-53** | إذا لم يعالج السكري، نسبة السكر في الدم تزداد. | | | |
| **-54** | اذا انا مريض سكري، اطفالي سيصابون بالمرض على الاغلب. | | | |
| **-55** | نسبة السكر الصائم في الدم 210 هي مرتفعة. | | | |
| **-56** | افضل طريقة لفحص السكر هي من البول. | | | |
| **-57** | التمارين الرياضية المنتظمة تزيد الحاجة للأنسولين و العلاج. | | | |
| **-58** | الادوية اهم من الحمية الغذائية و الرياضة للتحكم في السكري. | | | |
| **-59** | الجروح و الخدوش تشفى ببطء في السكري. | | | |
| **-60** | مرضى السكري يجب ان يكونوا حريصين عند تقليم اظافر قدمهم. | | | |

| | | | | | |
|---|---|---|---|---|---|
| **-61** | عدم انتظام السكر ممكن ان يؤذي الكلية. | | | | |
| **-62** | عدم انتظام السكر يؤدي الى عدم الاحساس بأصابع اليدين و القدمين. | | | | |
| **-63** | الارتجاف و التعرق من اعراض ارتفاع السكر في الدم. | | | | |
| **-64** | التبول الكثير و العطش من اعراض انخفاض السكر في الدم. | | | | |
| **-65** | الالبسة الضيقة و خاصة للقدمين غير ضارة بمرضى السكري. | | | | |
| **-66** | حمية مريض السكري تتكون من طعام خاص. | | | | |
| **-67** | اي من العبارات التالية تعبر عنك فيما يخص التمارين الرياضية؟(اذكر الكل)<br>1- انا حاليا لا امارس التمارين و لا انوي ممارستها في 6 شهور القادمة.<br>2- انا حاليا لا امارس التمارين و لكن انوي ممارستها في 6 شهور القادمة.<br>3- انا حاليا امارس التمارين و لكن ليس بانتظام.<br>4- في اخر 6 شهور بدأت في ممارسة التمارين بانتظام.<br>5- انا امارس التمارين بانتظام لفترة اطول من 6 شهور. | | | | |
| **-68** | اي من العبارات التالية تعبر عنك فيما يخص وزنك؟(اذكر الكل)<br>1- احاول بنشاط كسب الوزن. 2- احاول بنشاط عدم الزيادة في الوزن.<br>3- احاول بنشاط خسارة بعض الوزن. 4- لا اعمل شيئا بخصوص وزني. | | | | |
| **-69** | اي من العبارات التالية تعبر عنك فيما يخص اخذك لعلاج السكري؟(ادكر الكل)<br>1- اخد كل علاجي بانتظام و في الوقت المحدد. 2- اخد كل علاجي بانتظام و لكن احيانا انساه. 3- لا اخد علاجي بانتظام. | | | | |

**8- الجودة المدركة و رضى مريض السكري.**

الرجاء اختيار الرقم الذي يعبر موافقتك مع الجمل التالية. 1-غير موافق بشدة 2- غير موافق 3- محايد 4- موافق 5- موافق بشدة

| | الجملة | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **ا- الملموسات.** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **70** | مقدمو الخدمة انيقين و يرتدون الملابس المناسبة. | | | | | |
| **71** | المركز نظيف. | | | | | |
| **-72** | معدات المستعملة في خدمة مرضى السكري جيدة و حديثة. | | | | | |
| **-73** | المنظر الخارجي للمركز جذاب. | | | | | |
| **-74** | ساعات العمل مناسبة. | | | | | |
| **-75** | اخذ المواعيد سهل. | | | | | |
| **ب-التعاطف** | | | | | | |
| **-76** | مقدمي الخدمة مؤدبين و يتعاملون بأريحية مع المريض. | | | | | |
| **-77** | مقدمو الخدمة يعيرون اهتمامهم للمرضى. | | | | | |
| **-78** | مقدمو الخدمة يهتمون لمعتقدات و مشاعر المرضى. | | | | | |
| **-79** | مقدمو الخدمة يأخذون في حسابهم اهتمامات المريض. | | | | | |
| **-80** | مقدمو الخدمة يتفهمون احتياجات المرضى. | | | | | |
| **ج- الموثوقية.** | | | | | | |
| **-81** | يحترم مقدمو الخدمة المواعيد. | | | | | |
| **-82** | يقدمون الخدمة في الوقت المناسب. | | | | | |
| **-83** | يتعاملون مع كل اهتماماتك الصحية. | | | | | |
| **-84** | مقدمو الخدمة مستعدون للإجابة عن اي تساؤلات او استفسارات. | | | | | |
| **د- الاستجابة.** | | | | | | |
| **-85** | يستجيبون بكفاءة لاحتياجات المرضى الصحية. | | | | | |
| **-86** | يستجيبون بكفاءة لاحتياجات المرضى الغير الصحية. | | | | | |
| **-87** | دائما يرحبون بخدمتك. | | | | | |
| **-88** | يتفهمون الاحتياجات الخاصة لكل مريض. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **89-** | غير مشغولين للإجابة عن استفساراتك. | | | | | |
| **90-** | يعاملون جميع المرضى بالتساوي. | | | | | |
| **ه- الثقة.** | | | | | | |
| **91-** | يشجعون المرضى على الثقة بأنفسهم. | | | | | |
| **92-** | يجعلوك تشعر بالأمان. | | | | | |
| **93-** | يراعونك باستمرار. | | | | | |
| **94-** | يقدمون الخدمة التي تحسن حياتك اليومية. | | | | | |
| **95-** | يقدمون الخدمة التي تقلل من المك و شكواك. | | | | | |

**و- الرضى.**

ضع اشارة عند الرقم الدي يعبر عن مدى رضاك.

1- غير راضي بشدة 2- غير راضي 3-محايد 4- راضي 5- راضي بشدة

| | **ما مدى رضاك عن** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| **96-** | اخدك لمواعيد المتابعة. | | | | | |
| **97-** | وقت انتظار الخدمة في المركز. | | | | | |
| **98-** | صالة انتظار الخدمة في المركز. | | | | | |
| **99-** | الترحيب من قبل مقدم الخدمة. | | | | | |
| **100** | الوقت الذي قضاه مقدم الخدمة معاك. | | | | | |
| **101** | شرح مقدم الخدمة عن الخدمات الصحية الخاصة بالسكري المتوفرة. | | | | | |
| **102** | احترام مقدم الخدمة للخصوصية. | | | | | |
| **103** | طريقة تعليم و تثقيف مقدم الخدمة لك. | | | | | |
| **104** | مستوى رضاك العام عن الخدمة. | | | | | |
| **105** | كفاءة مقدم الخدمة بشكل عام. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **106** | مستوى رضاك العام عن الخدمة المقدمة من هذا المركز.. | | | | | |
| **107** | هل توصي بهده الخدمة لأقاربك و اصدقائك؟ 1- نعم 2- لا .لمادا..... | | | | | |
| **108** | هل تنوي الاستمرار في تلقي الخدمة من هذا المركز؟ 1- نعم 2- لا. | | | | | |
| **109** | هل انت راضي عن الخدمة التي تلقيتها اليوم؟ 1- الي حد كبير 2- غير متأكد. 3- غير راضي. | | | | | |
| **110** | هل تلبي الخدمة التي تلقيتها توقعاتك؟ 1- نعم. 2- الي حدا ما 3- لا. | | | | | |
| **111** | اذا لا، كيف تتوقع الخدمة ان تكون؟ 1- افضل. 2- اسوء. | | | | | |
| **112** | كيف تصف حالتك الصحية بعد تلقيك الخدمة من هذا المركز؟ 1- جيدة 2- نفس السابق. 3- اسوء 4- لا اعلم. | | | | | |

**Evaluation of Type 2 Diabetic Services at UNRWA Health Centers –**

**Gaza Governorate**

**Clients' Questionnaire**

**NCD file number** **HbA1c:** **Serial No:**

| **Part 1: Demographic data** | | |
|---|---|---|
| **1-** | Health center: 1- Jabalia 2- Sheikh Radwan 3- Deir Al-Balah 4- Maen 5- Naser 6-Rafah. | |
| **2-** | Place (by governorate): 1- North Gaza 2- Gaza 3- Deir Al-Balah 4- Khanyounis 5- Rafah | |
| **3-** | Age | ……Years |
| **4-** | Gender | 1- Male 2- Female |
| **5-** | What is your current marital status? 1- Married 2- Separated 3- Widowed 4- Single 5- Divorced | |
| **6-** | Years of completed education | ……Years |
| **7-** | Current working status? 1- Yes working 2- Not working 3- Retired. | |
| **8-** | If yes, what do you work? | ---------- |
| **9-** | What is the monthly income of your family (from all sources)……ILS | |
| **10-** | Do you smoke? 1- Yes, **If yes answer the questions 11 and 12** 2- No, I never smoked 3- ex-smoker | |
| **11-** | If you are currently smoking cigarettes, how many cigarettes do you smoke per day? --------- | |

| | | |
|---|---|---|
| **12.** | If you are smoking shisha, how many times do you smoke shisha per week----------- | |
| **13-** | What is the reason of your today's visit?<br>1- Scheduled appointed-follow up 2- Walk-ins- visit<br>3- To do laboratory tests 4- Refilling a prescription<br>5- Others, specify…….. | |
| **Part 2: Medical profile** | | |
| **14-** | How many years since were your diagnosis with DM II? | ……..Years |
| **15-** | With regard to your DM, do you receive health services from other providers than UNRWA?<br>1- Yes. 2- No. **Skip the below questions**<br>**15.1.** If yes, from which provider? (**could be more than one option**):<br>▪ Governmental center<br>▪ Non-governmental organization center<br>▪ Private center<br>▪ Other, specify----------<br>**15.2.** Why do you receive services from such provider? (**could be more than one option**):<br>▪ Better quality of provided services<br>▪ Availability of specialized services<br>▪ More convenient working hours<br>▪ Privacy maintenance<br>▪ Avoid waiting time | |

| | |
|---|---|
| | ▪ Trustful provider<br>▪ Closer to home<br>▪ Other, specify…… |
| **16-** | Do you have other chronic diseases? 1- Yes. 2- No<br>**16.1.** If yes, which diseases do you have (**could be more one option**)<br>- High blood pressure - Kidney disease - Heart disease<br>- Chronic Obstructive Pulmonary Diseases - Other, specify…….. |
| **Part 3: Accessibility** | |
| **17-** | Was it easy to reach the health center? 1- Yes 2- No<br>If no, why: - I come on foot and its take a long time<br>- I come by public transportation and it is cost money<br>- Others reasons, specify…. |
| **18-** | Is the health center adapted for people with disabilities?<br>1- Yes 2- No |
| **19-** | Generally, how many minutes do you wait to receive diabetes services from your nurse? ……Minutes |
| **20-** | Generally, how many minutes do you wait to receive diabetes services from your family doctor? ……Minutes |
| **21-** | How many minutes it generally takes you to receive the services? (From the moment you enter the center until you received all the services you want,) ……Minutes |
| **22-** | From your point of view, do you think the time consumed is? |

| | |
|---|---|
| | 1- Reasonable 2- Lengthy 3- Short |
| **23-** | Do the diabetic health services always available at the health center?<br>1- Yes. 2- No 3. Sometimes<br>If no, list the unavailable services:<br>□ Certain drugs — give example ----------<br>□ Specialized services — give example ----------<br>□ Laboratory tests — give example ----------<br>□ Other reasons specify ---------- |
| **24-** | Have the diabetes health services you received met your expectation?<br>1- Yes 2- No<br>If no, why, please specify…. |
| **25-** | What are the main challenges/barriers you face with regard to diabetic services you receive from this center?<br>1- Limited availability of diverse drugs (few options). 2- Crowdedness of the center 3- Lack of specialized services 4- Poor staff communication<br>5- Long waiting time 6- Short contact time with the provider<br>7- Infrequent appointments 8- Infrequent lab. analysis especially Hb1c<br>9- Others, specify….. |
| **26-** | In the past year, have you been returned home without receiving the services you came to receive? 1- Yes 2- No<br>If yes, indicate why ……. |
| **Part 4: Medical management of diabetes : Follow up care** | |
| **27-** | Do you regular conduct follow up visits? 1- Yes **Skip Q28** 2- No |

| | |
|---|---|
| | **If no, why?**<br>▪ I cannot afford transportation cost<br>▪ My movement is uneasy<br>▪ I do not have time—work issues-leave<br>▪ I am not welcomed by staff<br>▪ I do not trust my provider<br>▪ The providers are not qualified enough to deal with my case<br>▪ I need someone to accompanied me<br>▪ Others, specify…….. |
| **28-** | Have you been approached by provider because you did not follow up regularly?<br>1- Yes 2- No |
| **29-** | Do you measure/monitor your blood sugar level at this health center?<br>1- Yes, **skip question 30** 2- Sometimes 3- No |
| **30-** | If you measure your blood sugar outside this center, why you do so?<br>1- To monitor my blood sugar level at evenings/nights when the health center is closed<br>2- I do not trust the center lab 3- To save time 4. To confirm results of this center lab 5- Others, specify….. |
| **31-** | Do you have glucometer at home? 1- Yes 2- No, **skip question 32** |
| **32-** | If you have, can you afford regularly buying strips for it?<br>1- Yes 2- No 3. Sometimes |
| **Part 5: Diabetes complications screening within UNRWA clinics (last year)-** | |
| **33-** | Have you done an eye exam last year? 1- Yes 2- No. **skip questions 34, 35, and** |

| | | |
|---|---|---|
| | **36**. | |
| **34-** | If yes, when it was? | Before ……..Months. |
| **35-** | Have you received a feedback about that eye exam? 1- Yes 2- No, **skip question 36** | |
| **36-** | If the eye exam result was positive, did it have effect on your diabetic management plan?<br>1- Yes 2- No 3. Do not know | |
| **37-** | Have you done a foot exam last year? 1- Yes 2- No. **skip questions 38, 39 and 40** | |
| **38-** | If yes, when it was? | Before ……..Months. |
| **39-** | Have you received a feedback about that foot exam? 1- Yes. 2- No. **skip question 40** | |
| **40-** | If the foot exam result was positive, did it have effect on your diabetic management plan?<br>1- Yes 2- No 3. Do not know | |
| **41-** | Have you done your annual laboratory analysis last year?<br>1- Yes 2- No. **skip questions 42, 43 and 44.** | |
| **42-** | If yes, when it was? | Before ……..Months. |
| **43-** | Have you received a feedback about the results of annual laboratory analysis?<br>1- Yes 2- No, **skip question 44** | |
| **44-** | If the annual laboratory analysis result was positive, did it have effect on your diabetic management plan? 1- Yes 2- No | |
| **Part 6: Diabetes health education** | | |

| | |
|---|---|
| **45-** | Have you received health education about diabetes inside the health center before?<br><br>1- Yes 2- No. **Go to question 46**<br><br>**45.1.** If yes, when? (**unprompted - more than one option**)<br><br>1- At the time of diagnosis of my diabetes only 2- Regularly, every follow up visit<br><br>3- Irregularly, during the follow up visits<br><br>**45.2.** If yes, from by whom? 1- Nurse 2- Family doctor<br><br>**45.3.** If yes, how do you judge the benefits of the health education you received?<br><br>1- Not beneficial 2- Beneficial- to some extent 3- Beneficial to large extent |
| **46-** | Have you received any health educational materials about diabetes during your visits to this health center in the last year?<br><br>1- Yes 2- No |
| **47-** | Have the service providers ever talked to you about your diet or eating habits in the last year? 1- Yes 2- No 3- I don't know |
| **48-** | Have the service providers ever talked with you about physical activity or exercise in the last year?<br><br>1- Yes 2- No 3- I don't know |
| **49-** | Have the service providers ever advised you to quit smoking (if you are smoker) within last year? 1- Yes. 2- No. 3- I don't know |
| **50-** | In what areas of diabetic management do you feel the need of health education?<br><br>1- Diet 2- Low and high signs and symptoms of high blood sugar level<br><br>3- Exercise 4- Diabetes follow up 5- Diabetes complications<br><br>6- Taking medication 7- Others, specify…… |
| **51-** | How would you rate your understanding of your disease?<br><br>1- Excellent 2. Good 3- Fair 4- Poor |

| **Part 7: Patient's Knowledge and practice** | | | | |
|---|---|---|---|---|
| | Questions | Yes | No | Don't know |
| **52-** | Eating too much sugar and other sweet foods is a cause of type 2 DM | | | |
| **53-** | In untreated type 2 DM, the amount of sugar in the blood usually increases | | | |
| **54-** | A fasting blood sugar level of 210 is too high | | | |
| **55-** | The best way to check your sugar is by testing urine | | | |
| **56-** | Regular exercise will increase the need for insulin or other diabetic drugs | | | |
| **57-** | Medication is more important than diet and exercise to control blood glucose level | | | |
| **58-** | Cuts and would heal more slowly among diabetic clients | | | |
| **59-** | Diabetic clients should be very careful when cutting their toenails | | | |
| **60-** | The way you prepare your food is as important as the food you eat | | | |
| **61-** | Uncontrolled type 2 DM can cause renal impairment | | | |
| **62-** | Uncontrolled type 2 DM can cause loss of sensations (hands, fingers and feet) | | | |
| **63-** | Shaking and sweating are signs of high blood sugar level | | | |
| **64-** | Frequent urination and thirst are signs of low blood sugar level | | | |
| **65-** | Tight elastic shoes or socks are appropriate for type 2 DM | | | |

| | | | | |
|---|---|---|---|---|
| **66-** | A diabetic diet consists mostly of special foods | | | |
| **67-** | Which one of the following statements about exercise applies to you? (**Read all**)<br>1- I currently don't exercise and don't intend to start regular exercise in the next 6 months<br>2- I currently don't exercise but I intend to start regular exercise in the next 6 months<br>3- I currently exercise but not regularly<br>4- In the last 6 months I started to exercise regularly<br>5- I currently exercise regularly and I have done so far longer than 6 months | | | |
| **68-** | Which of the following statements describe your actions toward your weight at the moment? (**Read all**)<br>1- I am actively doing things to try to gain weight at the moment<br>2- I am actively doing things to try to avoid gaining weight at the moment<br>3- I am actively doing things to try to lose weight at the moment<br>4- I am not doing at things in particular for my weight at the moment | | | |
| **69-** | Which of the following statements describe your anti-diabetic drugs administration? (**Read all**)<br>1- I take all my medication regularly and on time<br>2- I take all my medication regularly but sometimes I forget to take it<br>3- I don't take my medication regularly | | | |
| **Part 8: Patient Perceived Quality and Satisfaction.**<br>Note: the term "services" is referred to diabetes type 2 health care services provided at UNRWA health centers.<br>For each of the below statement, please select one of the five options statement: | | | | |

| 1=Strongly disagree 2= Disagree 3-Natural 4=Agree 5=Strongly agree | | | | | | |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** |
| **A- Tangibles** | | | | | | |
| **70-** | The service providers are well dressed and appear neat | | | | | |
| **71-** | The health center is clean | | | | | |
| **72-** | The health center is equipped with modern and up-to-date equipment | | | | | |
| **73-** | The physical appearance of the health center is visually appealing and attractable | | | | | |
| **74-** | The center operating hours are convenient to you | | | | | |
| **75-** | Booking an appointment is easy | | | | | |
| | **B- Empathy** | | | | | |
| **76-** | Health providers are polite and deal with clients in a friendly way | | | | | |
| **77-** | Health providers pay attention to their patients | | | | | |
| **78-** | Health providers pay attention to the patient's beliefs and emotions | | | | | |
| **79-** | Health providers take into account their clients interest | | | | | |
| **80-** | Health providers understand the needs of their patients | | | | | |
| **C- Reliability** | | | | | | |
| **81-** | Health providers respect patients appointments | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **82-** | Health providers provides you with the appropriate timely services | | | | | |
| **83-** | Health providers address all your concerns | | | | | |
| **84-** | Health providers response to your questions and requests | | | | | |
| **D- Responsiveness** | | | | | | |
| **85-** | Health providers promptly respond to your health needs | | | | | |
| **86-** | Health providers promptly respond to your non-health needs | | | | | |
| **87-** | Health providers are always willing to help you | | | | | |
| **88-** | Health providers understand the specific needs of clients | | | | | |
| **89-** | Health providers are never too busy to respond to your request | | | | | |
| **90-** | Health providers treat all diabetic patients equally | | | | | |
| **E- Assurance** | | | | | | |
| **91-** | Health providers promote your self-confidence | | | | | |
| **92-** | Health providers make you feel safe | | | | | |
| **93-** | Health providers are consistently considerate with you | | | | | |
| **94-** | Health providers provide you with services that improve the activity of your daily living | | | | | |
| **95-** | Health providers provided you with services that alleviate your symptoms | | | | | |

| For each of the below statement, please select one of the five options: 1=Strongly dissatisfied 2= Dissatisfied 3-Natural 4= Satisfied 5=Strongly satisfied | | | | | | |
|---|---|---|---|---|---|---|
| **F- Satisfaction** | | | | | | |
| **96-** | Making appointment for follow up visits | | | | | |
| **97-** | Waiting time | | | | | |
| **98-** | Convenience of the waiting area | | | | | |
| **99-** | Welcoming and greeting of service providers | | | | | |
| **100** | The time that the health providers spent with you | | | | | |
| **101** | The services providers' explanations about diabetic services | | | | | |
| **102** | The services providers' respect of your privacy | | | | | |
| **103** | The way services providers teach you about improving your health | | | | | |
| **104** | The overall health services you received from your providers | | | | | |
| **105** | The performance of health providers all . | | | | | |
| **106** | You general satisfaction about the diabetes services that have been provided from the health center | | | | | |

| | |
|---|---|
| **107** | Would you recommend UNRWA diabetes services to any of your relatives and friends?<br><br>1- Yes 2- No, If no, why? ---------- |
| **108** | Do you intend to continue receiving the services from this center? 1- Yes. 2- No. |
| **109** | How satisfied are you with the services received today?<br><br>1- To high extent 2- uncertain 3- Not satisfied |
| **110** | Have diabetes services that you received today met your expectations?<br><br>1- Yes 2- Some extent 3- No |
| **111** | If no, how did you expect the services to be? 1- Better 2- Worse |
| **112** | How do you describe your health status after receiving services from this center?<br><br>1. Good 2- The same. 3- Getting worse 4. I do not know |

## Annex (5): Focus groups interviews questions and consent form

**نموذج موافقة**

عزيزي/تي المشارك/ة

أنا الطالب/ اسامة عبد القادر حماد، ملتحق ببرنامج ماجستير الصحة العامة - تخصص إدارة صحية بجامعة القدس.

إنه لمن دواعي سروري أن تكون أحد المشاركين في هذه الدراسة والتي تهدف إلى **تقييم الخدمات المقدمة لمرضى السكري النوع الثاني في مراكز الصحة التابعة لوكالة الغوث الدولية- محافظات غزة**، مما يساهم في تحسين هذه الخدمات.

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

أخي/ أختي المشارك/ة: سيقوم الباحث بإجراء جلسة مناقشة جماعية لمقدمي خدمة العلاج الطبيعي و في حال أبديت الموافقة للمشاركة في هذه الدراسة عليك المشاركة في المناقشة و الاجابة على الاسئلة المطروحة، مع العلم بما يلي:

- مشاركتك في هذه الدراسة طوعية، ويحق لك القبول أو الرفض أو حتى الانسحاب في أي وقت
- ستحتاج المناقشة حوالي 30 دقيقة.
- لا يوجد إجابات صحيحة و أخرى خاطئة.
- سيتم تدوين ما يقال في النقاش.
- السرية مكفولة و لن يتم ذكر أي اسم من أسماء المشاركين.

**شكرا لتعاونك**

**مع فائق الاحترام والتقدير**

**الباحث: اسامة عبد القادر حماد**

**كلية الصحة العامة**

**جامعة القدس**

## Questions to Key provider

1. Compared with other diabetic health service providers? What makes you special?

**Probing questions**

- Cost of services
- Quality of care
- Qualified staff

2. Do you have written protocols and technical instructions related to DM II?

**Probing questions**

- Do you have access to such protocols, if available?
- Do you think your colleagues fully applying the written protocols, full compliance?
  - If no, why
  - If sometimes, why not all the time
- Have you received training on those protocols?
- Are these protocols up-to-date?
- If you have the option, what could you add to the current protocol?

3. From your perspective, to what extent did you think that you have the appropriate knowledge and skills necessary to manage diabetic clients?

**Probing questions**

- To large extend, explain?
- Not at all, why?

4. From your perspective, to what extent did you think that you have the appropriate experience necessary to manage diabetic clients?

**Probing questions**

- To large extend, how?
- Not at all, why?

5. From your perspective, how do you evaluate the contact time with your clients?

**Probing questions**

- Short, consequences, why it is short
- Do you recommend certain contact time?
  - What could be done to achieve this contact time
  - What are the barriers that prevent you from achieving the recommended contact time

6. What do you think of the current appointment systems?

**Probing questions**

- Efficient/effective, explain why
- What could be done to improve the efficiency of the system?

7. Do you have in-service training programme related to DM management?

**Probing questions**

- If yes, how often do they offer trainings
- What topics were covered before?
- What trainings you wish to have?
  - Life-style
  - Dietary instruction for diabetic clients
  - Consequences of DM
  - Self-care of diabetic clients

8. How do you evaluate the quality of provided services?

**Probing questions**

- Of good quality, why?
- Of reasonable quality, why?
- Are you satisfied with the quality of provided services?
- What could be done to improve the quality of services?

9. From your view, what are the main barriers that prevent clients from utilizing your services?

**Probing questions**

- Distance to clinic
- Cost
- Work schedule
- Waiting time
- Limited availability of services

10. Do you have other questions?

Thanks a lot for your time and efforts

## Annex (6): Experts and professional consulted

The study tool (interviewed questionnaire) was reviewed and evaluated by the following experts:

Dr. Bassam Abu Hamad, Al Quds University

Dr. Yehia Abed, Al Quds University

Dr. Ghada Al Jadba, UNRWA, Health Program

Dr. Issa Saleh, UNRWA, Health Program

Dr. Zoheir El khatib, UNRWA, Health Program

Mr. Jehad Okasha, Palestinian Ministry of Health

Dr. Ashraf Aljedi, Islamic University of Gaza

Dr. Mahmoud Shaker, UNRWA, Health Program

Dr. Akhiro Sitta, UNRWA, Health Program

**عنوان الدراسة: تقييم الخدمات المقدمة لمرضى السكري النوع الثاني في مراكز الصحة التابعة لوكالة الغوث الدولية- محافظات غزة**

**إعداد: أسامة عبد القادر حماد**

**إشراف: د. ختام أبو حمد**

**ملخص الدراسة**

الأمراض غير المعدية هي من بين الأسباب الرئيسية للوفيات والممراضة على مستوى العالم و أحد اهم هذه الأمراض هو مرض السكري من النوع الثاني.

في قطاع غزة ، تعد وكالة الأمم المتحدة لإغاثة وتشغيل اللاجئين الفلسطينيين في الشرق الأدنى (الأونروا) واحدة من مقدمي الخدمات الصحية الرئيسيين للأمراض غير المعدية ، بما في ذلك مرض السكري من النوع الثاني.

تهدف هذه الدراسة إلى تقييم الخدمات المقدمة لمرضى السكري من النوع الثاني في المراكز الصحية التابعة للأونروا في قطاع غزة لاقتراح توصيات لتحسين جودة هذه الخدمات.

تم تصميم هذه الدراسة بطريقة مختلطة، اي انها تنطوي على كل من دراسة كمية ونوعية. تم جمع البيانات الكمية من المستفيدين الذين استخدموا الخدمات الصحية المقدمة لمرضى السكري من النوع الثاني في المراكز الصحية التابعة للأونروا، في المجموع ، شارك 408 مريضا في الدراسة الكمية. أما الدراسة النوعية، تم جمع البيانات من خلال اربع مجموعات نقاش مركزة مع مقدمي الرعاية الصحية لمرضى السكري (الأطباء والممرضات). تم إجراء تحليل البيانات الكمية باستخدام برنامج SPSS ، وشمل التحليل أنواعًا مختلفة من الاختبارات الإحصائية. بالنسبة للبيانات النوعية ، تم استخدام طريقة الترميز المفتوح الموضعي التحليلي.

أظهرت النتائج أن 99 ٪ من المشاركين في الدراسة تلقوا خدمات الرعاية الصحية للنوع الثاني من مرض السكري حصرا من الأونروا ، وكان 72.1 ٪ يعانون من مرض مصاحب آخر ، وخاصة ارتفاع ضغط الدم. وكان المشاركون على معرفة جيدة بداء السكري من النوع الثاني بواقع 76.87 ٪. حوالي 89٪ لديهم سهولة الوصول إلى هذه الخدمات. و ايضا وافقت هذه الخدمات توقعات 95.8 ٪ من المشاركين.

كانت العوائق الرئيسية أمام خدمات الأونروا لمرضى السكري من النوع الثاني من وجهة نظر المشاركين هي فترة الانتظار الطويلة لتلقي الخدمة (77.4٪) وتكدس المركز الصحي (40.2٪).

ما مجموعه 74 ٪ من المشاركين في الدراسة لم يتلقوا أي نوع من التثقيف الصحي عن الرعاية الذاتية لمرضى السكري من النوع الثاني ، وقد كان معظم هذا التثقيف الصحي عن طريق الممرضين (85.8 ٪). قام حوالي 95٪ من المشاركين في الدراسة بعمل زيارات متابعة منتظمة للمراكز الصحية التابعة للأونروا ، وكانت الأسباب الرئيسية لعدم انتظام زيارات المتابعة هي انشغال المريض (65٪)، تليها عدم القدرة البدنية على الحركة للوصول للمركز الصحي (30٪).

بالنسبة لفحص مضاعفات مرض السكري ، أجرى 62.5٪ من المشاركين فحص العين السنوي، وقام 73.8٪ من المشاركين بفحصهم للقدم و 93.6٪ من المشاركين قاموا بعمل التحاليل المخبرية السنوية.

أدرك المشاركون في الدراسة أن الخدمات الصحية المقدمة من الأونروا للنوع الثاني من مرض السكري كانت ذات جودة عالية بنسبة 87.43 ٪ ، ورضى بنسبة 84.07٪. كانت الجودة المدركة بشكل عام ذات دلالة إحصائية مرتبطة بمكان المشاركين وجنسهم وحالة التدخين.

وفقًا لمخزون السكر HbA1c ، كانت النسبة المئوية لانتظام مرضى السكري من النوع الثاني الذين لديهم مخزون السكر اقل أو يساوي 7٪هو 23.8٪ والباقي غير منتظم. وارتبط مستوى HbA1c إحصائيا بشكل كبير مع جنس المشاركين وحالة التدخين.

وخلصت الدراسة الحالية إلى أنه على الرغم من النتائج الجيدة لكل من الجودة المدركة ، فحوصات مضاعفات داء السكري من النوع الثاني ومعرفة المرضى بداء السكري من النوع الثاني ، إلا أن السيطرة على نسبة مخزون السكر في الدم بواسطة HbA1c ضعيفة. يمكن تفسير ذلك من خلال التركيز غير الكافي على التثقيف الصحي ،محدودية الرعاية الذاتية الصحية لمرضى السكري ، التواصل المحدود بين مقدم الرعاية الصحية والمرضى و أيضاً وقت اتصال قصير للغاية بينهم.

هناك حاجة إلى مزيد من الدراسات لمعرفة محددات انتظام مرض السكري من النوع الثاني و أيضاً تحتاج الأونروا إلى إيجاد طرق لزيادة وقت الاتصال بين مقدم الخدمة و مريض السكري و أخيراً إلى تحسين جودة الخدمات المقدمة من خلال تعزيز المراقبة والإشراف.