Majed S. S. Abuawad

Assessing quality of life of Palestinian diabetic patients; refugees and non-refugees

UNRWA and MOH health centers attendants

Abstract

Background: *Diabetes Mellitus (DM) negatively affects quality of life (QOL). QOL of diabetic patients has not been reported previously. However, previous international studies have shown that QOL is related to socioeconomic status (SES) as well as to other factors including provision of health care. The purpose of this study was to assess the impact of DM on the health-related quality of life (HRQOL) of diabetic patients.*

Material/Methods: *A sample of 140 diabetic patients (100 refugees and 40 non-refugees) treated in Ministry of Health (MOH) & United Nations Relief and Work Agency (UNRWA) health facilities were recruited. Participants were given the World Health Organization quality of life questionnaire-short version (WHOQOL-BREF). HRQOLs were acquired to assess QOL domains that included physical and psychological health, social relationships, and environmental domains. Means, standard deviations, and statistical tests for differences were performed to compare between HRQOL and socio-demographic and health-related factors, (gender; age; education; employment, income, refugee status and marital status; duration of the disease; treatment method; complications).*

Results: *The result revealed that gender had no significant impact on HRQOL. Non-refugees had lower scores than refugees in all domains of QOL. Low SES had a strong negative impact on HRQOL of diabetic patients. The impact of DM on HRQOL was especially severe among older subjects (above 60 years). Patients who were on oral hypoglycemic agents (OHAs) only had a better HRQOL than who were on insulin, but this difference did not reach the significant level. Longer duration of DM (> 10 years), and presence of one or more DM complications had strong negative impact on HRQOL than diabetic people who had no or less DM complications.*

Conclusions: *This study shows diabetes impacts the lives of diabetic patients in multiple areas. DM disease has negative impact on HRQOL. HRQOL is strongly reduced among non-refugees diabetics attended MOH clinic than refugees diabetics who attended UNRWA clinic. Thus, health care providers, particularly MOH health care providers must address its social consequences.*

Acknowledgements

List of abbreviations

ADA	American Diabetes Association
ANOVA	Analysis of Variance
CAD	coronary artery disease
DFUs	Diabetic Foot Ulcers
DM	Diabetes Mellitus
GDP	Gross Domestic Product
HRQOL	Health-Related Quality of Life
MCH	Mother and Child Health
MOH	Ministry Of Health
NCDs	Non-Communicable Diseases
NDIC	National Diabetes Information Clearing house
NGOs	Non-Governmental Organizations
NHP	Nottingham Health Profile
OHAs	Oral Hypoglycemic Agents
PA	Palestinian Authority
PCBS	Palestinian Central Bureau of Statistics
PDN	Painful Diabetic Neuropathy
PHC	Primary Health Care
PMMS	Palestinian Military Medical Services
PSN	Peripheral Sensory Neuropathy
PT	Palestinian Territory
PVD	peripheral vascular disease
QOL	Quality of Life
SA	Standard Deviation
SES	Socioeconomic Status
SPSS	Statistical Package for Social Sciences
UNRWA	United Nations Relief and Work Agency
WFP	World Food Programme
WHO	World Health Organization
WHOQOL- BREF	World Health Organization Quality of Life – short version

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Abstract

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Chapter 1: Introduction

1.1 Research background

Diabetes Mellitus (DM) type II accounts for approximately 90 percent of all cases of DM diagnosed in older individuals worldwide. Type II DM is a global epidemic and one of the major public health challenges of the 21st century. The World Health Organization (WHO) deems the prevention, diagnosis, and treatment of type II DM a priority (WHO 2008). An estimate of the global increase in the number of people who develop DM suggests that the number will double from 151 million in 2000 to 300 million by 2025. While the numbers of type II DM cases are expected to rise in every country worldwide, the greatest increases are expected in developing countries (Zimmet et al. 2003). Today most people with DM live in low- and middle income countries and this proportion will increase to 75% by the year 2025 (Lindstrand et al. 2006).

DM is estimated to be the seventh leading cause of death, the risk for premature death among people with DM is about two times higher than people without DM (Lindstrand et al. 2006). In the U.S., 25.8 million people of all ages, represents about 8.3 percent of the population. DM total cost in the U.S. for 2012 was 174 billion: 116 billion direct medical costs and 58 billion related to disability, work loss and premature mortality (NDIC 2012). The increasing prevalence of type II DM has placed enormous financial demands on the U.S. health care system (CDC 2007).

In Palestine, the estimated prevalence rate of DM was 9·0% in adults aged 30 years and older. Routine data gathered by the United Nations Relief and Works Agency (UNRWA) showed that the prevalence rate was 10·5% in the West Bank and 11·8% in the Gaza Strip among the registered Palestinian refugees aged 40 years and older. A study has shown also DM constituted 3.6% of total population deaths and the average annual mortality rate of DM was 12.4 Per 100,000 populations in the last 5 years (Husseini et al. 2009).

People who are diagnosed with DM have to deal with a complex package of self-care tasks in order to control the disease and prevent complications. According to the American Diabetes Association (ADA), some of these tasks include nutritional therapy, physical activity, glucose monitoring, administering daily medications and continuous medical follow ups.

Several DM complications include heart disease and stroke, kidney disease, neuropathy, foot amputations, dental disease and retinopathy that may lead to blindness (NDIC 2012). These could decrease productivity level and increase work absenteeism, the rate of health care utilization and patients' and governments' medical expenses because health care needs at individual and community levels are high (Disdier et al. 2001).

Public health concern is growing in both developed and developing countries. DM is known to strongly affect the Health-Related Quality of Life (HRQOL) which is influenced by living conditions as well. Although it is well documented that DM is strongly associated with morbidity and mortality, less is known about how this disease affects functional health status and sense of wellbeing and the Quality of Life (QOL) (Wee et al. 2005). In a population-based Dutch study diabetic patients without complications had only slightly lower QOL than age matched persons in the general population (Redekop et al. 2002).

Coping with DM in everyday life is a big challenge, thus as already stated DM is incurable chronic disease. QOL is directly linked and influenced by subjects like personal problem solving mechanisms, treatment methods and perceptions of problem areas, namely emotional materials (Pereira et al. 2009). Individuals with type II DM face a decline in QOL as well as the economic costs of managing this incurable disease. In summary DM is a chronic, life-threatening disease that affects patients' and their families' QOL and increases the patients' and governments' medical expenses.

1.2 Research problem

DM is a serious disease and a cause for a growing public health concern in both developed and developing countries. DM is an incurable chronic disease that patients live with their whole life; its complications are usually serious and problematic. There is rapid increase in prevalence of DM globally and especially among Palestinians. In Gaza Strip, the prevalence of DM was estimated at 11% in the rural and 14% in the urban population of the West Bank, the prevalence of complications of DM in this population is high.

There are several studies have demonstrated that DM has a strong negative impact on the HRQOL, especially in the presence of complications. Most of health care interventions are only concerned with eradication of symptoms and attempts to delay complications as much as

possible. Health care is essentially a humanistic transaction where the patient's well-being is a primary aim, therefore attention should be focused on QOL aspect of health from the need for commitment to the continued promotion of an holistic approach to health and health care, as emphasized in the WHO definition of health as "A state of physical, mental and social well-being, not merely the absence of disease and infirmity". This study focused in assessing the HRQOL of refugees and non-refugees diabetic patients.

1.3 Justification of the study

DM and its complications contribute significantly to ill health, disability, poor QOL and premature death. Additionally, DM is a contributing factor to several other causes of morbidity and mortality. The increasing figures of the Palestinian refugees who are suffering from DM and the associated complications are in need for special efforts to understand how DM affects their daily lives and how the difficult conditions of their refugee life affect the management of DM.

This study identified the important variables needed to establish the basis for future research among diabetic patients. It also expanded the limited knowledge about the Palestinian diabetic patients and how they define and manage their DM, and how this affects their HRQOL. The results of this study will improve provision of adequate care and focus on holistic medical interventions for diabetic patients based on their perceived needs.

Few data exist and few previous studies have been identified in the literature about the QOL of the diabetic patients in Gaza Strip. The findings will be used as a basis for suggesting measurements of diabetes quality of care improvements, and determining important variables that influence implementation of successful control and good self-management of DM and consequently increase HRQOL.

1.4 Overall objective

The overall goal of this study was to assess the HRQOL of the Palestinian refugees and non-refugees diabetic patients attended Ministry of Health (MOH) and UNRWA clinics in the Gaza Strip. Therefore, the study aimed to illustrate how the Palestinians manage their DM and their daily activities under such sociopolitical situation.

1.5 Specific objectives

1. To assess the perceived QOL among refugees and non-refugees diabetic patients.
2. To compare the QOL of diabetic patients who are on insulin and non-insulin based treatment.
3. To assess whether or not the QOL measure is related to socioeconomic status (SES) of diabetic patients.
4. To correlate the relationship between duration of the disease and the patients' QOL.
5. To examine the association between the QOL and DM complications.

1.6 Research questions

1. To what extent diabetic patients perceive their QOL?
2. What is the impact of insulin therapy on the patients' QOL?
3. Is there any relationship between SES factors and diabetic patients' QOL?
4. What is the impact of disease duration on patients' QOL?
5. How do DM complications affect the QOL of diabetic patients?

1.7 Context of the study

In this section the researcher presented background information about the Palestinian population, demography, Gaza Strip, socio-economy and political situation we live in Gaza Strip, that may force us to provide health services which suit these situations.

1.7.1 Demographic context

Demographics consider is an important issue in development of Palestine especially in the scarceness of resources. Historical Palestine constitutes the southwestern part of a huge geographical unity in the eastern part of the Arab world; it is about 27,000 Km^2. Now, Palestine comprises two areas separated geographically: West Bank and Gaza Strip the total area of occupied Palestinian Territories (PT) is 6,020 Km^2; with total population living in are 4.420.549 individuals. West Bank is area of 5,655 Km^2, divided into four geographical regions. The population density is 420 inhabitants/ Km^2 (PCBS 2013).

There were 2.7 million Palestinians live in West Bank and 1.7 million live in Gaza Strip at the end of 2012, 61.6% against 38.4% respectively. The population density is 3988 inhabitants/km2

mainly concentrated in the cities, small village, and eight refugee camps, (PHIC 2005).There were 328 thousands live in North Gaza and they reach 7.5% from the total percent of PT population and around 17% of the population of Gaza Strip. At the end of 2012 there were 2.21 million males compared to 2.14 million females in PT. There were 850 thousand males and 823 thousand females in Gaza Strip by sex ratio of 103.2.

In the PT the percent of aged people 60 and above reached 4.4% of the population 4.8% in West Bank and 3.7% in Gaza Strip. As a result of the decrease in the mortality rate in the PT, the life expectancy for individuals has increased to 72.1 years, 70.7 for males and 73.5 for female in Gaza Strip (PCBS 2013). The life expectancy increased 5-7 years during the last 2 decades, and it increased from 67 years in 1992 to 71.3 years for males and to 74.1 years for females, it supposed to reach72 years and 75 years respectively in 2015, this increasing in life expectancy will result in rising of number of aged people in PT.

1.7.2 Gaza Strip

Gaza Strip located on the south of Palestine on the eastern coast of Mediterranean sea, and it considers as one of the highest crowded areas in the world, where 1.7 million Palestinians live in Gaza Strip, more than half of this total number are refugees with percent reaches 67.4% (PHIC 2012; PCBS 2013). Gaza Strip is one of the territorial units forming the Palestinian Authority (PA) territories and comprises a narrow zone of land, 45 kilometers long, 7.9 kilometers wide at its northern end, 12.5 kilometers wide at its southern end, and 5.5 kilometers wide at its narrowest point, the total are estimated about 365 square kilometers and constitute 6.1% of total area of PT land. Gaza Strip is dividing into five governorates that are, North Gaza, Gaza, Middle Zone, Khan Yonis and Rafah (PCBS 2013).

1.7.3 Health system context

Health care providers in Gaza Strip divided into 5 sectors and they are: MOH, UNRWA, Non-Governmental Organizations (NGOs), Palestinian Military Medical Services (PMMS), and private for profit. These sectors provide primary, secondary and some tertiary health care services. These Primary Health Care (PHC) centers are classified from level I to IV and they offer different health services according to clinic level (PHIC 2011).

1.7.4 PHC in Gaza Strip

PHC is one of the most important components of the Palestinian health care system. PHC centers provide accessible and affordable health services for all Palestinians, especially for children and other vulnerable groups. Management services for Non-Communicable Diseases (NCDs) care are integrated within the PHC centers at MOH & UNRWA centers (PHIC 2005).

UNRWA health centers provide health services free for all eligible registered refugees including NCDs management at PHC level. MOH centers provide health services for NCDs patients who have valid health insurance.

The total number of registered PHC centers in Palestine is 748 centers, 147 centers in Gaza Strip. Distribution by provider shows that, there are 54 centers owned and supervised by the MOH, 20 centers by the UNRWA and NGOs have 66 centers (PHIC 2011).

According to MOH, PHC centers are classified into four levels, from the 54 PHC centers there are 29 centers offer secondary health care services, 16 centers for rehabilitation services, and 9 centers have provided fourth level services. These centers offer different health services according to the level of the clinic including Mother and Child Health (MCH) care, family planning, dental, mental services and others (PHIC 2011).

1.7.5 Socio-economic situation

The Palestinian economy is severely depressed compared with the pre-intifada period. The World Bank estimates that Gross Domestic Product (GDP) is 23 % lower than in 1999. After accounting for population growth, real GDP per capita is some 35 percent below its pre-intifada level (World Bank 2004). The PA's fiscal situation has become increasingly unsustainable mainly as a result of uncontained government consumption, in particular a rapidly increasing public sector wage bill, expanding social transfer schemes and rising "net lending". In addition, the depressed economy led to lower tax revenues level (World Bank 2006).

1.7.6 Political situation

Gaza Strip has been subjected to long term recurrent occupations. This very long periods of occupation resulted in increasing the socio-economic and health vulnerability of the Palestinian population. The implementation of the partial autonomy in 1994 and the establishment of the PA have had its impacts on the society after the many devastating wars and the long years of

occupation and dispersion over the globe. However, Israel still holds overall sovereignty over the Gaza Strip. It has the upper hand over borders, movement of goods and travelers in and out of Gaza, (Hamad 2009). After June 2007, tight siege was imposed on Gaza and the Israeli policy sought to ensure no development, no prosperity (WFP 2007).

1.8 Operational definition of terms

QOL: WHO's definition of QOL which identifies it as a multidimensional concept and defines it as "individuals' perceptions of their position in life in the context of the culture and value system in which they live and in relation to their goals, standards, and concerns" (WHO 1993).

DM: WHO (1999) defined the DM as a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both.

UNRWA: The United Nations Relief and Works Agency for Palestine Refugees in the Near East was established in 1949 to carry out direct relief and works programs for Palestine refugees. UNRWA is the main provider of basic services - education, health, relief and social services - to over 4.1 million registered Palestine refugees in the Middle East.

Palestine refugees: UNRWA defined Palestine refugees as people whose normal place of residence was Palestine between June 1946 and May 1948, who lost both their homes and means of livelihood as a result of the 1948 Arab-Israeli conflict. People who are not defined refugees in accordance with this definition, they are not refugees and thus they are not included in UNRWA register.

Chapter 2: Theoretical framework

WHO defines QOL as the individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (WHO 1997). This global definition encompasses six dimensions of QOL that are: physical health, psychological state, level of independence, social relationships, personal beliefs and people's relationship to salient features of their environment. Most conceptualistic models of HRQOL include the dimensions of physical, social and role functioning, in addition to mental health and general perceptions of health (Wilson and Cleary 1995).

These dimensions impinge on each other, and they are affected by the patient's personality characteristics, social support, economical support, and non-medical factors, such as political and cultural factors (Wilson and Cleary 1995). For the purpose of this study, the author used two theoretical models, which complemented each other. These two models are: Ferrans's Model, 1990b and Zhan's Model, 1992.

It is obvious from the two models that QOL is a multidimensional concept, which describes several dimensions like: physical, socioeconomic, psychological, and spiritual. Both models have connected the definition of QOL with the concept of the satisfaction. Moreover, the two models stress the importance of the interaction of the individual with his environment as a source of better QOL satisfaction or dissatisfaction. Based on these two models and the WHO's definition of QOL, the researcher has chosen the World Health Organization Quality of Life- short version (WHOQOL-BREF) instrument to assess and evaluate the QOL among the Palestinian diabetic patients. WHO defined QOL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, and concerns". This definition is greatly consistent with the definitions of QOL in the Ferrans's and Zhan's Models.
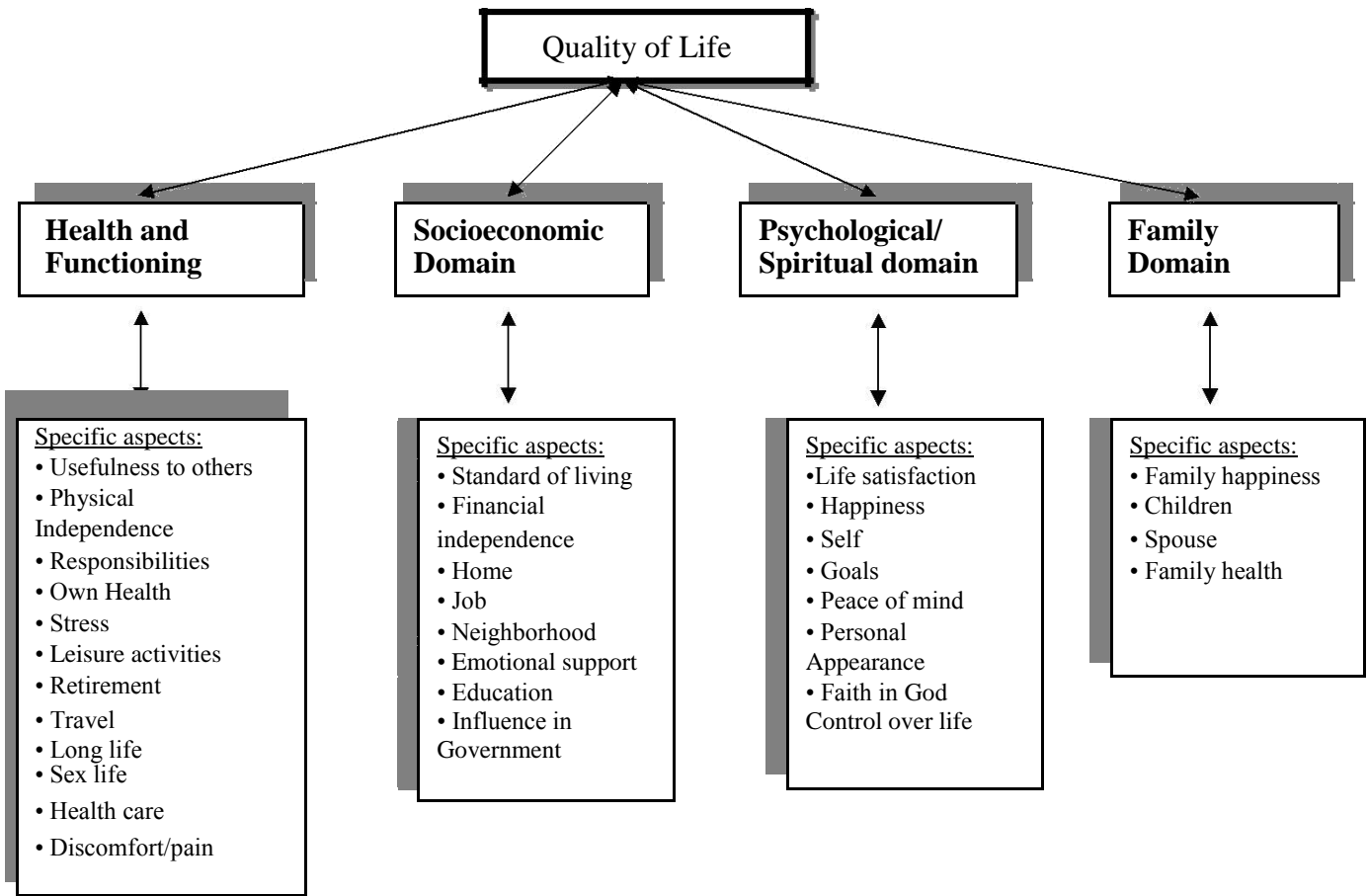
Figure (1): Ferran's Quality of Life Mode.
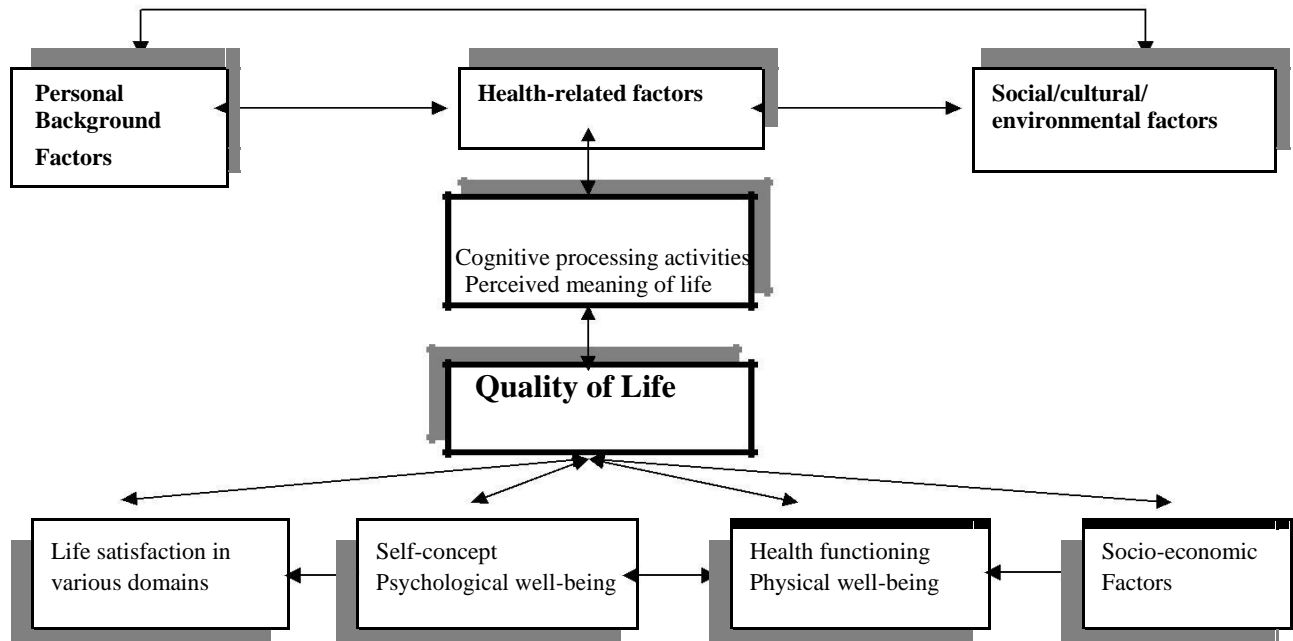
Figure (2): Zahn's conceptual model of quality of life.

Chapter 3: Literature review

This chapter reviewed the literature discusses the concept QOL. QOL and DM, and the impact of socio demographic factors on QOL have been presented.

3.1 QOL

QOL is considered one of the most important themes in the health status and health promotion literature. Improved QOL is the focus and desired outcome of providing health care services. Assessing HRQOL can also identify individuals in need of medical interventions, even in the absence of illness or other problems. From a broader health promotion or illness prevention perspective, QOL may be seen as an indicator of health risk, either physical or mental, in the absence of present treatment or service need (Raphael et al. 1996). The WHO succinctly summarizes this concern by stating that "adding years to life" is an empty victory without "adding life to years" (WHO 1998).

3.1.1 Definitions of QOL

QOL assessment is complicated by the fact that there is no universally accepted definition for QOL. QOL is understood to be both subjective and multidimensional. Because it is subjective, it is best measured from the patient's perspective. Because it is multidimensional, its measurement requires investigating about a range of areas of the patient's life, including physical well-being, functional ability, emotional well-being, and social well-being (Cella 1994, 189).

In this thesis the author has adopted the WHO's definition of QOL which identifies it as a multidimensional concept and defines it as "individuals' perceptions of their position in life in the context of the culture and value system in which they live and in relation to their goals, standards, and concerns" (WHO 1993). The definition includes six broad domains: physical health, psychological state, level of independence, social relationships, environmental features, and spiritual concerns.

The concept of QOL broadly encompasses how an individual measures the 'goodness' of multiple aspects of their life. These evaluations include one's emotional reactions to life occurrences, disposition, sense of life fulfillment and satisfaction, and satisfaction with work and personal relationships (Diener et al. 1999, 276-302). McDowell & Newell (1987) suggest that

QOL "relates both to the adequacy of material circumstances and to people's feelings about these circumstances". Coulter (1990) defines QOL as "a sense of personal satisfaction with life that is more than just pleasure or happiness and yet something less than meaning or fulfillment".

HRQOL is concerned specifically with health aspects while also accounting for general QOL components. McDowell and Newell (1996) on one hand, suggest that there is little difference between general health and QOL, and that the two can be measured in similar ways. On the other hand, Mathers and Douglas (1998) draw the distinction between observable objective measures of health status, such as in a clinical profile and an individual's perception about the quality of their life.

3.1.2 QOL assessment

In modern medicine the traditional way of assessing change in patients has been to focus on physical health condition such as clinical examinations and other investigations. While these give important information about the disease, especially about chronic diseases, it is impossible to separate disease from an individual's personal and social context. One way of capturing the personal and social context of patients is to use QOL measures (Higginson and Carr 2001).

It is important to differentiate between QOL and perceived health status from the perspective of patients, since that QOL and health status are distinct constructs. When rating QOL, patients give greater emphasis to mental health than to physical functioning. This pattern is reversed for appraisals of health status, for which physical functioning is more important than mental health (Smith, Avis, and Assmann 1999, 447-459).

Benefits of measuring QOL: Clinicians and policymakers are recognizing the importance of measuring HRQOL to inform patient management and policy decisions. HRQOL has been used to distinguish different patients or groups of patients, to predict individual outcomes, and to evaluate the effectiveness of therapeutic interventions (Guyatt, Feeny, and Patrick 1993, 622-629). QOL measures have eight potential uses in aiding routine clinical practice. They can be used to prioritize problems, facilitate communication, screen for potential problems, identify preferences, monitor changes or response to treatment, and train new staff. They can also be used in clinical audit and in clinical governance. The first five of these are of immediate value in the

clinical encounter, while the last three contribute to training, reviewing care, and improving care in the future (Higginson and Carr 2001).

Measuring the various dimensions of health is usually accomplished by evaluating multiple domains that represent the full spectrum of life functioning, involving physical, psychological, and social aspects. From an analytical perspective, QOL measures have been used to describe a condition or state of health, provide a prognosis, establish a reference norm, or signal a change in patient functioning. The large variety of instruments and evaluation tools available for assessing QOL in people with DM has been generated to meet a number of different research objectives. Most QOL instruments are developed for a particular purpose. Some QOL measures focus on describing the perceived state of health of the individual in order to understand the patient's needs, desires, preferences, and expectations so that suitable medical and support services can be provided. Other evaluations focus on learning more about external or internal determinants of QOL, such as SES, gender, coping, and social support. In addition, HRQOL assessment has gained recognition as an important research tool for evaluating the impact of new medical treatments and health care services for people with DM (Testa 2000).

QOL is multi-dimensional and is the person's own views about the quality of their life. Assessment of an individual's QOL may be undertaken by the use of measurement instruments that determine general aspects of QOL, aspects of the QOL related specifically to health status and even more specifically to particular disease processes such as DM (Borrott and Bush 2008). Instruments of measuring QOL**:** Global, generic, and disease specific instruments represent three different types of measures for the assessment of QOL:

Global measures are those designed to measure QOL in the most comprehensive or overall manner.

Generic measures have much in common with global measures and were designed primarily for descriptive purposes. In health care they delineate as comprehensively as possible the full impact of a disease or its symptoms on the patient's life. Generic measures are applicable to a wide range of populations (e.g., WHOQOL-BREF instrument).

Disease Specific measures were developed to monitor the response to treatment in a particular condition. These measures are confined to addressing the problems of selected patient groups (e.g., Diabetes Quality of Life Measure (DQOL) (Borrott and Bush 2008).

3.1.3 Physical health and QOL

Threats of physical disability, loss of independence, and diminished QOL may ultimately be the greatest concern for many with DM. Functional disability leads to loss of independence and predicts future hospitalization, institutionalization, and death.

Diabetes-related foot complications result in an enormous patient burden. Patients with DM and foot ulcers are at risk for hospitalizations, lower extremity infections, and amputations. Both foot ulcers and amputations result in decreased function, lowered QOL, and increased health care costs (Wrobel et al. 2003).

In a study compared HRQOL between diabetic patients with former or present but clinically stable Diabetic Foot Ulcers (DFUs), and other patients group without foot ulcers. None of the participants had other diabetic complications or conditions that would potentially affect HRQOL. Marked and significant differences were found in physical functioning, social functioning, physical role and health experience between the two groups. Presence or history of DFUs has a large impact on physical role, physical functioning and mobility and physical impairments especially influenced HRQOL (Meijer et al. 2001).

In another study conducted to estimate the prevalence of physical disability associated with DM among U.S. adults > 60 years of age. Physical disability was assessed by self-reported ability to walk one-fourth of a mile, climb 10 steps, and do housework. DM was associated with an increase of not being able to do each task among both men and women and increased risk of not being able to do all 3 tasks. Among women, DM was also associated with slower walking speed, inferior lower-extremity function, decreased balance, and an increased risk of falling. DM was associated with a major burden of physical disability in older U.S. adults, and these disabilities are likely to substantially impair their QOL (Gregg et al. 2000).

Different study assessed the QOL of people with type I and type II DM and non-diabetic controls using the Nottingham Health Profile (NHP). The NHP consists of six domains assessing energy, sleep, pain, physical mobility, emotional reactions and social isolation. The symptomatic

neuropathy patients had significantly higher scores (impaired QOL) in 5/6 NHP domains than either the other diabetic patients or the non-diabetic controls. The diabetic patients without neuropathy also had significantly impaired QOL for 4/6 NHP domains compared with the non-diabetic control group (Benbow, Wallymahmed, and MacFarlane 1998).

In summary, patients with DM are two to three times more likely to report disability than their non-diabetic counterparts (Gregg et al. 2000). And this in turn leads to diminished QOL and an increase in the economic burden for these individuals and society at large.

3.1.4 Psychosocial impact and QOL

Various literature documents the prevalence and course of psychiatric disorders, particularly affective and anxiety disorders, in adults and children with DM. Studies have demonstrated that depression and anxiety disorders are more common in patients with DM than in the general population and linked with poor glycemic control. Australian study conducted to assess the prevalence of DM, depression and their associations with QOL; it concluded that the prevalence of depression in the diabetic population was higher compared with the non-diabetic population. Those with DM and depression experienced a huge impact on QOL as compared with those who suffered DM and who were not depressed. However, a supplementary analysis comparing both depressed diabetic and depressed non diabetic groups showed there were statistically significant differences in the QOL effects between the two depressed populations (Goldney et al. 2004).

In an article reviews existing research on psychosocial and interpersonal barriers to DM self-management and QOL, psychosocial barriers were defined as psychological and interpersonal factors that impede DM self-management and QOL. Depression was a barrier that demonstrated inverse relationship to self-management and QOL. Psychosocial barriers influence other longer-term outcomes, such as glycemic control and eventual development of DM complications indirectly via their influence on self-management and/or QOL. The general psychosocial barriers that seem most strongly and consistently related to low levels of self-management and diabetes-related QOL are low self-efficacy and low levels of family social support (Glasgow, Toobert, and Gillette 2001).

Rubin and Peyrot (1999) have found that psychosocial factors, including health-related beliefs, social support, coping style, and personality type may have a potent effect on QOL. These effects

may be direct, or they may be indirect, buffering the negative impact of diabetes or its demands. These psychosocial factors may be the most powerful predictors of QOL, often outweighing the effects of important disease-related factors, such as complications.

A study aimed at determining the impact of an empowerment-based psychosocial intervention on the patients' QOL and glycemic control as compared to patients in standard care. Treated type II patients reported their improvement in QOL after the course regarding its psychological and social aspects; their metabolic control has improved as well. Better educated patients believing in internal health control and efficacy of diabetes treatment seemed to benefit the most (Pibernik-Okanovic et al. 2004).

DFUs are associated with reduced mobility and deficits related to activities of daily living that adversely affect HRQOL. Quantitative and Qualitative studies have confirmed clinical observations that DFUs have a huge negative psychological and social effect, including reduction in social activities, increased family tensions for patients and their caregivers, limited employment, and financial hardship (Goodridge, Trepman, and Embil 2005). In another qualitative study was conducted on Insulin-treated diabetics to explore the interactions between an individual's life at work and ways of coping with DM. It has showed that psychosocial adaptation, supervisor support was found to be a significant predictor of positive appraisal and diabetes-related satisfaction. Involvement and coworker cohesion also predicted aspects of diabetes-related QOL (Trief et al. 1999).

3.1.5 Patient's family environment and QOL

DM's burden is not limited on patients alone, but it involves their families. The family system plays influential role in assisting patients' DM.

In a study was conducted to evaluate whether the family system variables of adults with DM relate to the adequacy of metabolic control or the psychosocial adaptation to the illness. In regard to psychosocial adaptation part of this study, when family members behaved in ways that supported the DM care regimen, the individual with DM was more satisfied with his or her adaptation to the illness and reported less interference in role function due to emotional problems. Family cohesion also related to better physical function, which in turn, has an effect on their QOL (Trief et al. 1998). In another study to assess the relation between marital relationship domains (intimacy and adjustment) and HRQOL of individuals with DM, they found

that, better marital satisfaction and higher levels of marital intimacy were related to better HRQOL (Trief et al. 2002).

In other hand, family conflict has negative impact on QOL of diabetics. In Laffel et al. study (2003) to identify the relationships between diabetes-specific family conflict and QOL in youth with type I DM, they found that youth with type I DM reported that diabetes-specific family conflict predicted diminished QOL for the child. They also recommended that interventions should include efforts to reduce diabetes-specific family conflict in order to preserve the child's overall QOL. The same results were found by a study was conducted in Portugal to determine the impact of family factors on DM, particularly the influence of family support and family environment on QOL in adolescents with type I DM, taking in consideration age, sex, duration of disease, and social class. The results confirmed that improved QOL was predicted by lack of family conflict and family social support for both males and females (Pereira et al. 2008).

3.2 SES and demographic factors and QOL

The impact of SES and demographic factors on health has been extensively studied; studies have shown that low SES is related to lower values of various health and quality of health measures. This was approved by a study aimed to assess the influence of demographic factors and SES on HRQOL, females and elderly people were associated with impaired HRQOL. Disadvantaged SES i.e. primary education and low total household income was related to important decline in HRQOL and a similar relation was identified among men and women, the interaction effects between age and SES was statistically also significant (Pappa et al. 2009).

Education, income and age have relevant contribution to improve or diminish the QOL of diabetic people. A DM self-management survey was sent to 2,800 adults with DM throughout the U.S., to investigate the QOL and the demographic characteristics associated with it. QOL items included the social, physical, and mental health dimensions. Overall, respondents reported a moderate to low QOL, relative to previous studies. Factors related to lower QOL included: less education, lower income, older age, being female, number of DM complications, number of comorbid illnesses, and lower levels of physical activity (Glasgow et al. 1997). Another study done by Klein and colleagues to evaluate the self-reported QOL in individuals with DM of long

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duration, responses to the Medical Outcomes Study Short Form 36 as related to complications of DM, age, glycosylated hemoglobin level, and other characteristics were assessed. They found important note that in the younger-onset group, there are several characteristics that can be manipulated and that may lead to a relative improvement in QOL (Klein, Klein, and Moss 1998). The same results were found by a study aimed to describe possible differences in SES factors and QOL between diabetic patients in poor and good/acceptable metabolic control. The group in poor metabolic control was characterized by a lower educational level, a higher number of sick leave days or disability pension and a lower degree of physical activity (Larsson, Lager, and Nilsson 1999).

There are studies have shown the association between SES and demographic factors and QOL psychological domain. Higher SES was associated with better glycemic control and QOL; and poor glycemic control is associated with lower SES and depression, was in a study to test the hypothesis that poor glycemic control in type I DM is associated with depression and poor QOL, with a higher prevalence in persons of lower SES (Krishnavathana et al. 2006). Another example, in the study of Peyrot and Rubin (1997) to determine levels of depression and anxiety symptoms among adults with DM and identify factors associated with increased risk. It is shown that highest rates of disturbance for depression and anxiety were found in the middle-aged groups, consistent with studies that have found lower rates of disturbance among older age-groups. Women and those with less education were at much higher risk. The socio demographic factors account for much of the risk differential among people with DM.

In contrast to the previous studies and conclusions, different studies have found no correlations between QOL and one or more of the socio demographic factors. For instance, in a review of articles on HRQOL among diabetic patients in PHC in the Nordic countries, HRQOL was moderately affected in diabetic patients, with coronary heart disease and non-vascular diseases as the most consistently found and strongest predictors. Weaker predictors were micro vascular complications, age, sex, metabolic level, and education (Wändell 2005). Another study also was designed to measure the HRQOL of a sample of diabetic patients in India. Health status questionnaires were administered to diabetic Pima Indians. HRQOL was assessed using the SF-36 Health Survey. Internal consistencies of the eight multi-item scales of the SF-36 were

estimated. Nonparametric analyses were performed to determine relationships between mean SF-36 scale scores and various clinical and demographic variables. SF-36 scale scores were not influenced by sex or education level, age was significantly associated with four of the eight dimensions (Johnson, Nowatzki, and Coons 1996).

3.3 Impact of DM on the QOL

In this section, DM, its duration and complications impact on QOL were discussed. In addition to, how intensive treatment of DM disrupts the overall QOL.

People with DM have a worse QOL than people with no chronic illness especially regarding patient's general health and well-being, but a better QOL than people with most other serious chronic diseases. Severe dietary restriction and daily self-administration of oral medications or insulin may adversely affect an individual's HRQOL. In addition, complications of DM are the most important disease-specific determinant of QOL. The long-term complications of DM, such as nephropathy, neuropathy, heart disease, and stroke, with their considerable impact on health, may also have a negative effect on QOL (Rubin and Peyrot 1999).

3.3.1 Impact of DM duration on the QOL

QOL can be affected by illness duration with relation to all its domains, DM complications; treatment method and life style are associated with length of diseases. Several studies found that increased duration of DM was associated with decreased QOL, as in a study to estimate the HRQOL and treatment satisfaction for patients with type II DM in the Netherlands and to examine which patient characteristics are associated with QOL and treatment satisfaction. It is found that patients with complications, insulin therapy, longer years with DM and obesity were associated with a lower HRQOL (Redekop et al. 2002). Another study conducted in USA to reviews risk factors and its impact on QOL of Painful Diabetic Neuropathy (PDN). Data on risk factors for PDN were limited, but duration of DM and poor glycemic control were important factors (Schmader 2002).

In the study of Glasgow et al. (1997) to investigate the QOL and the demographic, medical-history, and self-management characteristics associated with it. They found those diagnosed with DM for a greater number of years reported lower physical and social functioning than persons diagnosed more recently.

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On the other hand, some studies have found no significant association between QOL and disease duration. Those supported by a study to examine the effects of type I and type II DM on patient perceptions of their QOL and compare the psychometric properties of a generic versus a diabetes-specific QOL measure. In the examination of the relationship of demographic factors to the DQOL measures suggests that they are not generally confounded by factors such as education, sex, or duration of DM (Jacobson, Groot, and Samson 1994). Finnish study examined the associations of health factors and psychosocial factors with HRQOL in a sample of adult type I diabetic patients and showed non-significant association between duration of DM and HRQOL dimensions on the Finnish version of the SF-20 (Aalto, Uutelab, and Aroc 1997). Similar agreement by a study investigated well-being and treatment satisfaction in adults with DM among Swedish population. One of the findings that there was no relation between the QOL with duration of DM, frequency of blood glucose tests per day, insulin regimens or diabetic complications (Wredling et al. 1995).

3.4.2 Impact of treatment regimen on the QOL

A research that has studied the association between treatment regimen and QOL in people with DM indicated that increasing treatment intensity in patients with type II DM from diet and exercise alone, to oral medications, to insulin, is associated with worsening QOL (Rubin and Peyrot 1999). An evidence-based study has assigned patients with non-insulin dependent DM for 4 programs: 1) diet, 2) exercise, 3) diet plus exercise, or 4) education (control). Detailed evaluations were completed prior to the program and after three, six, 12, and 18 months. One of the evaluation measures included measures of the QOL. At 18 months, the combination of dietary change and physical conditioning group showed significant improvements on a general QOL measures (Kaplan et al. 1987).

This agreed with the previous mentioned study done by Redekop et al. (2002) in the Netherlands. It has shown that Insulin therapy was associated with a lower HRQOL, independent of age and sex; patients using insulin were less satisfied with the treatment than other patients.

In contrast, a study purposed by Chantelau et al. (1997) to assess QOL in patients with type I DM in relation to the type of insulin therapy. Two patient groups were studied. In cohort A, the

first group intensified their traditional insulin injection therapy from up to two daily injections with syringe to multiple daily injections with insulin-pen; in the second one in cohort B, changed from intensive therapy with pen to insulin pump-treatment. Treatment satisfaction increased after intensification of insulin therapy in both groups, mainly due to greater flexibility with leisure-time activities, and with the diet.

Another study found that the type of therapy (tablet, diet or insulin) made little difference to psychological, social or attitude variables in patient with type 2 DM (Mayou, Bryant, and Turner 1990). Similar result found by a study showed no significant differences between patients with type II DM who were treated with insulin and those who were not and the negative impact of DM on HRQOL has been observed despite high levels of treatment satisfaction (Bradley and Speight 2002).

3.4.3 Impact of DM complications on the QOL

DM complications are costly and serious complications, for example foot ulcer preceding 84% of lower extremity amputations in diabetic patients and increasing the risk of death by 2-4 fold over diabetic patients without ulcers. HRQOL is worse among individuals with DM than individuals without DM, and complications of DM, especially foot ulcers, have a major negative effect on HRQOL (Goodridge, Trepman, and Embil 2005). In a study was conducted to describe the health utilities associated with DM and its treatments, complications. Major DM complications (blindness, dialysis, symptomatic neuropathy, foot ulcers, amputation, stroke, and congestive heart failure) were associated with more substantial reductions in QOL (Huang et al. 2007).

Even the presence of mild diabetic complications has a significant impact on patients' QOL. In a study assessed patients with type II DM who were not using insulin, patients were aged 35 and older and had stable fasting serum glucose. Patients who required insulin or suffered from severe cardiovascular or hepatic disease, neuropathy, or retinopathy were excluded. The most prevalent diabetic complications were hypertension (46% of patients), peripheral sensory neuropathy (PSN; 12%), coronary artery disease (CAD; 8%), retinopathy (8%), and peripheral vascular disease (PVD; 7%). Most (73%) of the complications were assessed to be mild. PSN was associated with significantly lower scores (i.e., worse QOL) in the mental health scale; CAD was associated with significant reductions of all but role-emotional and mental health scales; and

PVD was associated with significantly lower physical and social functioning scales (Lloyd, Sawyer, and Hopkinson 2001).

Another study was done to investigate factors with respect to HRQOL in patients with longstanding insulin dependent DM. The study has assessed the degree of metabolic control, the presence of late complications and HRQOL. Patients were divided into four groups based on metabolic control; those with poor control rated their physical and emotional functioning significantly lower than those with better metabolic control. 39% of patients appeared to be free from late DM complications. These patients rated their general health as better than patients who already had developed late complications. Which means a satisfactory metabolic control with a minimum of hypoglycemic episodes is desirable not only to prevent late complications but also because poor metabolic control seems to be one reason why diabetic patients experience a poorer QOL (Wikblad, Leksell, and Wibell 1996).

Chapter 4: Methodology

This chapter describes the samples, instrumentation, procedures and data analyses that were conducted for this study, including a description of the research design, selection of research sites, participant recruitment, data collection instruments and methods. Statistical analyses and the procedures used to analyze the data collected also discussed. The two main research questions are: a) What are the characteristics of QOL of diabetic patients, and b) What are the key factors that contribute to their QOL? It also includes a description of the sample size and characteristics, the research settings, the procedures for sample recruitment, data collection, and human rights protections. Finally, this chapter describes the instruments used as well as the data analysis procedures.

4.1 Research design

This cross sectional, correlational study explored the impact of DM on the HRQOL. A cross sectional, correlational research design measures data at a single point in time and is an effective method for describing the current status of phenomena and for examining associations or interrelationships among phenomena. According to Burns and Grove (2005), quantitative research uses numerical data and statistical analysis to obtain information about the world, giving the opportunity to describe and examine possible relationship among variables.

4.2 Study population

The target population for this study is composed of a sample of the registered diabetic patients attending both governmental and UNRWA health facilities at Northern Gaza governorate. The clients were attending to the DM clinic, for routine checkup, according to UNRWA registration records. In 2013 the registered refugees diabetic clients at Jabalia health center were 3946, and according to MOH registration records non-refugees diabetic clients at MOH Jabalia clinic were 932 patients.

4.3 Study site

For the purpose of this study, two health care facilities were chosen. Both MOH and UNRWA facilities have purposely chosen based on the high percentage of diabetic patients attending these

care facilities. This study was conducted in Jabalia camp; one of the largest refugee camp (Internally displaced people camp), where diabetic patients receiveing their health care from "UNRWA's Jabalia health center". Non-refugees diabetic patients receive health services from "MOH's Jabalia clinic" only. The researcher had good work experience in governmental sector he is currently working at UNRWA as well. Both organizations have registrars of diabetic patients where is accessible to find the target group of the study.

4.4 Sample size and sample process

The study participants were drawn from a convenience sample of diabetic patients. Initially, the researcher approached two health centers, and asked for permission to collect data (one governmental PHC and one UNRWA health clinic in Jabalia camp), and the approval was obtained. There were two research samples, the pilot study group and the final sample. It was not possible to obtain a random sample of participants, given the voluntary nature of the study. To meet the assumption of a normal distribution of cases, 10 respondents were needed for the pilot study sample and a goal of at least 140 respondents was set for the final sample. Power analysis indicated at least one hundred forty respondents would be needed in the final sample. One hundred eighty patients were approached by the researcher and asked to participate in the study. One hundred and forty diabetic patients completed the interview, resulting in a 77% response rate.

4.5 Selection criteria

4.5.1   Inclusion criteria

- Diabetic patients confirmed by WHO criteria for DM.
- Age 20 years and more (both male and female).
- Duration of DM more than 1 years.

4.5.2   Exclusion criteria

- Patient who did not agree to participate.
- Gestational DM.
- Inability to communicate due to physical or mental disability.
- Defaulters: patients who did not attend the NCD clinic at all during a calendar year, for follow up.
- Non-attendants: patients who did not attend the NCD clinic at all during 6 months, for follow up.

4.6 Period of the study

In order to collect the data, the clinic receptionist was to ask all patients who came to their facility during a 30-day period if they wanted to complete the questionnaire. The pilot study data were collected during May 2013 and the final data were collected between June 2013 and July 2013.

4.7 Ethical and administrative considerations, rights of human subjects and participant recruitment

- Participants were assured anonymity that participation was voluntary and that they could choose to discontinue their participation at any time.
- Participants were informed that their participation would have no bearing on any future professional relationship with the current medical provider or the researcher.
- Permission and approval letters were received to recruit patients from Dr. Mohammed Maqadma, Chief, Field Health Programme in UNRWA in Gaza, and Dr. Mohammed Sersawi, The director of Human Resources in MOH (Appendix D&E).
- The consent form is attached as Appendix A, every participant was provided with an explanatory form about the study for their personal records and as a reference with contact information should they have any questions or concerns regarding the research process. This form included the purpose of the study, confidentiality of information and some instructions; it also included statement about people's right to participate or to refuse that.
- Guarantees of confidentiality was given and maintained.
- Ethical concept, respect for truth and for people was considered.

4.8 Instruments

4.8.1 Socio-demographic sheet

The assessment tool for this study assigned into two parts: part one of the data collection was developed by the researcher himself to collect data about the participants' socio-demographic status (Appendix B). The socio-demographic information sheet covered the following areas of interest: 1) gender, age, educational level, marital status, and residence place; income status, 2) health profile: duration of DM, type of treatment, presence of complications or other chronic diseases.

4.8.2 The QOL questionnaire

Participants were asked to rate their QOL using the WHOQOL-BREF translated into Arabic and to provide ratings of their best (Appendix C). The WHOQOL-BREF is an abbreviated version of the WHOQOL-100 QOL assessment. It produces scores for four domains (physical health, psychological, social relationships and environment) related to QOL. The four domain scores denote an individual's perception of QOL in each particular domain. Domain scores are scaled in a positive direction (i.e. higher scores denote higher QOL). The mean score of items within each domain is used to calculate the domain score. Mean scores are then multiplied by 4 in order to make domain scores comparable with the scores used in the WHOQOL-100 (WHO 1996).

4.9 Pilot study

The researcher conducted a pilot study to test the appropriateness of data collection instrument, to identify the clarity and applicability of the tools, and to provide feedback about the questionnaire and standardize the data collection approach. A sample of 10 participants have been recruited, these 10 patients were excluded from the actual sample.

4.10 Data collection

Data were collected through structured questionnaire with participants in a private meeting room at health facilities, depending on participant preference. Patients who fulfilled the criteria were included in the study. Each participant was individually interviewed after explaining the purpose of the study and obtaining his/her verbal approval for participation in the study.

4.11 Data Analysis

After overviewing the questionnaire, each one was coded, and the usable number of questionnaires was determined. Data was coded and transferred into specially designed formats for data entry using the Statistical Package for Social Sciences (SPSS, version 19) program. Cleaning of data was done; the data was analyzed by performing the following statistical analyses:

a. Descriptive statistics were generated which included frequency distributions, percentage, means and standard deviation.

b. Independent sample t test was used to make comparisons among the demographic variables of respondents. The level of significance selected for this study was < 0.05.

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c. One way analysis of variance (ANOVA) was used to evaluate the differences in the four domains of the QOL among the different groups. In case of the presence of significant differences in the QOL domains among the groups and the independent variable composed of more than one level, a procedures called "post-hoc multiple comparisons" was used to determine these differences.

4.12 Limitations of the study

This study used a convenience sample of diabetic patients in Jabalia camp, which presented limitations related to external validity. Because this study's sample was drawn from a narrow, specific geographic area, this potential lack of variability may have influenced the results of the study.

QOL is a subjective measurement and assumes patients answer how they are feeling about their life honestly. The external environment may influence the way the patient answers the questions and in what context. Another limitation to this study involves the patient answering the questionnaire at the time follow up when anxiety and stress may be a hindrance to their participation. Other important limitations were the unstable political situation in Gaza Strip, time limitation and lack of education and research resources. Lastly, a potential for investigator bias may also have existed. The researcher conducted each interview, and the study participants were aware the research was being conducted for a thesis. A halo effect could exist, with participants attempting to provide answers they thought the researcher wanted to hear, instead of revealing their true feelings.

Limitations in this study include failure to consult patient's medical records to confirm complications and comorbidities rather than subjects self-report which is fraught with ambiguities, exaggeration. The instrumentation used has closed-ended answers, which may not accurately express the patients' feelings.

Chapter 5: Results of the study

5.1: Description of demographic data and SES of the participants

Table 1: distribution of the participants by demographic and SES characteristics

No	Variable	Frequency	Percentage
1	**Age** • 21 – 40 • 41 – 59 • >60	18 83 39	12.9 % 59.3 % 27.9 %
2	**Gender** • Male • Female	84 56	60 % 40 %
3	**Marital status** • Single, divorced, or Widow • Married	23 117	16.4 % 83.6 %
4	**Refugee status** • Refugee • Non-refugee	95 45	67.9 % 32.1 %
5	**Employment status** • Employed • Unemployed	29 111	20.7 % 79.3 %
6	**Education level** • Illiterate (No schooling) • Elementary school • Intermediate school • Secondary school • University/college	17 41 24 34 24	21.1 % 29.3 % 17.1 % 24.3 % 17.1 %
7	**Monthly Income** • No income • < 1800NIS • >1800NIS	27 94 19	19.3 % 67.1 % 13.6 %

Table 1 displays the demographic characteristics and SES of participants. The result revealed that 60% were males and 40% were females, the majority of them 83.6 % were married while 16.4 % were with no partner. The mean age was 52.4±Sd 11.4 years, age distribution shows 12.9% of the subjects were between the ages of (21-40) years, 59.3% between the ages of (40-59) years, and 27.9% above 60 years, around 90 % of participants are older than 40 years and that due to the nature of late onset of DM. The refugees formed 67.9 % of the participants and 32.1 % were non-refugees.

The educational attainment of diabetic clients ranged from illiteracy (they did not receive any formal education) to higher educational level. About 21% had no formal school education and are assumed to be illiterate, 29% had only primary school education, 17% and 24% of them had intermediate and secondary school education respectively, while 17% only had higher education. Many of the Palestinians, especially women, were unable to pursue their higher education because of either the financial hardships or the early marriage, resulted in that 20.7 % of subjects only were employed and 79.3 % were unemployed. The overwhelming majority of participants were with the average income of less than 1800 Israeli Shekels per month.

5.2 Rating QOL and satisfaction with health by the refugee status

Table 2: Percentage of the participants rated their QOL and satisfaction with health by refugee status

Rating QOL					
Refugee status of participants	**Very poor**	**Poor**	**Neither poor nor good**	**Good**	**Very good**
Refugee	12%	14%	35%	27%	12%
Non-refugee	25%	18%	40%	17%	
Satisfaction with health					
Refugee status of participants	**Very dissatisfied**	**Dissatisfied**	**Neither satisfied nor dissatisfied**	**Satisfied**	**Very satisfied**
Refugee	17%	19%	19%	39%	6%
Non-refugee	33%	30%	32%	5%	

Table 2 shows that both refugees and non-refugees were asked to rate their QOL on a scale from very poor to very good. The results were: 43% of the non-refugees reported poor and very poor QOL compared with 26% of the refugees. In the non-refugees patients, about 17% had rated their QOL as good and no one has rated for very good, meanwhile about 39% among the refugees rated for either good or very good.

The table also shows refugees and non-refugees diabetics were rated their satisfaction with their health on a scale from very dissatisfied to very satisfied. More than 60% of non-refugees were dissatisfied and very dissatisfied with their health; while around 35% of the refugees were so. On

the other hand, about 5% of the diabetic non-refugees were satisfied and no one was very satisfied in comparison with about 45% of the refugees.

5.3 Age and QOL domains of the diabetics by comparison of means

Table 3: Comparison of WHOQOL-BREF domains' means by age

QOL Domains	Age groups	N	MEAN	SD	F	P value
Physical domain	21-40 years	18	52.22	16.15	3.42	0.04
	40-59 years	83	48.96	13.89		
	>60 years	39	43.05	13.25		
Psychological domain	21-40 years	18	54.67	18.39	0.61	0.55
	40-59 years	83	52.65	14.65		
	>60 years	39	50.31	13.09		
Social domain	21-40 years	18	55.61	24.30	3.68	0.03
	40-59 years	83	54.39	21.26		
	>60 years	39	43.90	18.71		
Environmental domain	21-40 years	18	53.17	16.73	4.79	0.01
	40-59 years	83	44.19	15.66		
	>60 years	39	39.72	13.59		

One-way ANOVA test was used to compare the effect of age on the QOL domains for the diabetic patients. We can see in table 3 that the mean QOL of physical domain ranged from 52.22 for the age group (less than 40 years) to 43.05 for the age group (more than 60 years). The mean QOL of the psychological domain ranged from 54.67 for the group (less than 40), to 50.31 for the age group (more than 60 years). The social domain, however, had the better QOL mean scores (55.61). Meanwhile, the mean of the environmental domain represented the low mean score among the four QOL domains of the diabetic refugees. It started with 53.17 for the age group (less than 40), then decreased to 44.19 for the age group (40-59), and finally reached the lowest value (39.72) for the age group (more than 60 years).

Table 3 shows significant differences between the four QOL domains. As shown in the table, the most significant difference was found in the environmental domain (F 4.79, P value 0.01), then the social domain (F 3.68, P value 0.03), then the physical domain (F 3.42, P value 0.04), Meanwhile, no significant effect was found between age and the psychological domain (F 1.518, P value 0.196). This indicated that the psychological factors (such as burden of diabetes, life enjoyment), that the diabetic patients experienced affected all the population regardless of their age group.

5.4 Gender and QOL domains of the diabetics by comparison of means

Table 4: Comparison of WHOQOL-BREF domains' means by gender

QOL Domains	Gender of participants	N	MEAN	SD	F	P value
Physical domain	Male	84	46.07	14.68	0.22	0.09
	Female	56	50.23	13.34		
Psychological domain	Male	84	53.58	14.33	0.00	0.19
	Female	56	50.27	15.21		
Social domain	Male	84	49.71	22.27	0.64	0.20
	Female	56	54.48	19.87		
Environmental domain	Male	84	43.86	16.04	0.00	0.82
	Female	56	44.46	15.22		

As evidenced by the table 4, the males in the study had mean QOL in physical domain 46.07, psychological domain 53.58, social domain 49.71, and environmental domain 43.86. While the women of the diabetics had the mean score of 50.23 in physical domain, 50.27 in psychological domain, 54.48 in social domain, and 44.46 in environmental domain.

According to the findings shown in table 4, all of the calculated F-values were either zero as in the psychological and environmental domains or a little bit more as in the physical and social (0.22 and 0.64 respectively). Moreover, all of the significance levels of the all domains were more than 0.05 (0.09, 0.19, 0.20, 0.82) as shown in the last column. Clearly, we can conclude that no significant effects were found between the means of QOL domains of male and female diabetics; and the slight improvement in the QOL for female participants was either real but not significant or due to random error.

5.5 Refugee status and QOL domains of the diabetics by comparison of means

Table 5: Comparison of WHOQOL-BREF domains' means by refugee status

QOL Domains	Refugee status	N	MEAN	SD	F	P value
Physical domain	Refugees	100	48.08	15.02	3.92	0.653
	Non-refugees	40	46.88	12.27		
Psychological domain	Refugees	100	54.96	14.40	0.53	0.000
	Non-refugees	40	45.50	13.45		
Social domain	Refugees	100	55.07	20.93	0.05	0.002
	Non-refugees	40	43.00	20.33		
Environmental domain	Refugees	100	46.55	15.78	0.86	0.003
	Non-refugees	40	37.98	13.74		

As presented in table 5, the mean QOL of refugees (who attend UNRWA health center only) in physical domain 48.08, psychological domain 54.96, social domain 55.07, and environmental domain 46.55. In contrary, the means of the QOL domains among the non-refugees diabetics (who only attended MOH) were as follows: 46.88 in physical domain, 45.50 in psychological domain, 43.00 in social domain, and 37.98 in environmental domain. Overall, mean QOL domains among the diabetic non-refugees (MOH attendants) were less than those diabetic refugees attending UNRWA clinic. The best QOL domain for the diabetic refugees was the psychological domain, while the worst QOL domain was the environmental one. As shown in the above table, there was a significant differences between the diabetic refugees and non-refugees regarding the four QOL domains, and thus between UNRWA and MOH attendants. In the table, the most significant difference was found in the psychological and social domains (F 0.53, P value 0.000) and (F 0.05, P value 0.002) relatively, then the environmental domain (F 0.86, P value 0.003), whilst the physical domain showed no significance (F 3.92, P value 0.653). This can be attributed to the fact that diabetic patients (were refugees or not) experience the similar burden of illness and its consequences in regardless to their refugee status, the better means scores of refugees (UNRWA attendants) is due to the relative high QOL they receive compared with MOH center's QOL.

5.6 Employment status and QOL domains of the diabetics by comparison of means

Table 6: Comparison of WHOQOL-BREF domains' means by employment status

QOL Domains	Employment status	N	MEAN	SD	F	P value
Physical domain	Employed	29	52.52	13.79	2.051	.042
	Unemployed	111	46.49	14.17		
Psychological domain	Employed	29	58.97	13.69	2.824	.005
	Unemployed	111	50.50	14.54		
Social domain	Employed	29	62.52	23.00	3.179	.002
	Unemployed	111	48.77	20.11		
Environmental domain	Employed	29	55.72	13.70	4.835	.000
	Unemployed	111	41.06	14.75		

By comparing the means of QOL domains among the employed and unemployed subjects; table 6 obviously shows that the scores of the employed were higher than the scores of the unemployed in the four QOL domains. Specifically, the means of physical, psychological, social and environmental domains of the employees were 52.5, 58.9, 62.5, and 55.7 respectively, while

these domains among the unemployed were 46.4, 50.5, 48.7, and 41.0 respectively. The table shows also that there were strong significant differences between employed and unemployed patients in regard to the QOL domains. As shown the physical domain (F 2.051, P .042), psychological domain (F 2.824, P .005), social (F 3.179, P .002), environmental domain (F 4.835, P .000).

5.7 Income status and QOL domains of the diabetics by comparison of means

Table 7: Comparison of WHOQOL-BREF domains' means by income status

QOL Domains	Income status	N	MEAN	SD	F	P value
Physical domain	0 NIS	27	44.44	16.27	2.08	0.13
	1–1800 NIS	94	47.61	13.76		
	> 1800 NIS	19	53.05	12.78		
Psychological domain	0 NIS	27	53.19	14.69	5.22	0.01
	1–1800 NIS	94	50.10	14.16		
	> 1800 NIS	19	61.63	14.44		
Social domain	0 NIS	27	53.22	16.13	4.03	0.02
	1–1800 NIS	94	48.76	21.40		
	> 1800 NIS	19	63.53	24.46		
Environmental domain	0 NIS	27	42.89	13.29	7.83	0.00
	1–1800 NIS	94	41.90	15.19		
	> 1800 NIS	19	56.68	15.92		

NIS: New Israeli Shekel

As illustrated in table 7, the patients who have income >1800 NIS per month had the highest scores on QOL means and better than other patients who have 1800 or less NIS per month, as shown in physical domain 53.05, psychological domain 61.63, social domain 63.53, and environmental domain 56.68. While people who have no regular income per month had 44.44 in physical domain, 53.19 in psychological domain, 53.22 in social domain, and 42.89 in environmental domain. The patients gaining income of 1-1800 NIS had scores 47.61, 50.10, 48.76 and 41.90 for physical, psychological, social and environmental respectively. The result indicates significant mean differences between QOL domains and income status except the physical domain, as evidenced by physical domain (F 2.08, P 0.13), psychological domain (F 5.22, P 0.01), social domain (F 4.03, P 0.02), and environmental domain (F 7.38, P 0.00). This is not surprisingly, because the majority of diabetic patients are living in an extended families; this mean that, these patients seem to be overloaded not only with their personal expenses but also with the expenditure of the other family members who are economically

dependent on them. This negatively affected their ability to manage their illness, thus, negatively affected their quality of lives.

5.8 Education level and QOL domains of the diabetics by comparison of means

Table 8: Comparison of WHOQOL-BREF domains' means by education level

QOL Domains	Education level	N	MEAN	SD	F	P value
Physical domain	Illiterate (No schooling)	17	45.41	11.67	2.48	0.047
	Elementary school (1-6)	41	43.41	16.01		
	Intermediate school (6-9)	24	47.79	13.51		
	Secondary school (9-12)	34	49.62	13.47		
	University / College (12-16+)	24	54.04	12.68		
Psychological domain	Illiterate (No schooling)	17	46.47	11.25	9.16	0.001
	Elementary school (1-6)	41	47.15	14.10		
	Intermediate school (6-9)	24	46.21	14.91		
	Secondary school (9-12)	34	57.94	12.58		
	University / College (12-16+)	24	63.08	12.15		
Social domain	Illiterate (No schooling)	17	53.65	19.38	3.77	0.006
	Elementary school (1-6)	41	42.41	19.49		
	Intermediate school (6-9)	24	51.54	20.55		
	Secondary school (9-12)	34	54.44	22.02		
	University / College (12-16+)	24	62.00	21.18		
Environmental domain	Illiterate (No schooling)	17	38.12	12.77	7.58	0.001
	Elementary school (1-6)	41	38.07	14.85		
	Intermediate school (6-9)	24	40.71	13.93		
	Secondary school (9-12)	34	48.62	13.49		
	University / College (12-16+)	24	55.63	16.10		

Comparison of means of the different educational levels in the table 8 showed that the physical domain of the illiterate subjects was 45.41 in comparison with 49.62 and 54.05 of the subjects who had attained secondary school and higher education respectively. In addition, the psychological domain reflected the same results: the illiterate participants had a score of 46.47 while the participants who had a secondary school and higher education achieved better scores of 57.94 and 63.08 for the psychological domain. It was significant that clients who had higher education or finished their secondary school got higher scores in all QOL domains specifically psychological, social and environmental scores than those who only completed 9 or less educational years. Many of the Palestinians, especially women, were unable to pursue their higher education because of the financial hardships and/or the early marriage and tendency to form families.

5.9 Description of the participants' health status

Table 9: distribution of the participants by health status

No	Item	Frequency	Percentage
1	**Information receivers about DM by attended center** UNRWA MoH	 90 12	 90 % 30 %
2	**Duration of diabetes** 1 – 5 years 6 – 10 years >10 years	 55 45 40	 39.3 % 32.1 % 28.6 %
3	**Treatment regimen** Insulin alone Oral hypoglycemic agents (OHAs) Combinative therapy Diet and exercise	 24 93 18 5	 17.1 % 66. 4 % 12.9 % 3.6 %
4	**Diabetes complications** Nephropathies Neuropathies Retinopathies Heart diseases Stokes	 8 32 34 17 3	 5.7 % 22.9 % 24.3 % 12.1 % 2.1 %

Table 9 shows that about one-third (32.1 %) of subjects live with DM <10 years while 28 % had DM for longer than 10 years. The participants reported different types of treatment as indicated in table 9. About 17% of the participants were on insulin therapy; about 66% were on oral hypoglycemic agents (OHAs). Only 3% was exclusively managed by lifestyle modification such as diet control. Regarding the diabetic complications, more than 40 % of diabetic patients had neuropathies or retinopathies complications, 5.7 % only had Kidneys diseases and only 12 % live with heart diseases. Percentage of diabetic patients with complications was high (around 45% of the cases). 90 % of patients who attended UNRWA center received information about DM, while only 30 % of patients attended MOH center received information about DM.

5.10 The effect of DM duration on the means of QOL domains

Table 10: Comparison of WHOQOL-BREF domains' means by duration of DM

QOL Domains	Duration of DM	N	MEAN	SD	F	P value
Physical domain	1-5 years	55	49.3636	14.23658		
	6-10 years	45	50.9778	14.38353	5.23	0.006
	>10 years	40	41.8500	12.61369		
Psychological domain	1-5 years	55	52.7818	11.72160		
	6-10 years	45	55.1556	16.23542	2.418	0.093
	>10 years	40	48.2750	16.08310		
Social domain	1-5 years	55	54.3455	19.50234		
	6-10 years	45	57.1111	21.16625	6.74	0.002
	>10 years	40	41.7000	21.30391		
Environmental domain	1-5 years	55	47.6000	12.53528		
	6-10 years	45	45.9333	18.36796	5.942	0.003
	>10 years	40	37.2250	14.38569		

DM duration was categorized into 3 main categories as shown in table 10, it is observed that the QOL mean scores were started to decline to reach the worst values after 10 years of diagnosis (Means: 41.85; 48.27; 41.70 and 37.22 for the physical, psychological, social and environmental domain respectively). It is also worthy to observe that after 10 years of having DM, the physical and social domains were almost the same but low.

It is very clear from the results of post-hoc multiple comparisons that there were significant differences between the duration of diabetes and QOL. The results revealed strong differences between social domain and QOL (F 6.74, P 0.002), especially after five years of the diagnosis. On the other side, the environmental and physical domains were founded to have the second significant differences with the duration of DM.

According to post-hoc analysis, the patients who had DM for more than 10 years had significant differences with other duration periods (1-5 years and more than 6-10 years) in all domains except psychological domain.

5.11 The effect of treatment regimen of DM on the means of QOL domains

Table 11: Comparison of WHOQOL-BREF domains' means by treatment regimen

QOL Domains	Item	N	MEAN	SD	F	P value
Physical domain	Insulin	24	44.9167	16.06486	1.176	0.321
	OHAs	93	47.7312	13.88160		
	Both	18	48.7222	13.45059		
	Diet and Exercise	5	57.8000	14.16686		
Psychological domain	Insulin	24	48.6250	17.35264	1.273	0.286
	OHAs	93	52.3118	13.70891		
	Both	18	54.2222	15.24141		
	Diet and Exercise	5	61.6000	16.92040		
Social domain	Insulin	24	43.7500	26.75696	1.880	0.136
	OHAs	93	52.9032	19.92926		
	Both	18	51.7778	20.09845		
	Diet and Exercise	5	65.0000	17.63519		
Environmental domain	Insulin	24	41.2500	19.99185	1.076	0.382
	OHAs	93	44.2366	14.61640		
	Both	18	44.1667	14.87695		
	Diet and Exercise	5	55.0000	13.37909		

To identify the effect of treatment regimen on the QOL for the diabetic patients, the comparison of means and one-way ANOVA test was used. Table 11 shows that patients who are on diet and exercise use no medications; they had the highest means on all domains of QOL as follows: 57.80 in the physical domain, 61.60 in the psychological domain, 65.00 in the social domain, and 55.00 in the environmental domain. In contrast, patients who are on insulin therapy had the lowest scores in all means of QOL domains, 44.91, 48.62, 43.75 and 41.25 for the physical, psychological, social and environmental domains respectively. As we can observe from the above results that the means of the QOL domains of people on diet are better than those diabetic patients on insulin or oral hypoglycemic agents, and people on oral agents had better QOL than those on insulin. However, these differences do not reach significant differences in mean scores. Clearly, we can conclude that no significant differences were found between the means of QOL domains of diabetic patients and treatment modalities.

5.12 The effect of DM complications on the means of QOL domains

Table 12: Comparison of WHOQOL-BREF domains' means by DM complications

QOL Domains	Item	N	MEAN	SD	F	P value
Physical domain	No complications	78	50.83	13.45	4.72	0.01
	One complication	36	45.08	15.70		
	Two or more complications	26	42.12	12.44		
Psychological domain	No complications	78	54.91	12.05	4.20	0.02
	One complication	36	51.33	16.62		
	Two or more complications	26	45.58	17.37		
Social domain	No complications	78	56.81	19.54	6.12	0.00
	One complication	36	47.47	20.84		
	Two or more complications	26	41.81	23.52		
Environmental domain	No complications	78	48.92	12.49	10.12	0.00
	One complication	36	39.89	15.41		
	Two or more complications	26	35.46	19.38		

Table 12; describe comparison of WHOQOL-BREF means domain scores by DM complications. It is found that, first; patients who did not develop any complication had better means of the QOL domains (Physical domain 50.83, Psychological domain 54.91, Social domain 56.81, and Environmental domain 48.92) than those who had only one complication (e.g., Diabetic foot: Physical domain 45.08, Psychological domain 51.33, Social domain 47.47, and Environmental domain 39.89). Second, patients without complications had better QOL mean scores than those patients who suffered from two or more complications (Physical domain 42.12, Psychological domain 45.58, Social domain 41.81, and Environmental domain 35.46). Third, the diabetic patients who had one complication achieved higher QOL scores than those who suffered from more than one complication.

The results indicated that there was a strong significant effect of the complications on the QOL domains of the diabetic patients as shown in table 12. The P value for the physical domain is (P 0.01), for the psychological domain (P 0.02), for the social domain (P 0.00), and for the environmental domain (P 0.00).

Chapter 6: Discussion

The purpose of this study was to examine the impact of DM on the QOL. This chapter presents a discussion of the findings. The HRQOL of diabetic patients receiving treatment in both MOH and UNRWA clinics was studied in comparison to socioeconomic variables from the same geographical location and social-cultural environment.

6.1 The impact of refugee status on the diabetic patients' QOL

Regarding the effect of refugee life on QOL, table 5 showed strong and significant differences in the QOL domains between the diabetic refugees and non-refugees, and thus between diabetics who only attended UNRWA and those who attended MOH health centers. The significant differences were found in the psychological, social and environmental domains, this was because every one of the refugees feels that s/he is obliged to carry out her/his social responsibilities even though their health status is difficult. There was no significant difference on the physical domain that's because the impact of disease itself on both refugees and non-refugees.

The better scores that refugees (UNRWA attendants) showed in QOL domains have a strong relation with the financial crisis that PA in Gaza is experiencing recently; after the radical changes on political situation. Since 2007 until present, the siege imposed on Gaza, in turn hugely led to sever limitations in resources of health facilities and other governmental institutions, thus resulted in marked diminishing quality of care. However, UNRWA services relatively has been improving for refugees throughout the recent years; included health, education and other services regarding living conditions. In addition, UNRWA provides free services for all registered refugees only, while MOH provides service for all who have valid insurance. Therefore, diabetic refugees (who can attend UNRWA) had an access to better free health care than the non-refugees had (who were not able to attend UNRWA). The free and better quality of care is important factors in controlling DM and other existed illnesses and thus preventing any potential complications.

Another explanation, this difference may have resulted from the disparity in the SES of the patients. Non-refugees patients attending MOH were more likely to be of socioeconomically disadvantaged patients and thus were also less likely to be able to meet their needs of life, hence

they had worse HRQOL.

These results are inconsistent with the finding in the study conducted by Eljedi et al. (2006) that presented that refuge life negatively affected the QOL of the Palestinian diabetic refugees in comparison with the diabetic non-refugees who live in the cities in Gaza Strip. This could be due to the blockade and sever collective punishment imposed on Gaza in the recent years, add to the Egyptian closure of borders and shut down of the tunnels. This led the non-refugees in Jabalia to be deprived of social and economic benefits compared to refugees who are entitled for social assistance (either cash or in kind) from UNRWA, this in turn negatively affected non-refugees' QOL.

Another disagreement with the results of our study, with a study conducted to evaluate whether female Bosnian refugees have a poorer QOL than Swedish women, the results showed 38% of Bosnian refugee women irrespective of health status had lower QOL in 'appetite', 'memory', 'leisure time', and aspects of mental well-being such as 'energy', patience', 'sleep', 'mood', and 'health' (Sundquist, Behmen-Vincevic, and Johansson 1998).

6.2 The impact of age and gender on the patients' QOL

As shown in table 4, gender had no impacts on QOL domains, and this due to the fact that men and women carry the same burden of DM in regardless to their gender.

Pertaining the age and QOL, table 3 showed that all of the QOL domains of the diabetic patients were affected by the aging process but in different levels. The impact of old age on the physical and environmental domains was sever, while the social domain had the better QOL mean scores and there were no huge differences between the highest and the second lowest mean scores within the different age groups, because the Palestinian community is a conservative one and its members try always to maintain a cohesive adherence with each other and build durable relationships with the family members, neighbors, and other friends.

Due to this fact also, the environmental domain had the lowest means among patients above 40; who form 88 % of the patients. That because most of Palestinians after 40 starts to lack financial resources, freedom, and leisure activates as a result of the financial burden and responsibilities associated with their families and home environment as mentioned earlier, add to the expenses and psychological impact of DM placed on them. In summary, there was a significant effect of the aging process on the QOL of the diabetic patients especially on the physical and

environmental domains, while the effect of the age on the QOL psychological was mild but not significant. In general, scores of all QOL domains decreased with increasing life years (poor QOL).

These results agreed with Glasgow et al. (1997) study who suggested there is an association between age and specific aspects of well-being. Glasgow found that younger persons had significantly higher scores than older persons on SF-20 scales measuring physical functioning and social functioning. Similarly a study found that advancing age does affect some aspects of HRQOL, especially those associated with physical functioning, in people with DM (Klein, Klein, and Moss 1998). The results also are supported by a study assessed the influence of demographic factors on HRQOL and found females and elderly people were associated with impaired HRQOL (Pappa et al. 2009). On other hand, there was disagreement with the findings of Rubin and Peyrot (1997) study found no meaningful pattern of association between age and QOL. Also disagreed with a review of articles on HRQOL among diabetic patients, it found that weak predictors on HRQOL were micro vascular complications, age, sex, metabolic level, and education (Wändell 2005).

6.3 The impact of education level on the patients' QOL

As presented in table 8, the educational attainment of the participants ranged from illiteracy to higher educational level. The comparison of means shows significant effects of the educational level of the participants on the QOL. The higher the level of education, the better effect on QOL means. Educated people usually have higher self-esteem, ability for thinking & learning and better memory and concentration than who are less educated. Higher educated people, who had the best QOL means scores, are able to market their qualifications; so easier and faster to find employments and hence regular monthly income. This is supported by a study that found education improves QOL, because it increases access to non-alienated paid work and economic resources that increase the sense of control over life. It found also that the well-educated have lower levels of emotional distress (including depression, anxiety, and anger) and physical distress (including aches and pains and malaise) (Ross and Willigen 1997).

The results of our study also reflect the importance of the education for the diabetic patients to be able to correctly manage their disease. Many illiterate diabetics complaint of lack of knowledge

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about the diet, exercise, insulin, the symptoms of the hyperglycemia and hypoglycemia and so on. The educated patients demonstrated more ability than the non-educated to read and understand the medication instruction, pamphlets, leaflets and the bulletins about the disease. They were also more capable to behave correctly in the emergency situations. Many of the illiterate or low-educated patients had false perceptions about DM. They turned too frequently not to the professional doctors or clinics but to the traditional healers who ordered for them ineffective and harmful traditional prescriptions. All of that led to worsening of their disease conditions and diminished the overall QOL.

These results are strongly supported by many studies; one study aimed to assess the influence of SES on HRQOL, Disadvantaged SES i.e. primary education was related to important decline in HRQOL (Pappa et al. 2009). The study of Rubin & Peyrot (1999) also showed significant associations between SES (measured by income or educational level) and QOL in the general population, they found that study subjects who graduated from college were significantly less likely than those with less education to report symptoms of depression or anxiety consistent with the presence of a clinical disorder. The results are also consistent with a study done by Glasgow et al. (1997) reported that survey respondents who reported more education and higher income also scored higher on all sub-class of QOL.

Different study described differences in SES factors and QOL between diabetic patients in poor and good/acceptable metabolic control. The group in poor metabolic control was characterized by a lower educational level and a lower degree of physical activity (Larsson, Lager, and Nilsson 1999). However, our results here are contradicted with the results of other studies. For instance the same study of Wändell (2005), who found weak association between education and HRQOL. Another study also disagreed with above results; in a study HRQOL of diabetics was assessed using the SF-36 Health Survey. SF-36 scale scores were not influenced by sex or education level, age was significantly associated with four of the eight dimensions (Johnson, Nowatzki, and Coons 1996).

6.4 The impact of employment and income status on the patients' QOL
Based on the demographic and economic data of the participants, table 1, showed about 80% of the participants were unemployed, table 6 also showed the comparison between QOL domains

among the employed and unemployed subjects, and we found that the scores of the four domains of the employed were higher than the scores of the unemployed. The highest QOL mean scores were social and psychological domains, the reason could be that employed patients are likely to have social support and positive feeling from personal relationships at their work environments. While unemployed diabetics have lower QOL mean scores due to negative psychosocial impacts associated with the difficult financial hardship. This is strongly supported by a study evaluated the relation between work environments of adults with DM and the individual's adaptation to DM; and explored the interactions between an individual's life at work and ways of coping with QOL. Supervisor support was found to be a significant predictor of positive appraisal and diabetes-related satisfaction. Involvement and coworker cohesion also predicted aspects of diabetes-related QOL (Trief et al. 1999).

Regarding the income status table 7, there was a positive association between the QOL and the income status. In other words, the higher the monthly income, the better the QOL scores. Patients who have > 1800 NIS monthly income had better scores than who have no regular income. We can conclude from this part that a good economic situation is an important factor for the QOL of the patients especially those who suffer from chronic diseases. Perceived QOL scores increased as income increased for all categories, this may be the result of the patients with relatively more money being able to continue a certain standard of life.

This was supported by the study of Pappa et al. (2009) which aimed to assess the influence of SES on HRQOL; low total household income was related to important decline in HRQOL. Another study, of the association between poor glycemic control in type I DM and depression and poor QOL, it found that higher SES was associated with better glycemic control and QOL (Krishnavathana et al. 2006). In addition to the previous mentioned studies that support the results of the study such as Rubin & Peyrot (1999) and Glasgow et al. (1997) that showed the association between SES (income, education) and QOL, and concluded that more education and higher income had higher scores of QOL.

6.5 The impact of DM duration on the patients' QOL
Regarding the duration of DM and QOL, the results shown in table 10 represented a very interesting phenomenon. Directly after diagnosis, the patients suffered from the psychological

shock and they were not able to accept or adapt to the new situation; this is why their QOL values decreased in the first years of diagnosis. But after 5 years, they started to psychologically accept the condition and adapt to their disease and manage it correctly, as a result, their QOL means had improved. Finally, when DM extends to more than 10 years and the patients started to develop complications and/or co-morbidities, their QOL domains significantly decreased. These results corresponded well with the findings reported by several previous studies; a study conducted by Redekop et al. (2002) to estimate the HRQOL and treatment satisfaction for patients with type II DM in the Netherlands; it is found that longer duration of DM was associated with a lower HRQOL. The results agreed also with the results of a study conducted to find out the impact of risk factors of PDN on QOL, there was important relation between duration of DM and QOL (Schmader 2002). Another study promoted the results here, the study of Glasgow et al. (1997) to investigate the QOL and the demographic and medical history; it found significant relation between lower physical and social functioning and longer duration of DM.

On the other hand, the results are incompatible with studies have found no significant association between QOL and disease duration such as the study of the relationship between demographic factors and DQOL measures suggests that they are not generally confounded by factors such as education, sex, or duration of DM (Jacobson, Groot, and Samson 1994). And with the Finnish study showed non-significant association between duration of DM and HRQOL dimensions on the Finnish version of the SF-20 (Aalto, Uutelab, and Aroc 1997). This study also disagreed with a study investigated well-being and treatment satisfaction in adults with diabetes, one of the findings that there was no relation between the QOL and duration of DM (Wredling et al. 1995).

6.6 The impact of treatment regimen of DM on the patients' QOL
Regarding the effect of the treatment of DM on the QOL, we can observe from the table 11 that the means of all QOL domains for diabetic patients who were treated by OHAs were slightly better than those who were treated by Insulin. And those who were on diet and exercise had better scores in all domains than people who were on Insulin or OHAs. However, these differences among the means were not big to reach a significant effect and the slight

improvement in QOL for diabetic people on OHAs or diet can be attributed to the reason that patients unpleasantly accept being injected by insulin once or twice daily.

The ANOVA (table 11) also indicated no significant differences between the means of QOL domains of different regimen of treatments. These results are in conflict with the research that has shown increasing treatment intensity in patients with type II DM from diet and exercise alone, to oral medications, to insulin, is associated with worsening QOL (Rubin and Peyrot 1999). The results also are disagreed with the results of another study conducted in the Netherlands to estimate the HRQOL and treatment satisfaction for patients with type II DM. It has shown that Insulin therapy, obesity, and complications were associated with a lower HRQOL, patients using insulin were less satisfied with the treatment than other patients (Redekop et al. 2002).

In contrast, the results agreed with studies found no significant association between patients were treated with Insulin and those who were not and the negative impact on HRQOL domains such as the study done by Bradley and Speight (2002) despite high levels of treatment satisfaction. In regard to the type of insulin therapy, Chantelau et al (1997) two patient groups were studied. In cohort A, intensified their traditional insulin injection with syringe to injections with insulin-pen. In cohort B, changed from intensive therapy with pen to insulin pump-treatment. Treatment satisfaction increased after intensification of insulin therapy in both groups, due to greater flexibility with leisure-time activities, and with the diet.

6.7 The impact of DM complications on the patients' QOL

Regarding DM complications and QOL, Diabetic refugees recently have access to better health care (UNRWA) than the non-refugees, which in turn, may lead to better possibility to control their disease and to prevent the physical complications. For instances, at UNRWA clinics; diabetic refugees are examined for any retinopathies and for lower limbs ischemia or ulcers (diabetic foot) annually. UNRWA technical instructions of NCDs management recommend interval for next appointments for majority of diabetic patients monthly, while at MOH health centers; the patients are requested to attend when the medicines are available in certain dates of the months.

According to many studies, the complications are major predictor for the lower QOL of the diabetic patients. In this study, we found very clear significant effects of the different diabetes-

related complications on the QOL domains. Firstly, it is found that patients who did not develop any complications had better means of the QOL domains than those who had only one complication. Secondly, patients without complications had better QOL mean scores than those patients who suffered from one or more complication. Thirdly, the diabetics who had one complication achieved better scores than those who had two or more complications. This means that the patients who had two or more complication had the worst QOL, then those who had only one; had less worsening and so on.

This indicated that diabetic complications (blindness, dialysis, symptomatic neuropathy, foot ulcers, amputation, stroke, and heart diseases) were associated with more substantial reductions in all domains of the QOL. These results correspond with the findings of a studies were conducted by Huang et al. (2007) and Rubin & Peyrot (1999) to describe the health utilities associated with DM and complications. Major DM complications were associated with more substantial reductions in quality of life. Results also agreed with the study, has been done to investigate factors such as complications with respect to HRQOL in patients with DM. The study has showed patients without complications rated their general health as better than patients who already had developed late complications (Wikblad, Leksell, and Wibell 1996).

Chapter 7: Conclusion and Recommendations

7.1 Conclusion

The purpose of this descriptive correlational study was to describe the perceived QOL of Palestinian adults with DM. In this chapter a discussion of the findings, conclusions, and recommendations for future research, and implications are presented.

Many studies worldwide have noted the increasing in the prevalence of DM and its associated complications, and health care strategies were highlighted including DM management, educational approach and health care provision in diabetic care. QOL assessment has been a supplement to more objective clinical indicators and the measurement of the health outcomes of clinical interventions on their effectiveness and appropriateness like medical treatments and methods of organizing health services has become a cornerstone of health services research.

There has been a shift from defining health in terms of freedom from disease to an emphasis on the person's ability to perform his/her daily activities, and more recently on positive themes of social and emotional well-being, and QOL (McDowell 2006). The shift from a biomedical to a bio-psychosocial model helped health care providers, policy makers, and researchers realize that biological indicators are not adequate measures of functional status and well-being. To be able to measure health, McDowell (2006) suggests that we need to agree on a definition of what is to be measured, select indicators to represent the conception of health, and assign numerical scores to the indicators. The WHO's definition of health as a state of complete physical, mental, and social well-being has been extended to include HRQOL (Boarbotte et al. 2001). As with health, QOL is an abstract construct that is difficult to measure directly.

The WHO defines QOL as "the perception by individuals of their position of life in the context of the culture and value systems in which they live in and in relation to their goals, expectations, standards, and concerns". As stated earlier, information about patients' perceptions of their health has not been routinely collected in clinical research or medical practice in Palestine. This is partly due to the lack of valid Arabic version of WHOQOL instruments. The work of this study provided an Arabic version of QOL measure that is not validated and can be used in

clinical research. There are many aspects that need to be considered in order to achieve a comprehensive approach for the management of DM in Palestine and exploring HRQOL certainly is a valuable beginning. This study has provided new insights regarding the QOL of Palestinian diabetic adults. In future research, we can consider to test the validity of the WHOQOL instruments across a larger span of participants with DM.

The Socio-demographic factors presented by (refugee status, lower monthly income, less education, older age, and unemployment) were associated significantly with declination in physical, psychological, social and environmental QOL domains in comparison with the people had better situation in mentioned factors.

The burden and difficulty felt by the diabetic in adhering to treatment regime, as well as the conflict between having to carry out social roles and the necessity to sustain self-management behavior have been revealed to have a great influence on the diabetics' QOL.

This study also approved that the DM complications (eye and kidneys problems, symptomatic neuropathy; foot ulcers and amputation, stroke, and heart diseases) were associated with more substantial reductions not only in the physical abilities of the patients but also in their psychological wellness.

The existing diabetes care services especially governmental health facilities in Gaza Strip are less than the needs of the patients. Upgrading professionals' skills especially for staff running the NCD clinics through in-service training by specialist in different aspects of DM, and availability of needed medications in due time are very essential to improve the control and prevention measures.

Findings of this study provided an important assessment of the QOL of the diabetic refugees and non-refugees in Gaza Strip. This study provided meaningful information about the patients' life with DM. It provided an overview of how they affected by the disease, and how DM with scarce health resources influenced their daily activities. Since the effectiveness of diabetes management is to a large extent dependent on the patient, it is important to help diabetic patients minimize psychological distress and unnecessary impairment of QOL.

7.2 Recommendations

DM, especially type II DM is a serious disease and a cause for growing public health concern in most countries including Palestine. It is now a leading cause of death, disability and a high health care cost, which should urge all health authorities to be ready for this challenge.

Zimmet et al. (2003) in his article stated that controlling type II DM epidemic will require changes to the structure of health care delivery. Well-resourced interventions will be required, with effective coordination between all levels of government, health care agencies, multidisciplinary health care teams, professional organizations, and patient advocacy groups. Above all, intervention is needed today.

This research provides a picture of the DM in Palestine especially among the refugees and suggests a comprehensive management plan to minimize the daunting outcomes of DM and improve the QOL of the diabetics.

While several statistically significant differences were found when examining QOL scores and SES variables, analyses in other areas (including gender) revealed no significant differences. The sample and minimal variability in the geographic area in this sample is obviously a study limitation. Therefore, it is recommended that a random and larger sample size with more individuals in each category be used in future studies.

Discussion of potential reasons for QOL scores differences between refugees and non-refugees could be related to lack of access to quality of health care of non-refugees diabetic patients. Health care professionals can help to improve satisfaction with health care by providing treatment that is of high quality and consistent. It is recommended that health care practitioners provide services to diabetic patients, based on the standards of care established by the National health plan. The information derived from this study may be used to identify specific areas of concern which could then be used to design tailored health interventions.

It is further recommended that future studies examine additional organizational factors in more depth, to determine if they impact significantly on the quality of life and health status of diabetic patients. Development of a culturally sensitive Arabic version of WHOQOL tool for the use of future studies with Palestinian diabetic clients; is highly recommended.

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APPENDICES

Appendix A   Consent Form

Appendix B   Demographic information sheet

Appendix C   World Health Organization Quality of Life Questionnaire- short version (WHOQOL-BREF)

Appendix D   Approval from UNRWA for collecting data

Appendix F   Approval from MOH for collecting data

Appendix A

Oslo and Akershus University College of Applied Sciences
Faculty of Social Sicences

Consent form

Dear Participant,

I am a Master student in the faculty of social sciences at the Oslo and Akershus University College - Norway. I am conducting a research study about the quality of life of the diabetic Palestinian refugees and non-refugees who attend UNRWA and MOH clinics in Gaza strip.

You are invited to participate in this study. The following information is provided in order to help you to make an informed decision whether or not to participate. If you have any question, please do not hesitate to ask.

The general purpose of this study is to assess and evaluate the quality of life of the diabetic Palestinian refugees and non-refugees who attend UNRWA and MOH clinics in Gaza strip. This study sought an understanding of how the diabetics manage their illness and daily activities under the difficult conditions in Gaza.

This aims of this study are, first, to provide a general understanding of the experience of having and managing diabetes from the views of patients and how this impacts on their quality of their lives; second, to provide valid and reliable information that help in improving the quality of life for the diabetic refugees and non-refugees in Gaza strip. Third, health managers, administrators and policy-makers can also use the results of this study to plan for effective public health programs for diabetics to improve their abilities to control their disease and prevent its complications.

Your participation in this study is voluntary you have the right to withdraw at any time. You are free to decide not to participate in this study without adversely affecting the health services that you or any member of your family may receive from UNRWA or MOH. Please do not include your name in your response. All responses will be confidential and will be considered only in combination with those from other participants. The information obtained will be used only for scientific study purposes and may published in scientific journals or presented at scientific meetings.

Thank you very much for your completing the questionnaire and I appreciate the time you will take to complete this study.

Sincerely,

The resaercher   Participant's Signature.

Majed Abuawad

Appendix B

Demographic Info Sheet

Before you begin we would like to ask you to answer a few general questions about yourself: by circling the correct answer or by filling in the space provided.

I. Demographic data

Health center: ☐ UNRWA   ☐ MOH

Gender: ☐ Male   ☐ Female

Age: ☐ Years

Marital status: ☐ Single   ☐ Married   ☐ Divorced   ☐ Widow

Residency: ☐ Inside camp   ☐ Outside camp

Refugee status: ☐ Refugee   ☐ Non-refugee

Years of formal education: ☐ No schooling   ☐ Elementary school (1-6)
      ☐ Secondary school (9-12)   ☐ College/university (12-16+)

II. Socio-economic status

Employment status: ☐ Employed   ☐ Unemployed

Income monthly: ☐ NIS

III. Health Profile

When have you been diagnosed with diabetes?   ☐ Years

Have you ever received diabetes-related information? ☐ Yes   ☐ No

What medication do you take to control your diabetes?
      ☐ insulin   ☐ table   ☐ both   ☐ diet and exercise

Do you experience any of the following diabetes complications? (Check all that apply)
      ☐ None   ☐ Retinopathy (eye problems)
      ☐ Neuropathy (nerve problems)   ☐ Nephropathy (kidney problems)
      ☐ Heart disease   ☐ Stroke

Appendix C

THE WORLD HEALTH ORGANIZATION QUALITY OF LIFE (WHOQOL) -BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

		Very poor	Poor	Neither poor nor good	Good	Very good
1.	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

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		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

		Not at all	A little	Moderately	Mostly	Completely
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living	1	2	3	4	5
18.	How satisfied are you with your capacity for	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5

		Never	Seldom	Quite often	Very often	Always
20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living	1	2	3	4	5
24.	How satisfied are you with your access to health	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

		Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	5	4	3	2	1

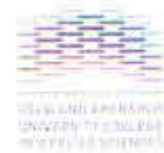**Do you have any comments about the assessment?**

_____

_____

The following table should be completed after the interview is finished

		Equations for computing domain scores	Raw score	Transformed scores*	
				4-20	0-100
27.	**Domain 1**	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18	a. =	b:	c:
28.	**Domain 2**	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26)	a. =	b:	c:
29.	**Domain 3**	Q20 + Q21 + Q22	a. =	b:	c:
30.	**Domain 4**	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25	a. =	b:	c:

Appendix D

To: Dr. Mohammed Al Maqadma
Chief Field Health Programme-UNRWA

From: Majed Said Abuawad
Practical Nurse at Jabalia Health Center
Emp No. 215459

Subject: Assistance for collecting data of master thesis

Best compliments. I am a master student of International Social Welfare and Health Policy at Oslo and Akershus University College of Applied Sciences- Norway. I am conducting my research as a part of my study requirement at the university. The study title is:

"Quality of life assessment of diabetic refugees and non-refugees patients who attend UNRWA and MOH health centers"

I am kindly asking for your approval that will assist me in collecting data from Jabalia health center-UNRWA
Confidentiality is ensured by both the student and university.

Kind Regards,
Majed

Appendix E

To: Dr. Mohammed Sersawi
The director of Human resources in MoH.

From: Majed Said Abuawad
Practical Nurse at Jabalia Health Center

Subject: Assistance for collecting data of master thesis

Best compliments. I am a master student of International Social Welfare and Health Policy at Oslo and Akershus University College of Applied Sciences- Norway. I am conducting my research as a part of my study requirement at the university. The study title is:

"Quality of life assessment of diabetic refugees and non-refugees patients who attend UNRWA and MOH health centers"

I am kindly asking for your approval that will assist me in collecting data from Jabalia martyrs' health center -MOH.
Confidentiality is ensured by both the student and university.

Kind Regards,
Majed