Deanship of Graduate Studies
Al- Quds University

Depression and quality of life of youth with juvenile diabetes mellitus attending UNRWA clinics in West Bank

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Dedication

I would like to thank my wonderful wife Shireen for her patience, understanding and encouragement. I appreciated her support and love during my study.

Declaration

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

Signed: Louy Fawadleh

Louy George Fawadleh

Date: 2-5-2015

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I would like to express my grateful, sincere gratitude and thanks to my supervisor Dr. Muna Ahmead for her help and support involved in all the steps of this research and also my deep thanks for her invaluable knowledge through the research process, without her support and cooperation, this work would not have been possible.

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Finally, my deep thanks to all the youth who participated in this study and who helped me in putting this thesis in practice.

Abstract

Background: Juvenile diabetes mellitus is one of the major chronic diseases which affects millions of people worldwide. There is an increase in the incidence of childhood type 1 diabetes mellitus which makes this disorder a major public health problem.

Aim: To assess depression and quality of life among youth with Juvenile diabetes (T1DM) aged 15-24 years who attended 20 UNRWA clinics in West Bank.

Method: A cross-sectional design was utilized to achieve this purpose. The data was gathered between the first of September, 2013 and finished at the end of October, 2013. Data was collected by using self reported questionnaire including 141 patients attending the UNRWA primary healthcare centers in West Bank. The self-reported questionnaire consisted of socio-demographic data sheet, Beck Depression Inventory Scale (BDI) and Quality of Life (QOL) and they included 57 items. Statistical analysis was performed using the statistical package for social sciences (SPSS), version 18.0 and were analyzed by the using parametric test such as frequency, T-test, ANOVAs test and Pearson's test.

Findings: Analysis of the patients' characteristics showed that the participants' age ranged from 15 to 24 years old of which 38.3% were less than 18 years old, 51.8% were males and 48.2% were females. The majority of the participants (42.6%) lived in villages, 87.2% were single, 35.5% had elementary education and 36.2% had family income from 1,000 NIS to less than 2,000 NIS monthly.

For the medical history, 73.8% who were having diabetes mellitus for more than 3 years, 31.8% of the participants suffered from diabetes complications such as eye complications and 31.2% of the participants had psychological problems.

The current study showed that the overall QOL for diabetic patients was (65.5%) and (47.5%) of them rated their quality of life as good and very good. They were satisfied

with the social domain more than other domains and they were least satisfied with the physical domain. In addition, the current study showed that 41.1% of the participants suffered from the presence of depressive symptoms.

Further, the findings showed that independent variables including gender, age, place of residency, marital status, educational level and psychological problems had significant effects on quality of life of the diabetes mellitus type 1 patients. In addition, the findings showed that gender, age, place of residency, marital status, educational level, diabetes complications and psychological problems had significant effects on depression among youth with diabetes mellitus type 1.

Furthermore, the Pearson's test revealed a strong inversed statistically significant relationship between quality of life and depression. The strongest relationship between QOL and depression was for the psychological domain and the weakest relationship was for the social domain.

Conclusion: The study found that diabetes mellitus type 1 affected negatively quality of life of youth with juvenile diabetes mellitus type 1 and its four domains (physical, psychological, environment and social) and these patients had a high level of depressive symptoms.

الإكتئاب و جودة الحياة لدى الشباب المصابين بمرض السكري النوع الأول في عيادات الأونروا في الضفة الغربية

إعداد الطالب: لؤي فواضله.

إشراف: دكتورة منى حميد.

ملخص الدراسة

خلفية الدراسة: النوع الأول من السكري هو أحد الأمراض المزمنة الذي يصيب ملايين الناس في جميع أنحاء العالم. هنالك تزايد في حدوث هذا النوع من السكري في مرحلة الطفولة مما أدى إلى مشكلة رئيسية في الصحة العامة.

الهدف: تحديد درجة الاكتئاب وجودة الحياة لدى الشباب المصابين بالنوع الأول من السكري لدى الفئة العمرية من 15 إلى 24 سنة من المراجعين في 20 عيادة تابعة للأونروا في الضفة الغربية.

منهجية الدراسة: إستخدمت الدراسة المنهج الكمي المقطعي من أجل تحقيق هذا الهدف. حيث تم جمع البيانات خلال شهرين من1 أيلول 2013 إلى 31 تشرين أول 2013. وتم جمع البيانات من 141 مريض سكري يراجعون في مراكز الرعاية الأولية في عيادات وكالة الغوث الدولية في الضفة الغربية. إحتوت الإستبانة على 57 سؤال. إستخدم برنامج الرزم الإحصائية للعلوم الإجتماعية لتحليل العينة. حيث إستخدمت النسخة 18 من هذا البرنامج لقياس العلاقة بين البينانات الديموغرافية (الشخصية)، إختبار بيك للإكتئاب وإختبار جودة الحياة لمنظمة الصحة العالمية وتم تحليلها عن طريق إختبار تحليل التباين الأحادي، إختبار تي تيست، إختبار التكرار، الاختبار الإرتدادي وإختبار بيرسون.

النتائج: تحليل بيانات المرضى أشارت إلى أن أعمارهم تراوحت بين 15-24 سنة، حيث أن 38.3% منهم أقل من 18 سنة، 51.8% ذكور و 48.2% إناث، أغلب المشاركين 42.6% يعيشون في القرى، 87.2% من العينة هم غير متزوجين، 35.5% يدرسون في المرحلة الإعدادية و36.2% دخل أسرهم الشهري يتراوح ما بين 1000 شيقل وأقل من 2000 شيقل.

كما أن 73.8% من عينة الدراسة مصابين بمرض السكري أكثر من 3 سنوات و31.8% من المشاركين يعانون من مضاعفات السكري مثل مضاعفات العين و 31.2% من المشاركين يعانون من مشاكل نفسية.

نتائج الدراسة الحالية أظهرت بشكل عام بأن جودة الحياة لدى المرضى المصابين بالنوع الأول من السكري هي (65.5%) و (47.5%) أجابوا بأن جودة الحياة لديهم جيدة وجيدة جداً، ورضاهم كان أعلى في الجانب الإجتماعي من الجوانب الأخرى وكما أن رضاهم كان أقل في الجانب الجسدي. بالإضافة إلى ذلك أظهرت الدراسة الحالية أن 41.1 % من المشاركين يعانون من اعراض الإكتئاب.

وأيضاً أظهرت النتائج بأن العوامل المستقلة والتي تشمل على الجنس، العمر، مكان السكن، الحالة الإجتماعية، المستوى التعليمي والمشاكل النفسية لها تأثير هام على جودة حياة المرضى المصابين بالنوع الأول من السكري. كما وأن النتائج أظهرت أيضاً بأن العوامل المستقلة والتي تشمل على الجنس، العمر، مكان السكن، الحالة الإجتماعية، المستوى التعليمي، مضاعفات السكري والمشاكل النفسية لها تأثير هام على نسبة الأكتئاب لدى المرضى المصابين بالنوع الأول من السكري.

كما أن إختبار بيرسون أظهر علاقة عكسية قوية بين جودة الحياة والإكتئاب. والعلاقة الأقوى بين جودة الحياة والإكتئاب كانت مع الجانب النفسي والعلاقة الأضعف كانت مع الجانب الإجتماعي.

الخلاصة: وجدت الدراسة بأن السكري النوع الأول له تأثير سلبي على جودة الحياة ومكوناتها الأربعة (الجسدي، النفسي، البيئي والإجتماعي) وهؤلاء المرضى لديهم درجة عالية من اعراض الأكتئاب.

List of Tables

List of figures

Table of Contents

Abbreviation

PHC	Primary Health Center
PMH	Palestinian Ministry of Health
WHO	World Health Organization
T1DM	Type 1 diabetes mellitus
DM	Diabetes mellitus
T2DM	Type 2 diabetes mellitus
IDDM	Insulin dependent diabetes mellitus
NIDDM	Non insulin dependent diabetes mellitus
HLA	Human leukocyte antigen
SMBG	Self monitoring of blood glocose
DKA	Diabetic ketoacidosis
HDL	High density lipoprotein
QOL	Quality of life
HRQOL	Health related quality of life
WHOQOL-Brief	World Health Organization Quality of Life- Brief
BDI	Beck Depression Inventory
YMCA	Young man Christian association
ECT	Electro convulsive therapy
SPSS	Statistical package for Social Science
PCBS	Palestinian Central Bureau of Statistics
MOH	Ministry of Health
UNRWA	United Nation Relief and Work Agency
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Forth Edition

Chapter One

Introduction

Chapter One

1.1. Introduction

Juvenile diabetes mellitus is one of the major chronic diseases which affects millions of people worldwide. It is a metabolic disorder characterized by glucose intolerance. This systemic disease is caused by an imbalance between insulin supply and insulin demand. It is one of the serious complex chronic diseases, which tend to accelerate degenerative changes throughout the body by widespread vascular changes in the large blood vessels and the micro vessels if not treated properly (American Diabetes Association, 2005). It affects mostly adults from the age of 25 years to 74 years, although it also affects children as young as 3 years old (American Diabetes Association, 2005).

The transition to adolescence is a time when conflict with the family often increases and adherence to treatment regimens often deteriorates. The same hormones that cause growth spurts in a child can also wreak havoc on his or her efforts to keep blood sugar level under control. As growth hormone increases during the early and middle adolescent years, the body becomes less sensitive to insulin. As a result, high glucose levels are common in late adolescents. When an adolescent reaches his or her full growth, these insulin-inhibiting hormones tend to decrease. The increased adolescent physical demands of sports, dance, gymnastics, and many other strenuous activities can also change insulin requirements. Increased autonomy in the formation of personal identity is an important developmental task of adolescence. This developmental task may be more complicated for Adolescents with T1DM because at this time in their lives, metabolic control and treatment adherence often deteriorate which result in poorer diabetes outcomes. Adolescents perceive support from family members primarily in the form of tangible support, such as reminding, helping, and even performing many of the self-management tasks (Fritsch et al., 2010).

Misunderstanding of the hormonal changes of development may lead to accusations of irresponsible diabetes management. Adolescents are most sensitive to being misunderstood and often blatantly disregard appropriated diabetes management in response (Fritsch et al., 2010).

WHO defined quality of life as individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment (WHO, 1997). Quality of life is important for people with diabetes and their health care providers for several reasons. Diabetes overwhelms them and leads to diminished self-care which in turn leads to worsened glycemic control, and increased risks for complications (Rubin, 2000).

Also, depression is commonly found as a co morbid condition in chronic medical illnesses in general, and diabetes mellitus in particular. Patients with diabetes are twice as likely to suffer from depression as compared to the general population. The relationship between depression and diabetes has been argued to be essentially bi-directional. Coexistence of diabetes and depression is associated with poor symptom control, increased suffering, health care expenditure, disability, decreased quality of life and greater risk of death. Treatment of depression may not only improve depressive symptoms, but may also have a positive impact on glycemic control and health care behaviors (Banwari. 2013).

1.2. Problem statement

The World Health Organization defined Juvenile diabetes mellitus as metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defect in insulin secretion, insulin action or both (WHO, 1999).

There is an increase of the incidence of childhood type 1 diabetes mellitus (Karvonen et al., 2000). This increase makes this disorder a major public health problem because of its high and rapidly increasing contribution of diabetes to the morbidity and mortality in the affected population. Type 1 diabetes mellitus (T1DM) occur in childhood and its peak of onset is early puberty. Worldwide, it is the third most prevalent severe chronic disease of childhood after asthma and mental retardation (Rewers, 1997; Scherbaum, 2002).

For example, globally, 10-20 million people are affected by diabetes type 1 (T1DM) and its incidence continues to increase by 3-5 % per year (Rewers, 1997; Scherbaum, 2002). Also, type 1 diabetes mellitus (T1DM) affects approximately 1.4 million people in the U.S.A .A very high incidence (20/100,000 per year) was found in Sardinia and the lowest incidence (1/100,000 per year) was found in the populations from China and South America (Rewers. 2004). The highest incidence in Arab countries is in Qatar and Kuwait and the lowest is in Oman and Jordan (Abdullah. 2005). About 40% of persons with type 1 diabetes are younger than 20 years of age, and type 1 diabetes mellitus (T1D.M) affects 1:300 children and as many as 1:100 adults during the life span (Rewers. 2004). In most populations, the incidence increased with age and was the highest among children 10–14 years of age (Karvonen. 2000).

In Palestine and according to the Palestinian Ministry of Health (2010), there were 4379 newly registered diabetes mellitus patients; of which 144 (3.2%) patients aged 15-24 years old had diabetes mellitus type 1. Also, in 2011, there were 3984 diabetes mellitus patients, of which, 73 (1.8%) patients aged 15-24 years old had diabetes mellitus type 1 and in 2013, there were 4816 diabetes mellitus patients, of which, 94 (1.9%) patients aged 15-24 years old had diabetes mellitus type 1. The highest rate of diabetes mellitus type 1 was in Hebron area and the lowest rate was in Tobas as seen in (table 1.1). finally, in Jerusalem, the rate is low and this might be because most of the patients with diabetes mellitus receive their treatment from the Israeli medical servicers and they are not registered by the Palestinian Ministry of Health.

Table (1.1): Distribution of new registered cases in PHC diabetic clinics aged 15-24 years old by gender and districts in West Bank (2010 – 2013).

Year	2010		Rate total %	2011		Rate total %	2012		Rate total %	2013		Rate total %
Sex	M	F		M	F		M	F		M	F	
West Bank	**67**	**77**	**3.2**	**24**	**49**	**1.8**	**46**	**61**	**1.7**	**49**	**45**	**1.9**
Jenin	3	12	10.4	3	8	15.0	4	7	10.2	2	3	5.3
Tobas	3	1	2.7	2	3	6.8	0	1	0.9	0	0	0
Toulkarm	1	2	2.0	2	4	8.2	3	2	4.6	3	3	6.3
Nablus	4	2	4.1	2	3	6.8	4	5	8.4	2	4	6.3
Qalqilia	3	2	3.4	0	0	0	2	2	3.7	2	0	2.1
Salfit	1	1	1.3	2	1	4.1	0	1	0.9	3	1	4.2
Ramallah	4	3	4.8	1	3	5.4	1	7	7.4	0	2	2.1
Jericho	1	3	2.7	1	4	6.8	1	0	0.9	1	0	1.0
Jerusalem	4	4	5.5	0	1	1.3	0	1	0.9	1	3	4.2
Beith lehem	6	4	6.9	1	6	9.5	4	4	7.4	5	1	6.3
Hebron	37	43	55.5	10	16	35.6	27	25	48.5	30	28	61.7
Incidence Rate (per 100,000)	**24.0**	**28.9**		**8.3**	**17.8**		**15.3**	**21.3**		**16.0**	**15.3**	

Also, according to UNRWA (2010), there were 6285 diabetes mellitus patients, of which, 590 (9.38%) patients had diabetes mellitus type 1 and in 2013, there were 6628 diabetes mellitus patients, of which 621 (9.36%) patients had diabetes mellitus type 1.

Also, these statistics showed that in 2014, there were 212 (31%) patients with diabetes mellitus aged below 20 years, 325 (48%) patients aged between 20-39 years old and 134 (20%) aged between 40-59 years old attended UNRWA clinics in West Bank. In 2013, there were 214 (33%) patients below 20 years old, 320 (49%) aged between 20-39 years old and 107 (16%) aged between 40-59 years old with diabetes mellitus type 1 (UNRWA. 2014).

The risk of devastating complications of diabetes mellitus type 1 among children and adolescents remains high including long damage, dysfunction and failure of various organs, progressive development of the specific complications of retinopathy, with potential blindness, nephropathy that may lead to renal failure, and neuropathy with risk of foot ulcers and amputation. In addition, patients with diabetes mellitus type 1 are at a risk for cardiovascular, peripheral vascular and cerebrovascular disease (WHO, 1999). These

complications may affect quality of life of these patients. Quality of life is important for people with diabetes and their health care providers for several reasons. Diabetes overwhelms them and leads to diminished self-care which in turn leads to worsened glycemic control, and increased risks for complications (Rubin, 2000).

Also, depression is commonly found as a co morbid condition in chronic medical illnesses in general, and diabetes mellitus in particular. Patients with diabetes are twice as likely to suffer from depression as compared to the general population. The relationship between depression and diabetes has been argued to be essentially bi-directional. Coexistence of diabetes and depression is associated with poor symptom control, increased suffering, health care expenditure, disability, decreased quality of life and greater risk of death. Treatment of depression may not only improve depressive symptoms, but may also have a positive impact on glycemic control and health care behaviors (Banwari. 2013).

The literature reveals a lack of studies in Palestine that assess the quality of life and depression among youth with juvenile diabetes mellitus type 1. Indeed, to our knowledge this may be the first study conducted for this purpose. The results of the current study might help the Palestinian Ministry of Health and UNRWA in establishing standards to ensure a smooth implementation of health programs at clinics, leading to healthier Palestinian adolescents and eventually adults, and to protect this age group from depression, and improve their quality of life.

1.3. Justification of the Study

- This study is selected because there is a lack of studies that are conducted to assess quality of life and depression among youth with Juvenile diabetes mellitus type 1 (T1DM) in Palestine.

- This study may help policy makers and managers in the Palestinian Ministry of Health and UNRWA in planning the services and interventions for this age group in the Palestinian community.

1.4. Main Objective

The aim of the study is to assess depression and quality of life among youth with Juvenile diabetes (T1D.M) aged 15-24 years who attended UNRWA clinics in West Bank.

1.5. Specific Objectives

1) To assess quality of life among youth with juvenile diabetes mellitus aged 15-24 years who attended UNRWA clinics in West Bank according to its major four domains: physical, psychological, social, and environmental.

2) To assess the level of depression among youth with juvenile diabetes mellitus aged 15-24 years who attended UNRWA clinics in West Bank according to its 4 level: minimal, mild, moderate and severe.

3) To assess the relationship between depression and quality of life among youth with juvenile diabetes mellitus who attended UNRWA clinics in West Bank.

4) To assess the relation between the independent variables such as age, gender, economic statues, level of education, duration of disease, complication, depression, and dependent variable; quality of life.

5) To assess the relation between the depression and other independent variables such as age, gender, economic statues, level of education and medical history including duration of disease and complication.

1.6. Research Questions

1) What is the quality of life of youth with juvenile diabetes mellitus type 1 (T1DM) aged 15-24 years old who attended UNRWA clinics in West Bank?

2) What is the prevalence of depression among youth with Juvenile diabetes mellitus (T1DM) aged 15-24 years old who attended UNRWA clinics in West Bank?

3) Is there a relationship between quality of life of youth with Juvenile diabetes mellitus type 1 and other independent variables such as socio-demographic data (age. gender, economic status, educational level, place of residency), depression, and medical history **(**duration of illness**,** and complication of illness).

4) Is there a relationship between depression of youth with Juvenile diabetes mellitus type 1 and quality of life, socio-demographic data (age. gender, economic status, educational level, place of residency), and medical history **(**duration of illness**,** and complication of illness).

1.7. Feasibility of the study

1) Ethical approval was obtained from Al-Quds University.

2) The researcher himself is working at the health department in UNRWA which facilitated the collection of the data.

3) The interest of UNRWA staff in conducting this study facilitated the completion of the study.

The next chapter discussed the literature review of the current study.

1.8. Summary

- The literature reveals a lack of studies in Palestine to assess the prevalence of depression and the quality of life among youth with Juvenile diabetes mellitus type 1 (T1D.M).

- The aim of the study is to assess depression and quality of life of youth with Juvenile diabetes mellitus type 1 (T1D.M) aged 15-24 years who attended UNRWA clinics in Palestine.

- The chapter also presented the problem statement, the study objective, research questions, limitation and feasibility of the current study.

Chapter Two

Literature Review

Chapter Two

2.1. Introduction

The word diabetes comes from a Greek word which means siphon, and it refers to one of the characteristic symptoms of the condition; the passage of increased volumes of urine. Also, the word mellitus comes which comes from a Latin word means honey-sweet (Campbell, 2002).

Diabetes mellitus is defined as a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both (American Diabetes Association, 2005). Another definition by Japan Diabetes Society is a group of diseases of heterogeneous etiology, characterized by chronic hyperglycemia and other metabolic abnormalities which are due to deficiency of insulin effect (Kuzuya et al., 2002). Diabetes could be symptomatic like polyuria, weight loss, thirst, polydipsia and blurred vision while sometimes it could be asymptomatic. Being symptomatic or asymptomatic depends on the severity of the metabolic abnormalities. (Kuzuya et al., 2002; American Diabetes Association, 2005).

Also, diabetes is the condition in which there is a raised level of glucose (sugar) in the blood. It is a major and increasing worldwide health problem for all age groups. For example, globally more than 150 million people have the condition predicted to exceed 220 million by 2010 and 300 million by 2025 (Campbell, 2002).

Variety of metabolic or genetic disorders may cause insulin resistance. For example, obesity is considered as one of the etiological factor for insulin resistance (Lebovitz, 1999). Furthermore, urbanization, aging, population growth, and physical inactivity are other major causes of increasing the prevalence of diabetes worldwide (Wild et al 2004; Wing et al, 2001). Significant complications are associated with diabetes mellitus such as retinopathy and neuropathy. These complications have significant impact on the patients, quality of life due to the increase of morbidity and mortality ratios (Cusick et al., 2005).

This chapter discussed the following issue:

Section one: Diabetes mellitus.

- Types of diabetes mellitus.
- Causes of diabetes mellitus type 1.
- Diagnosis of diabetes mellitus type 1.
- Treatment and interventions of diabetes mellitus.
- Diabetic complications.

Section two: Quality of life of youth with juvenile diabetes mellitus.

Section three: Depression.

- Introduction.
- Prevalence of depression.
- Causes of depression.
- Treatment of depression.

Section four: Studies that assessed the relationship between diabetes mellitus type 1, depression and quality of life.

2.2. Section one: Diabetes mellitus.

2.2.1. Types of diabetes mellitus

According to American Diabetes Association (Nordwall. 2006), there are 4 types of diabetes mellitus; type 2, gestational, other specific type and type1 diabetes mellitus.

2.2.1.1. Type 2 diabetes mellitus

Type 2 diabetes also known as non insulin dependent diabetes mellitus (NIDDM) results from an increase in the sensitivity of the cells to insulin and a decrease in the amount of insulin produced. About 90-95% of people with diabetes have type 2.The onset of type 2

occurs most frequently in people who are over 30 years of age, and about 80% of people with type 2 diabetes are overweight. The body does not produce enough insulin for proper function, or the cells in the body do not react to insulin (insulin resistance). The symptoms are not noticeable as in type 1 diabetes and may include feeling tired or ill, frequent urination, unusual thirst, weight loss, blurred vision, frequent infections, and slow healing of ulcers (WHO. 2000).

2.2.1.2. Gestational diabetes mellitus

It is a carbohydrate intolerance resulting in hyperglycemia of variable severity with onset or first recognition during pregnancy and usually disappears after the pregnancy is over unless it was diabetes type 1. Some women have very high levels of glucose in their blood and their bodies are unable to produce enough insulin to transport all of the glucose into their cells resulting in progressively rising levels of glucose. Undiagnosed or uncontrolled gestational diabetes can raise the risk of complications, including congenital malformations, increased birth weight and an elevated risk of prenatal mortality (WHO. 2000).

2.2.1.3. Other specific type and secondary

Other specific types are currently less common causes of diabetes mellitus, but are those in which the underlying defect or disease process can be identified in a relatively specific manner. They include, for example, fibrocalculous pancreatopathy (a form of diabetes which was formerly classified as one type of malnutrition–related diabetes mellitus). The prevalence is 1-2% of all diabetes (WHO, 1999).

Diabetes may also develop as a result of other diseases in the pancreas or any process that diffusely injures the pancreas. Acquired processes include pancreatitis, trauma, infection, pancreatectomy, and pancreatic carcinoma (American Diabetes Association, 2005).

2.2.1.4. Type 1 diabetes mellitus

Type 1 diabetes mellitus (T1DM) is known as insulin dependent diabetes mellitus (IDDM), or juvenile diabetes in which the pancreatic beta cells fail to produce the insulin hormone

when the immune system attacks the insulin-producing beta cells in the pancreas and destroys them. About 5-10% of people with diabetes have type 1 diabetes mellitus. This type 1 developed in the children and young adults, but the disorder may appear at any age. Symptoms include thirst, frequent passage of urine (polyuria), constant hunger, weight loss, blurring of vision and extreme tiredness. The risk factor of type 1 diabetes include auto immune, genetic and environmental (WHO, 2000). Type 1 diabetes mellitus (T1DM), which caused by autoimmune beta-cell devastation in the pancreas is categorized via a comprehensive need of insulin manufacture. Risk factors for type 1 diabetes include family history, race, and assured viral infections through upbringing (Porkka. 2012).

The classification of diabetes mellitus distinguishes between type 1a (autoimmune) and type 1b (not immune-mediated). Type 1a is the most common form of diabetes among children and adolescents of European origin and usually characterized by acute onset and dependence on exogenous insulin for survival. In adults, the disease is nearly as frequent as in children, but often less dramatic onset may lead to misclassification as type 2 and a delayed insulin treatment. About 60% of persons with type 1 diabetes are diagnosed as adults (Rewers. 2004).

Also, Type 1b called idiopathic has all the clinical features of type 1A, but the autoimmune component is not detected. Another 1B subtype is the fulminant diabetes most described in Asian peoples, mainly Japan, China and Korea, characterized by a short clinical history before to the first acute metabolic decompensation presents the impairment of beta and alpha cells of the pancreatic islet and no autoimmune etiology **(**Dib and Gomes. 2009).

The natural history of type 1a diabetes includes four distinct stages: (1) preclinical β-cell autoimmunity with progressive defect of insulin secretion; (2) onset of clinical diabetes; (3) transient remission; and (4) established diabetes associated with acute and chronic complications and premature death (Rewers. 2004).

2.2.2. Causes of diabetes mellitus type 1:

Type 1 diabetes is caused by a lack of insulin due to the destruction of insulin-producing beta cells in the pancreas. In type 1 diabetes an autoimmune disease attacks and destroys the beta cells. Normally, the immune system protects the body from infection by

identifying and destroying bacteria, viruses, and other potentially harmful foreign substances. But in autoimmune diseases, the immune system attacks the body's own cells. In type 1 diabetes, beta cell destruction may take place over several years, but symptoms of the disease usually develop over a short period of time (Watkins, 2003).

Also, heredity plays an important part in determining who is likely to develop (T1DM). Genes are passed down from biological parent to child. Genes carry instructions for making proteins that are needed for the body's cells to function. Many genes, as well as interactions among genes, are thought to influence susceptibility to and protection from type 1 diabetes. The key genes may vary in different population groups. Variations in genes that affect more than 1 percent of a population group are called gene variants. Certain gene variants that carry instructions for making proteins called human leukocyte antigens (HLAs) on white blood cells are linked to the risk of developing type 1 diabetes. The proteins produced by HLA genes help determine whether the immune system recognizes a cell as part of the body or as foreign material. Some combinations of HLA gene variants predict that a person will be at higher risk for type 1 diabetes while other combinations are protective or have no effect on risk (National Diabetes Information Clearinghouse, 2011, Porkka et al. 2012).

Further, a child of a mother with (T1DM) has an increased risk of developing the same type of diabetes amounting to 1-2% by 25 years; the risk is about three times greater if the father has this disease. If both parents have the disease, the risk is further increased and genetic counseling should be sought by these couples (Watkins, 2003).

In addition, environmental factors such as foods and toxins may play a role in the development of type 1 diabetes (National Diabetes Information Clearinghouse, 2011, Porkka et al. 2012). Viruses and infections are among these causes. A virus cannot cause diabetes on its own, but people are sometimes diagnosed with type 1 diabetes during or after a viral infection suggesting a link between the two. Also, the onset of type 1 diabetes occurs more frequently during the winter when viral infections are more common. Viruses possibly associated with type 1 diabetes include coxsackievirus B, cytomegalovirus, adenovirus, rubella, and mumps (National Diabetes Information Clearinghouse, 2011, Porkka et al. 2012).

Finally, infant feeding practices may raise or lower the risk of developing (T1DM). For example, breastfed infants and infants receiving vitamin D supplements may have a reduced risk of developing (T1DM), while early exposure to cow's milk and cereal proteins may increase the risk of having this disease (National Diabetes Information Clearinghouse. 2011, Porkka et al. 2012).

2.2.3. Diagnosis of diabetes mellitus type 1

Diagnostic boundaries for diabetes mellitus (D.M) are the same for children and adolescents as for adults: a fasting plasma glucose concentration of 126 mg/dl (7.0 mmol/L), versus the traditional value of 140 mg per dl (7.8 mmol/L), or greater, a plasma glucose concentration of ≥ 200 mg/dl (11.1 mmol/L) or greater measured 2 hours after an oral glucose tolerance test (ingesting 75 g of glucose), or a random plasma glucose concentration of 200 mg/dL or greater in a patient experiencing classic symptoms of hyperglycemia.

Diagnosis of type 1 diabetes is usually straightforward and requires little or no specialized testing. Most children and adolescents with type 1 diabetes present with a several week history of polyuria, polydipsia, polyphagia, and weight loss, with hyperglycemia, glycosuria, ketonemia, and ketonuria. Glycosuria alone, especially without ketonuria, may be caused by a low renal glucose threshold. Thus, an elevated blood glucose concentration must be documented to diagnose diabetes (WHO, 1999).

2.2.4. Treatment of diabetes mellitus type 1

The basic elements of T1DM management are insulin administration, nutrition and diet management, physical activity, self monitoring of blood glucose (SMBG), and the avoidance of hypoglycemia. In T1DM, since the pancreas can no longer produce insulin, patients are required to take insulin daily, either by injection or via an insulin pump **(**Amutha et al. 2013). There are different types of insulin which include lente, soluble and mixtard which is a mixture of the first two. Insulin injections lower blood sugar. Only some people with Type II diabetes need insulin, this is when the blood glucose is not well

controlled by tablets oral medications (Sulphonylureas and Biguanides). Insulin is sometimes used alone or with oral medications (Warren, 2002).

Patients with diabetes are able to improve diabetes control with diet and weight loss. A diabetic diet is relatively high in carbohydrates (50%-60% of total calories), low in fat (30% of total calories from fat, with 10% saturated fat, 10% polyunsaturated fat, and 10% monosaturated fat), and moderate in protein (20% of total calories). If malnourished or chronically ill, the diabetic patient should increase protein and energy intake. Vitamin and mineral supplements are indicated when caloric intake falls below 1000 kilocalories per day (Warren, 2002).

Also, the blood glucose response to exercise in patients with type 1 diabetes varies considerably both between and within individuals, likely depending on several factors including the type and intensity of exercise performed, the duration of the activity, and the level of circulating “on board” insulin during and after the exercise (Riddell. 2012). There are many benefits of exercise on patients with diabetes mellitus type 1. For example, physical activity promotes weight reduction and improves insulin sensitivity, thus lowering blood glucose levels (Alwan. 1994).In other words, after exercise, body doesn't need as much insulin to process carbohydrates (Daphne. 2009).

Exercise can also help people with type 1 diabetes to avoid long-term complications especially heart problems. People with diabetes type 1 are susceptible to developing blocked arteries (arteriosclerosis) which can lead to a heart attack. Exercise helps keep heart healthy and strong, plus exercise helps maintain good cholesterol and that helps to avoid arteriosclerosis (Daphne. 2009). During exercise whole body oxygen consumption may increase by as much as 20-fold and even greater increases may occur in the working muscles. To meet its energy needs under these circumstances, skeletal muscle uses at a greatly increased rate its own stores of glycogen and triglycerides, as well as free fatty acids derived from the breakdown of adipose tissue triglycerides and glucose released from the liver (American Diabetes Association. 2005).

For individuals with type 1 diabetes, the inability to reduce exogenous insulin levels during aerobic exercise is a key factor that contributes to an increased risk of exercise-induced hypoglycemia (Riddell. 2012). Although exercise is typically associated with an increased

risk for hypoglycemia, certain types of activity may promote hyperglycemia. Specifically, high intensity exercise tends to increase blood glucose levels because insulin levels do not rise in the portal circulation of the patient with diabetes to compensate for the normal increase in circulating catecholamine levels (Riddell. 2012).

Finally, drugs including metformin are a 'biguanide' medicine. It lowers blood glucose mainly by decreasing the amount of glucose that the liver releases into the bloodstream. It also increases the sensitivity of the body's cells to insulin so more glucose is taken into cells for a given level of insulin in the bloodstream. For example, metformin is the first tablet advised if the blood glucose level is not controlled by diet and exercise alone. It is particularly useful if the person is overweight because it is less likely to cause weight gain. It does not cause hypoglycaemia (low blood glucose level) (Warren, 2002).

Also, there are several types of sulphonylurea medicines including: Glibenclamide, Gliclazide, Glimepiride, and Glipizide. They work by increasing the amount of insulin the pancreas produces. A sulphonylurea is used if someone cannot take metformin because of side effects or other reasons or if the person is not overweight (Warren, 2002).

2.2.5. Diabetes complications

Diabetes complications can be classified as: 1) Acute problem which include diabetic ketoacidosis, hypoglycemia and hyperglycemia, and 2) Chronic complications which include micro vascular disease (eyes, kidney, and nerves) and macro vascular disease (heart attack). Around 4 million deaths every year are attributed to complications of diabetes mellitus (WHO, 2003). These complications are explained in more details below.

2.2.5.1. Acute diabetic complications

These complications include hypoglycemia, diabetic ketoacidosis and hyperglycemia.

1) Hypoglycemia

It is defined as blood glucose less than 50 mg/dl. The etiology of hypoglycemia in type 1 diabetes mellitus (T1DM) patient result from mismatch between insulin dose, carbohydrate ingestion and physical activity. The main symptoms are headache, weakness, sweating,

tremors, hungry, difficulty speaking, confusion, convulsion, and coma (Leslie et al., 1995). Hypoglcemia is classified as: 1) Mild hypoglycemias in which patients are able to treat themselves when they feel the symptoms such as tremors, palpitation, sweating, and hunger. 2) Severe hypoglycemia in which the symptoms include constipation, drowsiness, coma and seizure due to very low blood glucose level and patients' needs help from others (MOH, 2004; WHO, 2002).

2) Diabetic ketoacidosis

Diabetic ketoacidosis (DKA) is a potentially life threatening acute complication of type 1 diabetes mellitus (T1DM) characterized by a biochemical triad of hyperglycemia, ketonaemia (ketonuria) and acidaemia. DKA is caused by a decrease in effective circulating insulin associated with elevations in counter regulatory hormones. The likelihood of ketoacidosis occurring at the onset of diabetes varies considerably from one country to another (between 15% and 67%). DKA is the most frequent cause of diabetes related death in children with the mortality rate ranging between 6% and 24% in developing countries (Onyiriuka. 2013).

3) Hyperglycemia

Longer-term effects of chronic hyperglycemia have been noted to affect overall verbal intelligence, overall brain changes including decreased gray matter volume in the right cuneus and precuneus regions, smaller white volume in the right posterior parietal region, and increased gray matter in the prefrontal region (Fritsch et al. 2010).

2.2.5.2. Chronic complications

Also, diabetes is associated with several late stage complications that lead subsequently to mortality and morbidity. These late stage complications include microvascular and macro vascular complications as mentioned previously. Microvascular diseases result from the impact of glucose intolerance on the small blood vessels and include retinopathy, nephropathy, and neuropathy. Macro vascular disease involves the large blood vessels and is associated with atherosclerotic activity of these vessels (Davedson, 1991: ADA, 2004). These complications are influenced by several factors such as glycaemia control,

hypertension, and hyperlipidemia. The primary risk factor for micro vascular complications is hyperglycemia, while other risk factors such as hypertension and lipid control are the main for the development of macro vascular complications (Bate and Jerums, 2003).

These chronic complications most happen in adults but also they can occur in patients with juvenile diabetic (Bate and Jerums, 2003) and they are discussed in more details below.

1) Micro vascular complications:

1) Eye Complications or diabetic retinopathy:

The major eye complication of diabetes is called diabetic retinopathy. It occurs in patients who have had diabetes for at least five years. Diseased small blood vessels in the back of the eye cause the leakage of protein and blood in the retina. Disease in these blood vessels also causes the formation of small aneurysms (microaneurysms), and new but brittle blood vessels (neovascularization). Spontaneous bleeding from the new and brittle blood vessels can lead to retinal scarring and retinal detachment, thus impairing vision. To treat diabetic retinopathy, a laser is used to destroy and prevent the recurrence of the development of these small aneurysms and brittle blood vessels.

Approximately, 50% of patients with diabetes will develop some degree of diabetic retinopathy after 10 years of diabetes, and 80% of diabetics have retinopathy after 15 years of the disease. Poor control of blood sugar and blood pressure further aggravates eye disease in diabetes. Cataracts and glaucoma are also more common among diabetics. It is also important to note that since the lens of the eye lets water through, if blood sugar concentrations vary a lot, the lens of the eye will shrink and swell with fluid accordingly. As a result, blurry vision is very common in poorly controlled diabetes (Simon, 2011).

2) Kidney damage or diabetic nephropathy:

Kidney damage from diabetes is called diabetic nephropathy. The onset of kidney disease and its progression is extremely variable. Initially, diseased small blood vessels in the kidneys cause the leakage of protein in the urine. Later on, the kidneys lose their ability to

cleanse and filter blood. The accumulation of toxic waste products in the blood leads to the need for dialysis. Dialysis involves using a machine that serves the function of the kidney by filtering and cleaning the blood. In patients who do not want to undergo chronic dialysis, kidney transplantation can be considered. The progression of nephropathy in patients can be significantly slowed by controlling high blood pressure, and by aggressively treating high blood sugar levels (Simon, 2011).

3) Nerve damage or diabetic neuropathy:

Diabetes reduces or distorts nerve function, causing a condition called neuropathy. It is a common disorder and is defined as signs and symptoms of peripheral nerve dysfunction in patient with diabetes mellitus in whom other causes of peripheral nerve dysfunction have been excluded (Bansal et al., 2006). About 60% - 70% of people with diabetes have mild to severe forms of nervous system damage. Neuropathy refers to a group of disorders that affect nerves. The two main types of neuropathy are: peripheral (affects nerves in the toes, feet, legs, hand, and arms) and autonomic (affects nerves that help regulate digestive, bowel, bladder, heart, and sexual function) (Simon, 2011).

Diabetic nerve damage can affect the nerves that are important for penile erection causing erectile dysfunction. Erectile dysfunction can also be caused by poor blood flow to the penis from diabetic blood vessel disease. Diabetic neuropathy can also affect nerves to the stomach and intestines, causing nausea, weight loss, diarrhea, and other symptoms of gastro paresis (delayed emptying of food contents from the stomach into the intestines due to ineffective contraction of the stomach muscles) (Simon, 2011).

Peripheral neuropathy particularly affects sensation. It is a common complication that affects nearly half of people with type 1 or type 2 diabetes after 25 years. The most serious consequences of neuropathy occur in the legs and feet and pose a risk for ulcers and amputation. Peripheral neuropathy usually starts in the fingers and the toes and moves up to the arms and legs which is called a stocking-glove distribution. Symptoms include: tingling, weakness, burning sensations, loss of the sense of warm or cold, numbness (if the nerves are severely damaged, the patient may be unaware that a blister or minor wound has become infected) and deep pain (Simon, 2011).

Also, autonomic neuropathy can cause digestive problems (constipation, diarrhea, nausea, and vomiting), bladder infections and incontinence, erectile dysfunction and heart problems. Patients with diabetes may develop warning signs of a heart attack including sudden fatigue, sweating, shortness of breath, nausea, and vomiting, rapid heart rates and lightheadedness when standing up (orthostatic hypotension). Blood sugar control is an essential component in the treatment for neuropathy. Heart disease risk factors may increase the likelihood of developing neuropathy. Lowering triglycerides, losing weight, reducing blood pressure, and quitting smoking may help prevent the onset of neuropathy (Simon, 2011).

2) Macro vascular associated diseases:

Macro-vascular diseases include heart disease and stroke, and foot ulcers and amputations.

1) Heart disease and stroke:

Patients with type 1 diabetes are 10 times more at risk for heart disease. Heart attacks account for 60% of deaths in patients with diabetes, while strokes account for 25% of such deaths. Diabetes affects the heart in many ways. For example, both type 1 and 2 diabetes accelerate the progression of atherosclerosis (hardening of the arteries). Also, diabetes is often associated with low HDL (good cholesterol) and high triglycerides. This can lead to coronary artery disease, heart attack, or stroke (Simon, 2011, Rewers et al. 2004).

In type 1 diabetes, high blood pressure (hypertension) usually develops if the kidneys become damaged. High blood pressure is another major cause of heart attack, stroke, and heart failure. Children with diabetes are also at risk for hypertension. Impaired nerve function (neuropathy) associated with diabetes also causes heart abnormalities (Simon, 2011, Rewers et al. 2004).

2) Foot ulcers and amputations:

Foot ulceration, sepsis and amputation in diabetic patient are present and increase with poor glycemic control and duration of diabetes. This is a major cause of morbidity and disability of diabetic patient (Watkins, 2003). The cause of a diabetic foot is peripheral

neuropathy with loss of sensation, peripheral vascular disease, callus, foot bony deformity, and infections such as those resulting from blood vessel injury (WHO, 2002). About 15% of patients with diabetes experience serious foot problems. They are the leading cause of hospitalizations for these patients. The consequences of both poor circulation and peripheral neuropathy make this a common and serious problem for all patients with diabetes. People with diabetes who are overweight, smokers, and have a long history of diabetes tend to be at most risk. People who have the disease for more than 20 years and are insulin dependent are at the highest risk. Related conditions that put people at risk include peripheral neuropathy, peripheral artery disease, foot deformities, and a history of ulcers (Simon, 2011, Rewers et al. 2004).

Gradually, the affected foot can become deformed. The bones may crack, splinter, and erode, and the joints may shift, change shape, and become unstable. It typically develops in people who have neuropathy to the extent that they cannot feel sensation in the foot and are not aware of an existing injury. Instead of resting an injured foot or seeking medical help, the patient often continues normal activity, causing further damage (Simon, 2011).

2.3. Section two: Quality of life of youth with juvenile diabetes mellitus

2.3.1. Introduction:

This section discussed in details quality of life and its component particularly for youth with Juvenile diabetes mellitus.

2.3.2. Quality of life

Quality of life is defined as individual's perceptions 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. This definition reflects the view that quality of life refers to a subjective evaluation which is embedded in a cultural, social and environmental context (WHO, 1997). Because this definition of quality of life focuses upon respondent's perceived quality of life, it is not expected to provide a means of measuring in any detailed fashion symptoms, diseases or conditions, but rather the effects of disease and health

interventions on quality of life. As such, quality of life cannot be equated simply with the terms health status, life style, life satisfaction, mental state or well-being (WHO, 1997).

Quality of life may be thought of as a multidimensional construct incorporating an individual's subjective perception of physical, emotional, and social well-being, including both a cognitive component (satisfaction) and an emotional component (happiness) (Rubin, 2000). It represents an individual's perception on the ability to function well on a physical, mental and social level. It can be measured in a reliable and valid manner by the use of self-reported questionnaires which can be categorized in three main groups; generic, disease specific and domain specific questionnaires. Generic questionnaires measure quality of life in general terms, independent of the presence of any disease. Disease specific questionnaires measure the consequences of a specific disease for the quality of life (Schram et al., 2009).

Also, quality of life (QOL) measures have become a vital and often required part of health outcomes appraisal. For populations with chronic disease, measurement of QOL provides a meaningful way to determine the impact of health care when cure is not possible. Over the past 20 years, hundreds of instruments have been developed that purport to measure QOL. These instruments measure causal indicators of QOL rather than QOL itself. Health care professionals need to be clear about the conceptual definition of QOL and not to confound it with functional status, symptoms, disease processes, or treatment side-effects. Although the definition of QOL is still evolving, Revicki and colleagues defined QOL as a broad range of human experiences related to one's overall well-being. It implies value based on subjective functioning in comparison with personal expectations and is defined by subjective experiences, states and perceptions (Burckhardt and Anderson, 2000).

Quality of life components included four domains as seen in table (2.1): Physical health domain (such as pain, sleep, activity of daily living), psychological health and body image and appearance domain (such as negative or positive feelings, self esteem and religion), social relationships domain (such as personal relationships, social support and sexual activity) and environment and financial resources domain (such as financial resources, home environment, leisure activity and transport).

Table (2.1): The major domains and facets incorporated within each domain of quality of life scale.

Domain	Facets incorporated within domains
1. Physical health domain	Activity of daily living.
	Dependence on medicinal substances and medical aids.
	Energy and fatigue.
	Mobility.
	Pain and discomfort.
	Sleep and rest.
	Work capacity.
2.Psychological health and body image and appearance domain	Bodily image and appearance.
	Negative feelings.
	Positive feelings.
	Self-esteem.
	Spirituality / Religion / Personal beliefs.
	Thinking, learning, memory and concentration.
3. Social relationships domain	Personal relationships.
	Social support.
	Sexual activity.
4. Environment and financial resources domain	Financial resources.
	Freedom, physical safety and security.
	Health and social care: accessibility and quality.
	Home environment.
	Opportunities for acquiring new information and skills.
	Participation in and opportunities for recreation / leisure activities.

	Physical environment (pollution/ noise /trafic /climat).
	Transport.

(Orley. 1996)

Quality of life is important for people with diabetes and their health care providers for several reasons. First, diabetes overwhelm patients and leads to diminished self-care, which in turn leads to worsened glycemic control, increased risks for complications, and exacerbation of diabetes overwhelm in both the short run and the long run. Thus, quality of-life issues are crucially important because they may powerfully predict an individual's capacity to manage his disease and maintain long term health and well-being. Second, quality of life is also increasingly recognized as an important health outcome in its own right, representing the ultimate goal of all health interventions (Rubin, 2000).

Moreover, quality of life of diabetic patients is significantly reduced in the presence of both micro-vascular and macro-vascular complications. Poor quality of life in these patients is attributable to psychological effects of reduced general well-being, lack of acceptance and support from family members, feelings of restriction when complying with treatment, and self-monitoring strategies among others (Young and Unachukwn. 2012).

An assessment of patients with diabetic neuropathy showed that symptomatic diabetic neuropathy was associated with impaired quality of life in five out of six domains; emotional reaction, energy, pain, physical mobility, and sleep (Young and Unachukwn. 2012). Further, in school-aged children with type 1 diabetes mellitus (T1DM), parents still have to take very active responsibility for their management. Behaviors that are normal for the developmental stage such as oppositional interactions, emotional liability, and increasing need for independence, can interfere with such a management. In addition to the life of the child in the family, challenges also arise with respect to school and peer relationships. The needs to regulate or at least monitor dietary intake and physical activity conflict with the child’s need to be active with friends, to participate in sports, and to join activities involving food. A particular difficulty and point of conflict is misbehavior at mealtimes such as playing with food, talking rather than eating, or refusal to eat which generates anxiety in the parent who is concerned about the need for consistent intake. Such

behavior tends to elicit ineffective, over reactive discipline from parents (Fritsch et al., 2010) which may affect quality of life of these children and youth.

For example, in Italy, one study was conducted by Ausili et al. (2007) to assess health related quality of life (HRQoL) and metabolic assessment. The sample included 33 children affected with type 1 diabetes (18 males, 15 females). The data were collected by using Child Health Questionnaire - Parental Form 50 items (CHQ-PF50), Measurements of Metabolic Control and they related them to patient management and family status. The result showed that the quality of life (QOL) in diabetic children was worse than in the healthy sample (Ausili et al. 2007).

Another descriptive correlation study was conducted by Faulkner (2014) to explore the differences in quality of life for adolescents with type 1 diabetes versus healthy peers, and to investigate the possible influence of age, gender, race, and metabolic control on quality of life and health perception of the adolescents with diabetes. Data were collected by using the Diabetes Quality of Life Instrument for Youth. The study sample was sixty-nine adolescents with type 1 diabetes. The result of this study was that teens with diabetes expressed lower life satisfaction and health perception than controls; females with diabetes had lower life satisfaction than their male counterparts. Additionally gender variation in quality of life for adolescents with diabetes indicated that girls have greater impact and worries, and lower life satisfaction and health perception than boys (Faulkner. 2014).

Also, quality of life of depressed patients is significantly lower than that of the healthy population or even that of individuals with chronic medical disorders such as hypertension, cancer, or chronic pain, (Vilhauer. 2013). Some psychosocial factors, including health-related beliefs, social support, coping style, and personality type may have a potent effect on quality of life. These effects may be direct or they may be indirect, buffering the negative impact of diabetes or its demands. The psychosocial factors may be the most powerful predictors of quality of life, often outweighing the effects of important disease-related factors, such as complications (Rubin. 2000).

2.4. Section three: Depression.

2.4.1. Introduction:

As mentioned previously, type 1 diabetes mellitus (T1DM) is a lifelong, chronic disorder requiring rigorous attention regarding a complex regimen of diet, exercise, insulin by injection and self-monitoring of blood glucose to achieve a normal metabolic state. Diabetes mellitus type 1 is also potentially disabling condition and associated with life-treating complications (Atasoy et al. 2013) and mental disorders such as depression.

Depression is a mental disorder that is characterized by low mood accompanied by loss of interest or pleasure in normally enjoyable activities. Moreover, there are other symptoms covered an additional criteria such as: significant change in weight/ appetite, insomnia/ hypersomnia, psychomotor agitation, retardation, fatigue, difficulty concentrating, feelings of guilt or worthlessness, and suicide ideation (DSM-IVTR, 2000).

The symptoms of depression must persist for most of the day, nearly every day for at least 2 weeks. In addition, those symptoms must be accompanied by clinical significant distress or impairment in social, occupational, or other important areas of functioning (DSM-IVTR, 2000).

This section discussed depression prevalence, causes and treatments.

2.4.2. Prevalence of depression:

Depression has a high prevalence among patients with most chronic illness. Prevalence of depression is one out of ten people suffer from major depression and almost one out of five persons has suffered from this disorder during his lifetime (one-year prevalence is 10% and lifetime prevalence 17%) (WHO, 2001). By 2020, depression will be the second leading cause of world disability (WHO, 2001) and by 2030; it is expected to be the largest contributor to disease burden (WHO, 2008).

The prevalence of depression among patients with T1DM is 20-27% which is two to three times greater than in non-diabetic population (Atasoy et al. 2013). It is the most common

psychiatric disturbance followed by anxiety which have direct impacts on metabolic control in patients with diabetes mellitus type 1. It has been proposed that there might be a shared biological vulnerability between diabetes mellitus type 1 and depression (Atasoy et al. 2013). It has been found to be associated with poor self-care, impaired glycaemic control, poor micro-vascular and macro-vascular outcomes, higher healthcare costs, and impaired QOL (Atasoy et al. 2013).

There is a bidirectional association between depression and diabetes. The presence of diabetes doubles the odds of co morbid depressive disorder (Pompili et al., 2009). Similarly, the presence of depressive symptoms makes the afflicted individual more vulnerable to becoming diabetic (Atasoy et al. 2013).

Depressive disorders often start at a young age; they reduce people's functioning and often are recurring. For these reasons, depression is the leading cause of disability worldwide in terms of total years lost due to disability (WHO, 2012). Further, depression can lead to suicide and almost 1 million lives are lost yearly due to suicide which translates to 3000 suicide deaths every day (WHO, 2012). While depression is the leading cause of disability for both males and females, the burden of depression is 50% higher for females than males (WHO, 2008).

2.4.3. Causes of depression

There are many causes of depression such as family history because if close family members have experienced depression, he may have an inherited tendency. Inherited physiology is also involved in life changes such as the birth of a baby or menopause; both instances are associated with a greater risk of depression. Other factors may include divorce, the death of a loved one, job loss, chronic illness, retirement, or attending a new school and past history such as experiences of childhood sexual, physical or emotional trauma, extreme neglect or abandonment, (WHO.2012). A negative world may evolve from the relationship between negative experiences and thought influencing mood and behavior. 40% of people with depression struggle with the over-use of alcohol (WHO. 2012).

Two hypotheses attempt to explain the causal pathway between diabetes and depression. One hypothesis asserts that depression precedes type 2 diabetes, with depression occurring as a result of increased counter regulatory hormone release and action, alterations in glucose transport function and increased immune-inflammatory activation. These physiologic alterations are thought to contribute to insulin resistance and beta islet cell dysfunction, leading to the development of type 2 diabetes. The second hypothesis is that depression in patients with both type 1 and type 2 diabetes results from chronic psychosocial stressors of having a chronic medical condition (Leone. 2012).

Another prevailing hypothesis that attempts to explain the presence of significant depression in persons with diabetes is that, depression may develop as a result of psychosocial aspects of having diabetes including the psychological demands of managing the disease, the daily burden of self-care behaviors and the long-term risk of serious complications. The underlying biological mechanism may play a role in the association such as a dysregulation of the hypothalamus-pituitary-adrenal (HPA) axis or changes in hippocampus functioning (Trott. 2012).

Other factors associated with depression among individuals with diabetes include female gender, lower socioeconomic status, less education, younger age, being unmarried, having a lack of perceived social support, smoking status, duration of diabetes, experiencing chronic stressors or negative life events, having multiple chronic conditions, and having more diabetes complications (Trott. 2012).

Also, depression in persons with diabetes is associated with adverse consequences including poor glycemic control, poor adherence to self-care regimens, increased health care costs, and a higher risk of depression relapse. Additionally, depression has also been shown to have an impact on morbidity and mortality such that depressed persons with diabetes have an increased risk of complications and higher mortality rates than their non-depressed counterparts (Trott. 2012).

The economic impact of diabetes may also play a role in the development or exacerbation of depression in persons with diabetes (Musselman et al., 2003). Diabetes is an expensive disease to treat; direct costs to individuals with diabetes may include medical care,

medications, and blood glucose testing supplies. Other personal costs, such as increased insurance payments or loss of earnings, can occur with the onset of diabetes (Trott. 2012).

2.4.4. Treatment of depression

The majority of people with depressive disorders improve when they receive appropriate treatment. The first step of getting treatment is a physical examination by a doctor to rule out other possible causes for the symptoms. Then, the doctor conducts a diagnostic evaluation for depression or refers the patient to a mental health professional for this evaluation. Depending on the type of depression that the person may be suffering, various treatments are available including psychopharmacology and psychotherapy such as social skill training and group therapy (lliades, 2014).

1) Psychopharmacology

Because mood disorders are caused by a flaw in chemistry in addition to other factors, medications that alter brain chemistry are an important component in the treatment of mood disorders. The most common treatment for depression involves medication designed to increase the levels of neurotransmitters and thus improve the mood. The aim of using medication is to increase the levels of serotonin in the brain. Antidepressant therapy benefits about 65% to 80% of people with nondelusional unipolar depression (Ward et al, 2000). ECT has a 75% to 85% efficacy rate for those clients who are delusional or melancholic (Varcarolis et al., 2006). First line agents: selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs). Second line intervention: Monoamine oxidase inhibitors (MAOIs) and ECT (Shives, 1990).

2) Psychotherapy

Psychotherapy works by changing the way the mind functions. Psychotherapy and learning are similar in that both involve the formation of new connections between nerve cells in the brain. For example, cognitive behavior therapy changes irrational beliefs and distorted attitudes towards self, environment and future that would perpetuate depressive affects and compromise functioning (Gelenberg et al. 2010).

Also, interpersonal therapy focuses on current life changes, including losses, role disputes and role transitions, social isolation, deficits in social skills, and other interpersonal factors that may interact with the development of the depressive episode (Gelenberg et al. 2010).

Psychodynamic psychotherapy includes interventions deriving from psychodynamic theories about the etiology of psychological vulnerability, personality development, and symptom formation as shaped by development and conflict occurring during the life cycle from earliest childhood forward (Gelenberg et al. 2010).

Further, problem-solving therapy that combines elements of cognitive therapy (addressing negative assessments of situations) and interpersonal therapy is utilized in treatment of depression (focal problem solving) (Gelenberg et al. 2010). Finally, group therapy has some evidence to support its use as well as the potential advantage of lowered cost, inasmuch as one or two therapists can treat a larger number of patients simultaneously (Gelenberg et al. 2010). Group treatment is a widespread modality for the treatment of depression. It offers clients an opportunity to socialize and to share common feelings and concerns which decreases feelings of isolation as well as feelings of hopelessness and helplessness and alienation (Varcarolis et al., 2006).

2.5. Section four: Studies that assessed the relationship between diabetes mellitus type 1, depression and quality of life

Many studies were conducted to assess quality of life and depression among diabetic patients. For example, a cross-sectional observational study was conducted by de Ornelas Maia et al (2013), to assess the co morbidity of depression association with poor quality of life in type 1 and 2 diabetic patients. This study included 210 diabetic patients (105 patients with type 1 diabetes and 105 with type 2 diabetes). The data were collected using an instrument which is a brief (14-item) self-report measure of depression and anxiety and the WHOQOL-Brief.

The finding of this study revealed a high prevalence of depression in type 1 diabetic patients as 52.4% had depression more than the participants with type 2 (38.1%). Its finding suggested that type 1 diabetes was more related to mood than type 2 diabetes

because type 1 diabetes lead to more clinical complications. Also, the study concluded that impairments related to QoL were also higher in patients of type 1 than type 2 diabetes. This difference was statistically significant in physical, psychological and social relationship areas ($p<0.01$) (de Ornelas Maia et al. 2013).

Also, another study was conducted by Goldney et al. (2004) in South Australia to assess the prevalence of diabetes and depression and their associations with quality of life using a representative population sample. The sample was individuals aged ≥15 years. The results of this study revealed that the prevalence of depression in the diabetic population was 24% compared with 17% in the non diabetic population. Those with diabetes and depression experienced an impact with a large effect size on every dimension of the Short Form Health-Related Quality-of-Life as compared with those who suffered diabetes and who were not depressed. Also, the study showed that there were statistically significant differences in the quality-of-life effects between the two depressed populations in the physical and mental component (Goldney. 2004).

Further, a study was conducted by Hassan et al. (2006), to test the hypothesis that poor glycemic control in type 1 diabetes mellitus (T1DM) was associated with depression and poor quality of life (QOL), with a higher prevalence in persons of lower socioeconomic status (SES). The sample was adolescents with T1DM aged 8 to 17 years (n = 222). The data was collected by Children's Depression Inventory, the Hollingshead Four-Factor Index to determine SES, and PedsQL questionnaires to ascertain QOL. The result of this study showed that 9.5% of poorly controlled subjects were depressed, compared with 3% of well-controlled subjects. Logistic regression revealed a 27% increase in probability of depression per unit rise in HbA1C ($P < .03$). Higher SES was associated with better glycemic control ($P < .0005$) and QOL ($P < .0005$) and longer duration of illness was not associated with poorer glycemic control. Diabetes QOL deteriorated with poorer glycemic control ($P < .002$) (Hassan et al. 2006).

Also, a study was conducted by Grey et al (2014) to evaluate the factors that influence quality of life in adolescents with IDDM. The sample included 52 adolescents, aged 13-20 years old. The data were collected by Diabetes Quality of Life for Youths, Children's Depression Inventory, and Issues in Coping with diabetes, Diabetes Family Behavior

Scale, Family Adaptability and Cohesion, Self-Efficacy for Diabetes, and the Adolescent Coping Orientation. The result of this study revealed that teenagers whose diabetes had the greater impact (R^2 = 0.48) and were less satisfied (R^2 = 0.45) felt that management was more difficult (r = 0.56) and that diabetes was more upsetting (r = 0.63). They also used fewer rebellion strategies for coping (r = −0.44), had lower diabetes self-efficacy (r = −0.36), and had more depressive symptoms (r = 0.61). Also, the study showed that teenagers who were more worried (R^2 = 0.37) about their diabetes felt that management was more difficult (r = 0.40) and that diabetes was more upsetting (r = 0.58), and they used less rebellion (*r* = −0.49) and more ventilation (r = 0.42) to cope low self-efficacy, and were more depressed (*r* = 0.55) **(**Grey et al. 2014).

In USA, a study was conducted by Whittemore et al. (2002) to determine the correlates of depression in adolescents with type 1 diabetes. The sample of this study was 117 adolescents (72 F, 45 M; age = 14.3 ± 2.0 yr; duration = 6.3 ± 3.7). The data were collected with the Children's Depression Inventory (CDI), Diabetes Family Behavior Scale (DFBS), and Family Adaptability and Cohesion Scale (FACES). The finding of this study revealed that fifteen per cent of adolescents in this sample demonstrated depressive symptoms (CDI > 13) at study entry and 10% at 2 yr follow-up. Adolescents aged 14.1–16 yr and those with diabetes >10 yr demonstrated the highest rates (Whittemore et al. 2002).

In addition, another study was conducted by Hood (2006) to assess depressive symptoms in children and adolescents with type 1 diabetes included 145 youth (56% female) with a mean age of 14.9- 2.3 years (range 10–18). Duration of type 1 diabetes was 8.3-3.5 years. Depressive symptoms in youth were assessed with the Children's Depression Inventory (CDI), a self-report questionnaire consisting of 27 items. The finding of the study showed that 15.2% of the samples were scored at or above the clinical cutoff youth with elevated depressive symptoms. Also, its findings indicated that nearly one in seven youth with diabetes met the clinical cutoff for depression by their own report. This level of depressive symptoms in children and adolescents with type 1 diabetes was nearly double that of the highest estimate of depression in youth in general (Hood. 2006).

Also, another study was conducted by Lawrence et al. (2006), to determine if depressed mood among youth with diabetes was associated with type and duration of diabetes, mean

glycosylated hemoglobin (HbA1c) level, the frequency of diabetic ketoacidosis (DKA) and hypoglycemic episodes, hospitalizations, and emergency department (ED) visits. The sample included 2672 youth aged 10–21 years**.** The data were collected by using the Center for Epidemiologic Studies Depression Scale (CES-D). The finding of the study revealed that among these youth, 14% had mildly (CES-D 16–23) and 8.6% had moderately or severely (CES-D ≥24) depressed mood. Females had a higher mean CES-D score than males (Lawrence et al. 2006)

In Germany, one study was conducted by Blanz et al. (2014) to assess IDDM risk factors for adolescent psychiatric disorders. The samples included 93 IDDM adolescents, 17–19 yr of age and were compared with a healthy (no diabetic) adolescents. The finding of this study revealed that the rate of psychiatric disorders was 33.3% in the diabetic group, and more than threefold higher than in the control group (9.7%). The diabetic adolescents suffered from significantly more introversive symptoms than their healthy counterparts, especially somatic symptoms, sleeping disturbances, compulsions, and depressive moods **(**Blanz et al. 2014).

Another study was conducted by Pompili et al. (2009) to evaluate the perceived quality of life and its association with suicide risk in Italian patients with diabetes mellitus. The sample included 100 patients with type 1. The data were collected by Beck Hopelessness Scale, the Suicide Score Scale, the SF–36 Health Survey Questionnaire, and the General Self-Efficacy Scale. The finding of this study revealed that patients with diabetes showed greater hopelessness and suicide ideation than internal-medicine outpatients. Poor quality of life was related to low self-efficacy, high hopelessness, and suicidality (Pompili et al. 2009).

In Amsterdam, one study was conducted by De Wit et al. (2007) to assess validation of the WHO-5 well-being index in adolescents with type 1 diabetes. The sample was ninety-one adolescents with type 1 diabetes (aged 13–17 years). The data were collected by Studies Depression Scale (CES-D), the Diabetes Family Conflict Scale (DFCS), and the mental health and self-esteem subscales of the Child Health Questionnaire (CHQ-CF87). The finding of this study indicated that the WHO-5 showed a moderate to strong correlation with the CES-D ($r = -0.67$), with the mental health *(*r = *0.60)* and self-esteem ($r = 0.43$)

subscales of the CHQ-CF87, and with the DFCS ($r = -0.34$), confirming concurrent validity (De Wit et al. 2007).

In addition, another study was conducted by Katerndahl et al. (2012) to determine whether current depression was associated with poorer quality of care and poorer patient adherence to treatment regimens and whether current depression was associated with patient diabetes outcomes independent of its relationships to quality of care and patient adherence among patients with diabetes. The data was collected by offices of family physicians that belong to the Statewide Primary Care Ambulatory Research and Resources Consortium from March 2006 to March 2011. The finding of this study indicated that depression was associated with poorer compliance, quality of care, diabetes-related quality of life, and patient satisfaction; and only HbA_{1c} levels did not correlate with depression. Also, when adjusting for compliance and quality of care, depression was still associated with poorer quality of life and satisfaction ($P \leq .001$). While physician recognition and treatment of depression were less than optimal, depression severity was a significant predictor of receiving some form of mental health intervention ($P \leq .05$) except for the provision of mental health counseling. Poor diabetes control was associated with the provision of counseling ($P \leq .10$), while poor quality of life was associated with recognition of depression ($P \leq .10$) (Katerndahl et al. 2012).

Finally, a descriptive correlation study was conducted by Faulkner (2014), to explore the differences in quality of life for adolescents with type 1 diabetes versus healthy peers and to investigate the possible influence of age, gender, race and metabolic control on quality of life and health perception of the adolescents with diabetes. Data were collected by using the Diabetes Quality of Life Instrument for youth. The study sample was sixty-nine adolescents with type 1 diabetes. The results of this study were that teens with diabetes expressed lower life satisfaction and health perception than controls; females with diabetes had lower life satisfaction than their male counterparts. Additionally gender variation in quality of life for adolescents with diabetes indicated that girls have greater impact and worries, and lower life satisfaction and health perception than boys (Fulkner. 2014).

In summary, most of the previous discussed studies showed that youth with juvenile diabetes mellitus had lower quality of life and high prevalence of depression and all of these studies were conducted in countries other than Palestine.

The next chapter discuses the conceptual framework of the study.

2.6. Summary

- There are 4 types of diabetes mellitus, type1, type 2, gestational, and other specific type.

- There are different causes of diabetes mellitus type 1 such as genetic susceptibility, autoimmune destruction of beta cells, environmental factors, viruses and infections, and infant feeding practices.

- Diabetes complications can be classified as: 1) Acute diabetic complications which include hypoglycemia and diabetic ketoacidosis. 2) Chronic complications which include micro-vascular complications and macro-vascular associated diseases.

- There are four domains for quality of life: Physical health activities of daily living, psychological, social relationships, and environment.

- There is a bidirectional association between depression and diabetes. The presence of diabetes doubles the odds of co morbid depressive disorder.

- Depression can affect quality of life negatively among youth with juvenile diabetes mellitus.

Chapter Three

Conceptual Framework

Chapter three

3.1. Introduction

Conceptual framework is a tool structured from a set of broad ideas and theories taken from relevant fields of enquiry that help researchers to properly identify the problem they are looking at, guide their inquiry, frame their questions and find suitable literature. Most academic researchers use a conceptual framework at the outset because it helps the researcher to clarify his research question and aims (Smyth, 2004). It can be a visual or written product that is explained either graphically or narrative (Polit et al, 2004; Burns et al, 1999).

Also, conceptual framework has different purposes. It helps researchers to see the variables of the study clearly, it provides researchers with a general framework for data analysis, and it is essential in the preparation of a research proposal using cross sectional design methods. The conceptual framework also summarizes the major dependant and independent variables in the research, and it gives direction to the study (Smyth, 2004).

The major concepts of the current framework focus on quality of life as a dependent variable and other variables as independent variables such as the socio-demographic data which includes age, sex, place of residency, social status, educational level, economic status, depression, medical history including duration of diabetes mellitus, seeking psychotherapy to treat psychological problems and complications of diabetes as seen in figure (3.1). Each concept will be discussed in more details below.

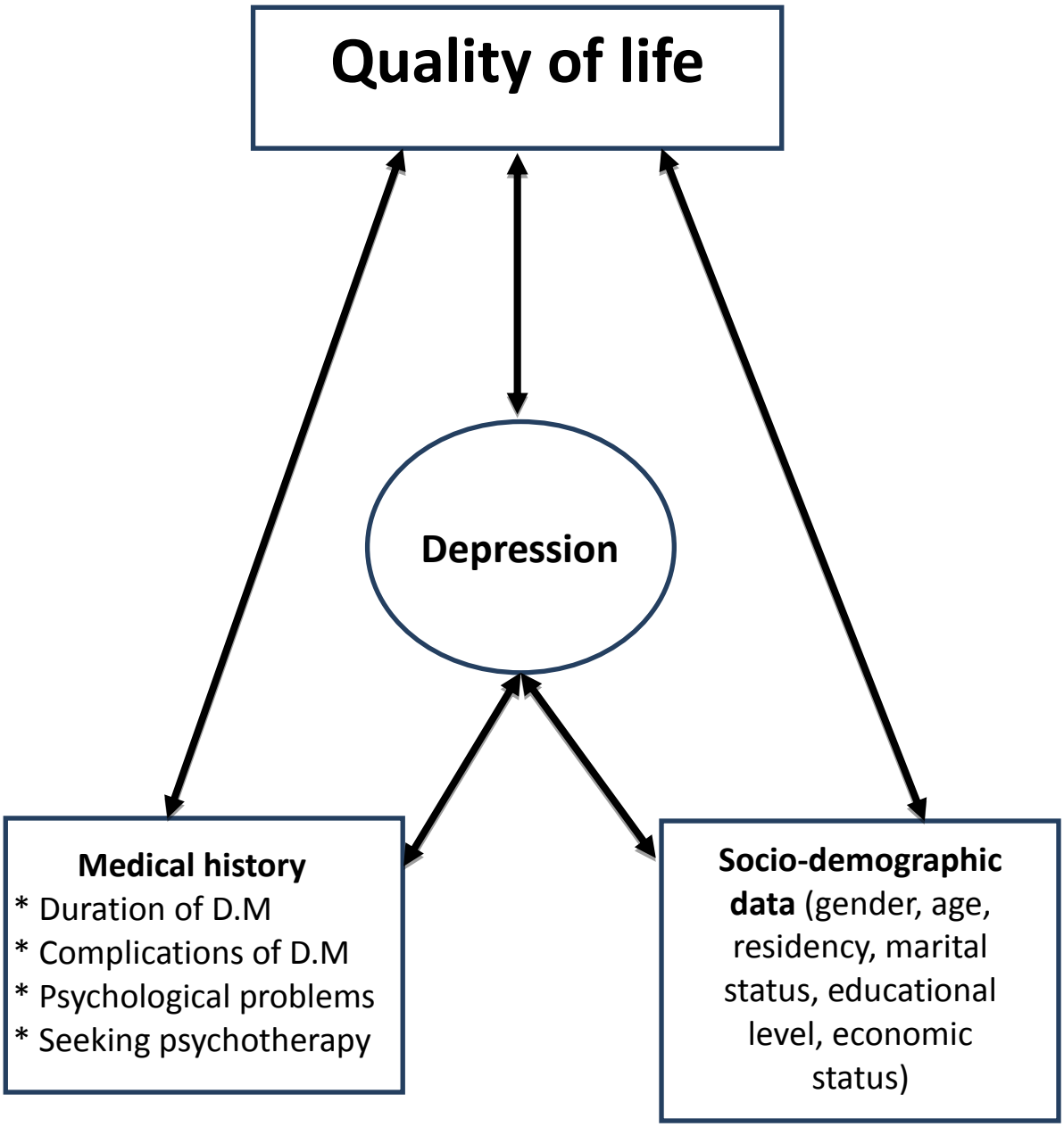

Figure (3.1): Framework of current study including quality of life and independent variables.

3.2. Dependent variable: Quality of life

As mentioned in previous chapter, WHO defined quality of life as "an individual' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independent, social relationships, and their relationships to salient features of their environment" (WHO, 1997; Bowling, 2003). Also, the Center of Disease Prevention and Control (CDC) defined quality of life as "a broad multidimensional concepts that usually includes self-reported measures of physical and mental health" (CDC, 2012).

Quality of life is assessed in the current study by using WHOQOL-BREF which is an abbreviated 26-item version of the WHOQOL-100 containing items that were extracted from the WHOQOL-100 field trial data and was developed by WHO (1997) (see appendix A). The WHOQOL-BREF contains one item from each of the 24 facets of QOL included in the WHOQOL-100, plus two ‘benchmark’ items from the general facet on overall QOL and general health. The four domain scores denote an individual’s perception of quality of life in each particular domain including physical (7 questions), psychological (6 questions), social relationships (3 questions) and environmental (8 questions)) (WHO. 1997). These domains and their related questions numbers and components are shown in table (3.1).

Table (3.1): The major domains and facets incorporated within each domains of quality of life and the questions that assessed these facets and domains.

Domain	Facets incorporated within domains	Q. N that assess these facets	Main question that assess the facets incorporated within domains
1. Physical health domain (included 7 questions)	Activity of daily living.	Q 17	How satisfied are you with your ability to perform your daily living activities?
	Dependence on medicinal substances and medical aids.	Q 4	How much do you need any medical treatment to function in your daily life?
	Energy and fatigue.	Q 10	Do you have enough energy for everyday life?
	Mobility.	Q 15	How well are you able to get around?
	Pain and discomfort.	Q 3	To what extent do you feel that physical pain prevents you from doing what you need to do?
	Sleep and rest.	Q 16	How satisfied are you with your sleep?
	Work capacity.	Q 18	How satisfied are you with your capacity for work?
2.Psychological health and body image and appearance domain (included 6 questions)	Bodily image and appearance.	Q 11	Are you able to accept your bodily appearance?
	Negative feelings.	Q 26	How often do you have negative feelings such as blue mood, despair, anxiety, depression?
	Positive feelings.	Q 5	How much do you enjoy life?
	Self-esteem.	Q 19	How satisfied are you with yourself?
	Spirituality / Religion / Personal beliefs.	Q 6	To what extent do you feel your life to be meaningful?
	Thinking, learning, memory and concentration.	Q 7	How well are you able to concentrate?

3. Social relationships domain (included 3 questions)	Personal relationships.	Q 20	How satisfied are you with your personal relationships?
	Social support.	Q 22	How satisfied are you with the support you get from your friends?
	Sexual activity.	Q 21	How satisfied are you with your sex life?
4.Environment and financial resources domain (included 8questions)	Financial resources.	Q 12	Have you enough money to meet your needs?
	Freedom, physical safety and security.	Q 8	How safe do you feel in your daily life?
	Health and social care: accessibility and quality.	Q 24	How satisfied are you with your access to health services?
	Home environment.	Q 23	How satisfied are you with the conditions of your living place?
	Opportunities for acquiring new information and skills.	Q 13	How available to you is the information that you need in your day-to-day life?
	Participation in and opportunities for recreation / leisure activities.	Q 14	To what extent do you have the opportunity for leisure activities?
	Physical environment (pollution/ noise /trafic /climat).	Q 9	How healthy is your physical environment?
	Transport.	Q 25	How satisfied are you with your transport?

During development of the WHOQOL-100, four types of 5-point Likert interval scale were designed and tested to reflect intensity, capacity, frequency and evaluation, and one of these was attached to each item. These response scales were also used in the WHOQOL-BREF. Items inquire ‘how much’, ‘how completely’, how often’, ‘how good’ or ‘how satisfied’ the respondent felt in the last 2 weeks and different response scales are distributed across the domains (Skevington et al. 2004).

3.3. Independent variables:

In the current study, independent variables included socio-demographic data (such as age, sex, place of residency, marital status, educational level and economic status), depression and medical history including duration of diabetes, complications of diabetes, psychological problems, and seeking psychotherapy. Questions number 1 to 10 in the questionnaire were designed to assess these variables (See appendix B).

3.3.1. Socio-demographic variables:

These variables were presented in section one of the questionnaires (question 1-6) and were studied by Al Soweilem & Elzubier (1998), Munger (2007), Kressin (2007) including the following:

1) Age: Which is defined as the completed age in years of the enumerated person, which is the difference between the date of birth and the date of interview. The exact age is the time elapsed between the day of birth and a given day, including parts of a year (Palestinian Central Bureau of Statistics. 2004**)**. Respondents in the current study were classified into three age groups which were 15 years to less than 18 years, 18 years to less than 21 years, and 21 years to 24 years, and question number (1) in the questionnaire assessed this.

2) Sex: American Psychology Association (2011) defined sex as refers to a person's biological status and is typically categorized as male and female. Question number (2) assessed this variable in the questionnaire as male or female.

3) Place of residency: It refers to the name of the locality in which the person spends most of his time during the year (lived there six months and above), irrespective of whether it is the person's same place of existence during the census, or the place in which he works and performs related activates or the place is his original place (Palestinian Central Bureau of Statistics. 2012). In the current study, a question number (3) assessed this as village**,** camp and city.

4) Marital status: It is defined as the status of those 12 years old and over in terms of marriage traditions and laws in the country (Palestinian Central Bureau of Statistics, 2012*).*

Marital status in the current study was divided into 4 categories: single**,** married, divorce**,** widow, and question number (4) assessed this.

5) Educational level: It referred to the highest successfully completed educational attainment level, the educational level for persons aged 10 years and over (Palestinian Central Bureau of Statistics. 2012). In this study it had 4 categories, and question number (5) assessed this as the following:

A. Illiterate.
B. Primary (1- 6 study years).
C. Preliminary (6 – 9 study years).
D. Secondary school (10 – 12 study years).
E. University.

6) Economic status: It defined as cash or in kind revenues for individual or household within a period of time; could be a week or a month or a year (Palestinian Central Bureau of Statistics, 2012**)**. In the current study it had 5 categories of the monthly income for a family, and question number (6) assessed this as the following:

A. No income.
B. Less than 1000 NIS.
C. 1000 to less than 2000 NIS.
D. 2000 to 3000 NIS.
E. More than 3000 NIS.

3.3.2. Medical history:

It was assessed through questions (q 7 – q 10) such as duration of diabetes, if they encounter any of the diabetes complications, if they suffered from any psychological problems, and if they seek psychotherapy to treat their psychological problems in the past. This section enabled us to quantify the effects of the different aspects of the patient medical history on his or her quality of life and were studied by Al-Soweilem & Elzubier (1998), Coyne (2007) Tozawa et al. (2002) Nuesch et al (2001), Ayumu & Fujita (2003), Munger (2007), Kressin (2007), and Boris & wijk (2009).

A: Duration of diabetes

Duration of diabetes is defined as how long the patient has been living with the disease (Wridat. 2011) and it was assessed by many previous studies such as Al-Soweilem & Elzubier (1998), Nuesch et al. (2001), Bovet et al. (2002), Ayumu & Fujita (2003), Cramer (2008), and Jin (2008). In the current study, question (7) assessed the duration of diabetes as the following:

A. Less than 6 months
B. 6 months – less than one year
C. One year – less than 3 years
D. More than 3 years

B: Complication

Complication is an unanticipated problem that arises and is a result of a procedure, treatment, or illness. A complication is named because it complicates the situation (Al-Soweilem & Elzubier. 1998). In the current study, question (8) was used to assess the complications as the following:

Have you got any of diabetes complications?

A. Eye complications.
B. Kidney complications.
C. Nervous system complications.
D. Heart complications.
E. Foot complications.
F. Other problems (mention them) …….

C: Psychological problems:

In the current study, question (9) was created to assess psychological problems of juvenile diabetes mellitus. The question was: Do you suffer from any psychological problems in addition to diabetes mellitus? Yes / No.

D: Seeking psychotherapy:

Also study question (10) was used to assess seeking psychotherapy. The question was: Did you go to the psychotherapy to treat your psychological problems in the past? Yes / No.

3.3.3. Depression:

It is a mental disorder that is characterized by a low mood accompanied by low self esteem and by loss of interest or pleasure in normally enjoyable activities. Moreover, there are other symptoms covered an additional criteria such as: Significant change in weight/ appetite, insomnia/ hypersomnia, psychomotor agitation, retardation, fatigue, difficulty concentrating, feelings of guilt or worthlessness, suicide ideation (DSM-IVTR, 2000). The symptoms of depression must persist for most of the day, nearly every day for at least 2 weeks. In addition, those symptoms must be accompanied by clinical significant distress or impairment in social, occupational, or other important areas of functioning (DSM-IVTR, 2000).

In the current study, Beck depression Inventory (BDI) was utilized to assess depression and it included 21 questions (See Appendix C). BDI assesses the depression symptoms as the following: Question 1, the severity of sadness; question 2, pessimism; question 3, past failure; question 4, loss of pleasure; question 5, feeling of guilt; question 6, feeling of punishment; question 7, self-dislike; question 8, self-criticalness; question 9, suicidal thoughts or wishes; question 10, crying; question 11, agitation; question 12, loss of interest; question 13, indecisiveness; question 14, worthlessness; question 15, loss of energy; question 16, change in sleep pattern; question 17, tiredness or fatigue; question 18, change in appetite; question 19, weight loss; question 20, health worried; and question 21, loss of interest in sex (Beck, 1961).

Finally, Beck depression scores were classified into four categories to assess depression level as the following:

Range	Score
Minimal	0 -13
Mild	14 -19
Moderate	20 – 28
Severe	29 - 63

Also, the cutoff score of ≥ 16 was used to assess clinical depression in diabetic population in the current study (Lusman et al. 1997).

The next chapter discussed methodology of the current study.

3.4. Summary

- This chapter presented the conceptual framework which was developed based on literature review.

- It consisted of two major concepts: Dependent variables including quality of life, and independent variables including socio-demographic variables such as **(**age, gender, place of residency, marital status, educational level and economic status), depression and medical history such as duration of diabetes, and complication of diabetes.

Chapter Four

Methodology

Chapter four

4.1. Introduction

This study aimed to examine the quality of life and depression among youth with juvenile DM type 1. To achieve this purpose, a cross sectional design was utilized. Instruments were used for data collection, and data processing and analysis had been followed.

4.2. Study design

Quantitative research is a formal, objective, rigorous, and systematic scientific process for gathering information or for investigating quantifiable properties, phenomena and relationships. It involves a collection of numerical data where often there is considerable control and analysis of data by using statistical procedures (Burns et al. 1999; Polit et al. 2004). The objective of quantitative research is to develop and employ mathematical models, theories and hypotheses, and it is used widely in social science such as psychology, social work, sociology, nursing and political science (Polit & Beck, 2004).

In the current study, a cross-sectional design was utilized using self-reported questionnaires because it is highly useful for descriptive purposes, and it shows both the determining factors and the outcome at the same time. Moreover, it is less expensive and it saves time and effort (Polgarr & Thomas, 1997).

On the other hand, the cross-sectional design has many limitations: it does not lend to generalization of the result, it may not enable researchers to make causal inferences, and it is not appropriate for incident estimation especially in the case of long-lasting outcomes (Dimer, 1997).

4.3. Study population and sample size

The target population of this study was youth with juvenile diabetes mellitus aged 15-24 years old who attended 20 UNRWA clinics in West Bank. The total population of the study was 164 and 23 patients of them were excluded as the following: 4 patients were dead, 3 patients were married and traveled out of the country and 16 patients refused to fill in the questionnaire when they were called by phone to take their permission to participate in the study. So, a total of 141 questionnaires was filled in by 141 patients (see table 4.1) and the response rate was 100%. As the total population was included, no sampling method was used in the current study.

4.4. The inclusion criteria were:

1) Youth with juvenile DM type 1.
2) Participants aged 15 to 24 years old.
3) Participants who attended the UNRWA clinics in West Bank.

4.5. The exclusion criteria were:

1) Participants who had another chronic physical illness, such as asthma, hypertension, cancer ….. etc.
2) Participants with Type 2 diabetes.
3) Pregnant women with gestational diabetes mellitus.
4) Participants with mental disorders like severe depression, schizophrenia, and mental retardation, because the limited cognitive abilities of these individuals may affect their ability to fill in the questionnaire.

4.6. Setting of the study

The study was conducted in all the 20 UNRWA primary health care clinics in West Bank (see table 4.1). UNRWA clinics provide diabetes and hypertension care since 1992 in its primary health care centers (UNRWA. 2015). Also, UNRWA clinics provide medical care for diabetic patients including drugs, psychological counseling, education and knowledge

about diabetes, its complications and treatments. Finally, UNRWA has a partnership with private centers in all West Banks to refer diabetes patients after being diagnosed for further treatment (Al-abed et al. 2014).

Table (4.1): The name of UNRWA clinics, their location, and the number of the participants in West Bank

Area	Clinics name	City name	Number of participants
Middle area	Jalazone Camp	Ramallah	**8**
	Amari Camp	Ramallah	**13**
	Kalandia Camp	Jerusalem	**11**
	Aqbet Jabber Camp	Jericho	**12**
	Ain Al Sultan Camp	Jericho	**7**
	Biet Soriek Village	Jerusalem	**9**
	Shoufat Camp	Jerusalem	**7**
	Mobile Clinics	Ramallah**,** Jericho**,** Jerusalem	**5**
Total	**8 Clinics**		**72 participant**
	Askar Camp	Nablus	**7**
	Balata Camp	Nablus	**8**
	Camp No 1	Nablus	**3**
	Tulkarem Health Center	Tulkarem	**6**

North area	Nurshams Camp	Tulkarem	**8**
	Jenin Camp	Jenin	**6**
	Qalqilia City	Qalqilia	**7**
	Fareaa Camp	Jenin	**5**
Total	**8 Clinics**		**50 participant**
South area	Dora Camp	Hebron	**4**
	Al-Fawar Camp	Hebron	**3**
	Mobile Clinics	Hebron and Bethlehem	**5**
	Shams Center of Excellence	Bethlehem	**7**
Total	**4 Clinics**		**19 participant**

4.7. Instrument of the current study

Data collection tools used in this study were self-administrated questionnaires including socio demographic self-administrated sheet, Beck Depression Inventory Scale and Quality of Life Scale as seen in table (4.2).

Table (4.2): Instruments of the current study and the numbers of their questions

No.	Instruments	Number of questions in each instruments
1.	Socio-demographic self-administration sheet including medical history	▪ 6 questions for socio- demographic data. ▪ 4 question for medical history.
2.	Beck Depression Inventory scale	▪ 21 questions
3.	Quality of life scale	▪ 26 questions

Each one of the study instrument is discussed in more details as the following:

- Socio-demographic self-administrated sheet was developed for the purpose of this study and it included independent variables such as gender, age, place of residency, marital status, educational level, economic status and medical history including duration of DM, complication of diabetes, history of psychological problems and seeking psychotherapy as mentioned in chapter three.

- Beck Depression Inventory (BDI) and was developed by Aaron T. Beck in the year 1961. BDI includes 21 items which were modified later and developed to measure the intensity and severity of depression symptoms as listed in the (Beck, 1961). The items assess sadness, pessimism, past failure, loss of pleasure, feeling of guilt, feeling of punishment, self dislike, self criticalness, suicidal thoughts or wishes, crying, agitation, loss of interest, indecisiveness, worthlessness, loss of energy, change in sleep pattern, tiredness or fatigue, change in appetite, weight loss, health worried, and loss of interest in sex. Items 1 to 13 assess psychological symptoms while items 14 to 21 assess physical symptoms. The participants were asked to consider each statement as it relates to the way they have felt for the past two weeks. There is a four point scale for each item ranging from 0 to 3. The total score

of 0-13 is considered minimal range, 14-19 is mild, 20-28 is moderate, and 29-63 is severe (Beck, et al, 1961).

- Quality of life scale (QOL) which was developed by the World Health Organization (WHO) in 1994. It covers the four domains of QOL which are physical health, psychological, social relationships, and environment as shown in table (4.3):

Table (4.3): WHOQOL-BREF domains

Domain	Facets incorporated within domains
1. Physical health	▪ Activities of daily living ▪ Dependence on medicinal substances and medical aids ▪ Energy and fatigue ▪ Mobility ▪ Pain and discomfort ▪ Sleep and rest ▪ Work Capacity
2. Psychological	▪ Bodily image and appearance ▪ Negative feelings ▪ Positive feelings ▪ Self-esteem ▪ Spirituality / Religion / Personal beliefs ▪ Thinking, learning, memory and concentration
3. Social relationships	▪ Personal relationships ▪ Social support ▪ Sexual activity
4. Environment	▪ Financial resources ▪ Freedom, physical safety and security ▪ Health and social care: accessibility and quality ▪ Home environment ▪ Opportunities for acquiring new information and skills ▪ Participation in and opportunities for recreation / leisure activities ▪ Physical environment (pollution / noise / traffic / climate) ▪ Transport

4.8. Reliability and validity of the instrument

Reliability refers to the stability or consistency of information that is obtained when a measurement is performed more than once. It also can be defined as the degree to which an instrument yields the same data each time it used under the same conditions and with the same subjects (Polgarr, et al., 1997).

There are two ways by which reliability is commonly estimated: (1) test/retest, which checks whether repeating the test questionnaire under the same conditions produces the same results, and (2) internal consistency. For the purpose of the current study, the second method, internal consistency was utilized (Polgarr, et al., 1997). Cronbach's Alpha coefficient is one of the most common means of estimating the internal consistency of items in a scale. Rubin and Bobbie (2005) indicated that when alpha coefficients level is about 90 or above, the internal consistency reliability is considered to be excellent. When the alpha coefficient level is from 0.80 to 0.89, reliability is considered to good. The acceptable reliability level is 0.7. In the current study; Cronbach Alpha was calculated to measure the reliability by using SPSS and it was found to be 0.89 for the Beck Depression Scale and 0.91 for the Quality of Life Scale.

Validity refers to the adequacy with which the method of measurement is able to measure the issues or phenomena under study (Abramson, 1999). Cook and Campbell (1979) defined validity as the best available approximation to the truth or falsity of given inference, proposition or conclusion.

Content validity of the questionnaires was examined by a committee of three experts in mental health and public health who hold doctoral degree (PhDs). Two of them were from Al Quds University, and one of them was from Birzeit University. No changes were required by them regarding the language or the content. In addition, to achieve the aim of this study, the Beck Depression Inventory Scale was translated into Arabic language by the researcher and a back translation was done by an English translator after doing content validity.

4.9. Data collection process

After sending a formal letter to the head of Health Department at UNRWA explaining the purpose of the study, permission was granted on September 2013.

After that, the researcher trained 20 counselors who work in the UNRWA clinics in West Bank on how to fill in the questionnaire in order to answer participants' questions while filling in the questionnaires and to help in data collection. The purpose of the study, the items of the questionnaire, the inclusion and exclusion criteria of the study and ethical considerations were discussed with them.

The main researcher called all the participants and the parents of the participants who were less than18 years old (54 participants) by phone to explain the purpose of the study and to get a verbal permission to participate in the study.

The researcher and the counselors started interviewing the participants who agreed to participate and to fill in the questionnaires in the UNRWA clinics and 27 of the participants asked to fill in the questionnaires by themselves in their houses. The data collection process took two months started on the first of September 2013 and finished at the end of October 2013. The medical teams in these clinics were very helpful and cooperative which played a crucial role in obtaining a high response rate.

The total number of the questionnaires that were filled in by the presence of the researcher was 57 questionnaires and the rest were filled in by the presence of the counselors in UNRWA clinics or their homes (84 questionnaires).

4.10. Statistical analysis

The data was analyzed by using the statistical package for Social Sciences (SPSS) version 18.0. The data were checked for entry errors (data clearance). The relationship between socio demographic data, Beck Depression Inventory Scale (BDI), and Quality of Life (QOL) were analyzed by the using parametric test such as frequency, T-test, ANOVAs test and Pearson test.

4.11. Ethical considerations

Ethical approval was obtained from Al-Quds University. Participants were provided with the information sheet about the study including the aim of the study; objectives, procedures, and they were informed that they had the rights to refuse to participate in the study.

The general director of health department in UNRWA was formally approached via an introductory letter which presented information about the proposed study and its purpose. He was asked to give his permission to conduct the study in UNRWA clinics, and the response was positive. Before starting the survey, the proposal was also submitted to the Public Faculty at Al-Quds University and approval to conduct this study according to the thesis preparation guide of the Factually of Graduate Studies was obtained.

Confidentiality and privacy were assured for all participants and they were informed that all information would be kept strictly confidential. In addition, data was protected and appropriately stored; all files were stored on computer and were protected by a password and nobody was allowed to access it except the researcher and the supervisor. No names or codes or any other mechanisms were used to trace responses back to an individual participant.

Finally, the main researcher took permission verbally from all the participants and from the participants' parents who were less than18 years old in order to participate in the current study.

The next chapter discuses the results of the current study.

4.12. Summary

- A cross-sectional design was utilized in this study because it is cheap, quick and ethically safe.

- The data collection tools used in this study were self-reported questionnaires including socio demographic data sheet, Beck Depression Inventory (BDI) and Quality of Life Scale (QOL).

- The data was processed through SPSS statistical package testing. This was done according to international and local standards of research taking into consideration the ethical and scientific rules and obligations.

- Validity of the questionnaires was examined by a committee of three experts in mental health and public health from Al Quds University and Birzeit University. Reliability of the instruments was tested by using Cronbach,s Alpha coefficient and the result was found to be 0.89 for the Beck depression scale and 0.91 for the quality of life scale.

- The total population of the study was 164 patients with type 1 diabetes mellitus, excluded 4 patients who were dead, 3 patients who were married and traveled out of the country, and 16 patients refused to fill in the questionnaire. So141 participants accepted to fill in the questionnaires.

- Different ethical issues including consent forms and confidentiality were discussed.

Chapter Five

Results

Chapter five

5.1. Introduction

As mentioned in previous chapter, a cross sectional study was utilized. The total population of youth with juvenile D.M (type 1) was 164 patients at UNRWA clinics in the West Bank. From these participants, 141 participants agreed to participate in the study with a response rate of 100%. Data was collected by: QOL-Brief Questionnaire for quality of life and Beck Inventory Scale for depression.

This chapter presented the findings of the current study as the following:

1) Description of the characteristics of the participants and medical history.

2) The results of QOL-Brief Questionnaire and Beck Depression Inventory Scale.

5.2. Section one: The characteristics of the participants and medical history:

The baseline data analysis showed that 141 respondents returned the questionnaires, 51.8% (n=73) were males, and 48.2% (n=68) were females (see figure 5.1).

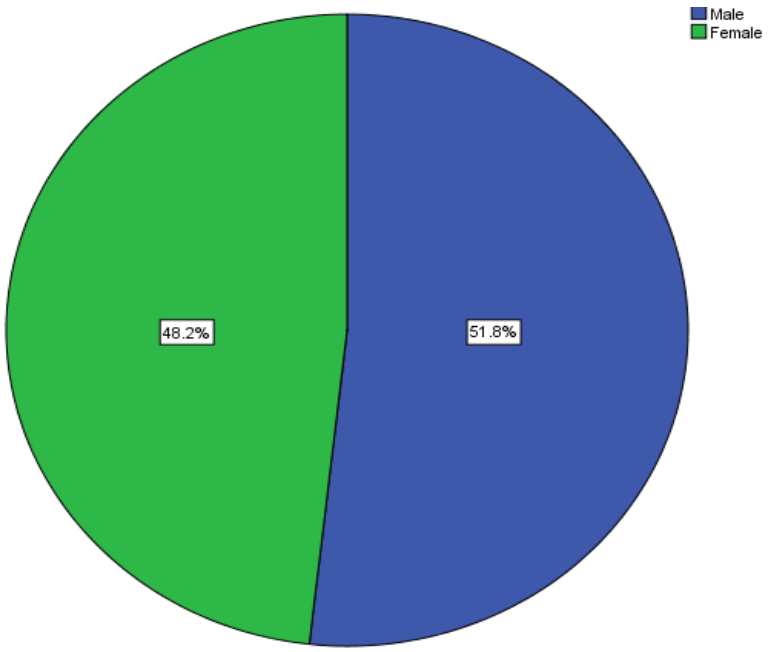

Figure (5.1): The distribution of the participants by the gender

Also, 38.3% (n=54) of the participants were from 15 years old to less than 18 years old, 27.7% (n=39) were from 18 years old to less than 21 years old, and 34.0% (n=48) were from 21 years old to 24 years old (see figure 5.2).

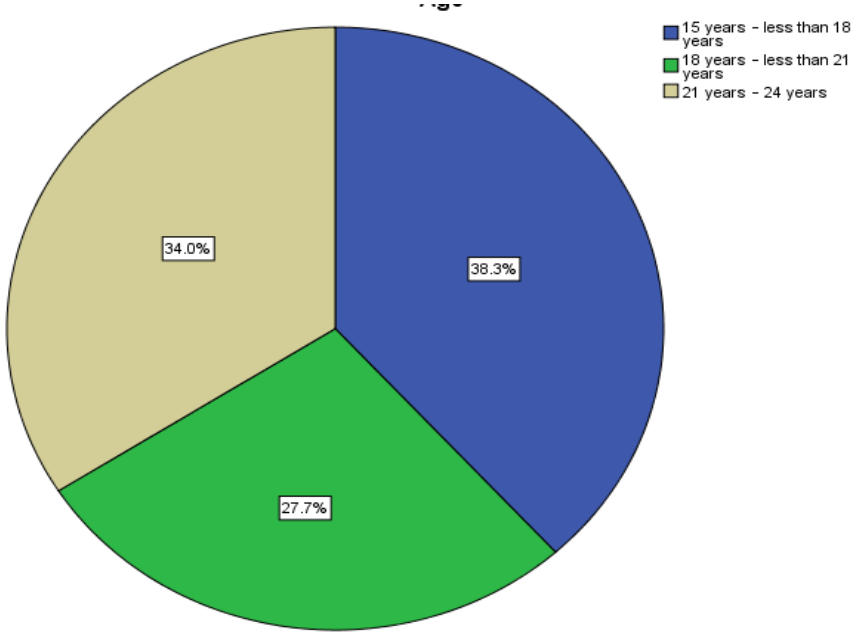

Figure (5.2): The distribution of participants by the age

Furthermore, 42.6% (n=60) of the participants lived in a village, 31.9% (n=45) were from the refugee camps, and 25.5% (n=36) were from a city (see figure 5.3).

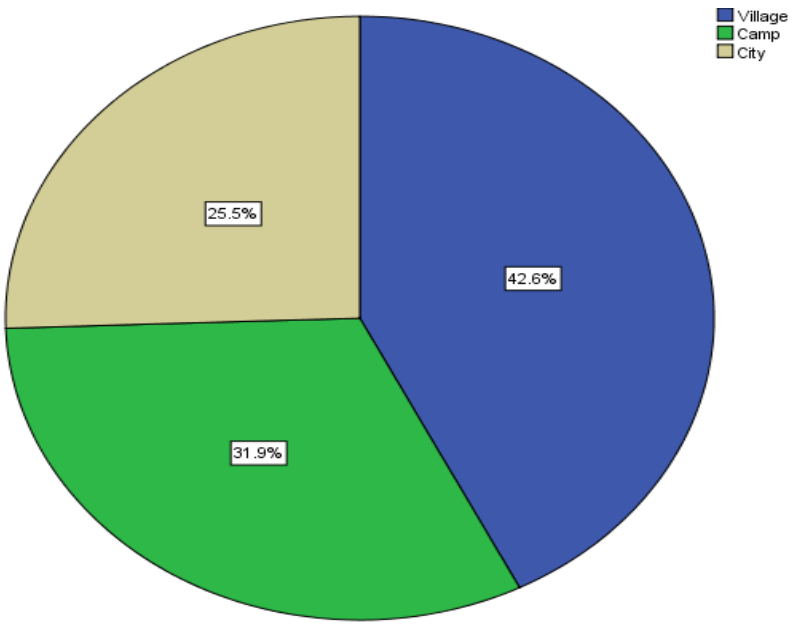

Figure (5.3): The distribution of the participants by the place of residency

For the marital status, 87.2% (n=123) of the participants were single, 11.3% (n=16) were married, and 1.4% (n=2) were divorced (see figure 5.4).

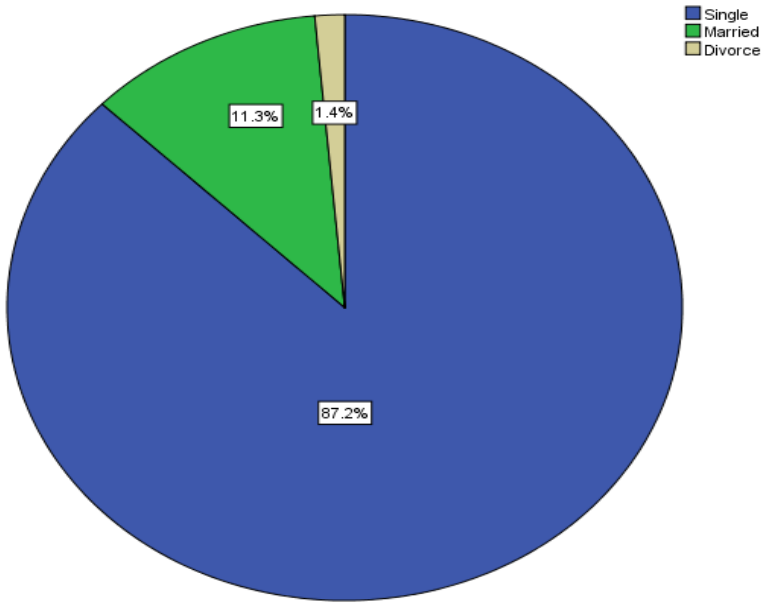

Figure (5.4): The distribution of the participants by the marital status

As the age group of the participants ranged from 15-24 years old, the educational level of the participants ranged from illiteracy to university level as shown in figure (3.5). For example, 0.7% (n=1) of the participants was illiterate, 4.3% (n=6) had primary education, 35.5% (n=50) had elementary education, 28.4% (n=40) had secondary education, and 31.2 (n=44) had a bachelorette degree (BA) (see figure 5.5).

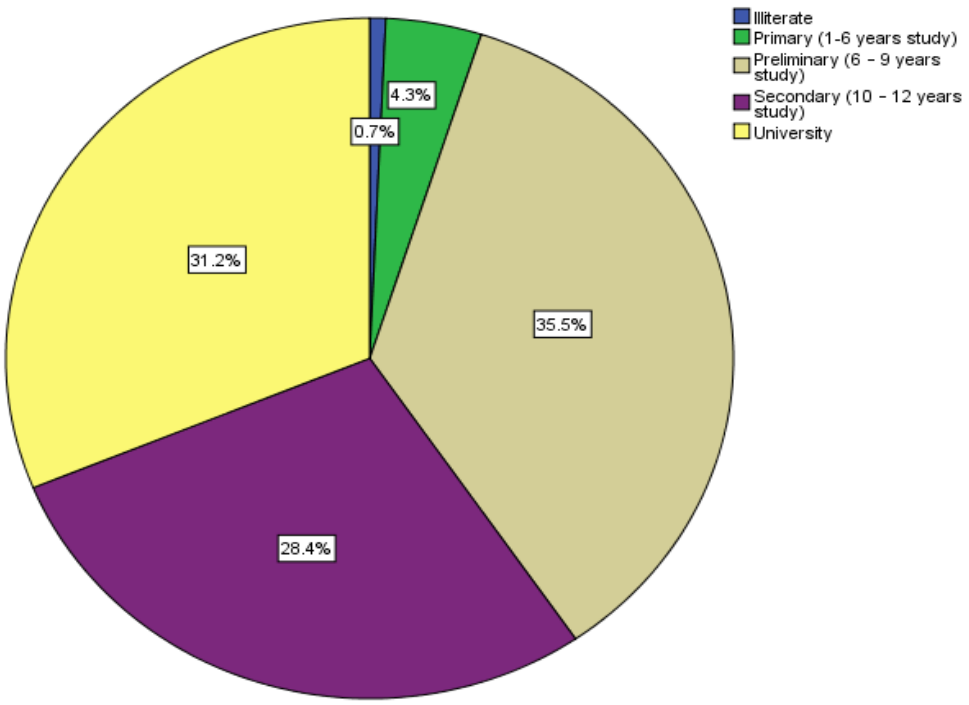

Figure (5.5): The distribution of the participants by the educational level

Also, the economic status of the family participants ranged from no income to more than 3,000 NIS as shown in figure (3.6). For example, 10.6% (n=15) of them had no income, 14.2% (n=20) had less than 1,000 NIS, 36.2% (n=51) had 1,000 NIS to less than 2,000 NIS, 27.7% (n=39) had 2,000 NIS to 3,000 NIS, and 11.3% (n=16) had more than 3,000 NIS (see figure 5.6).

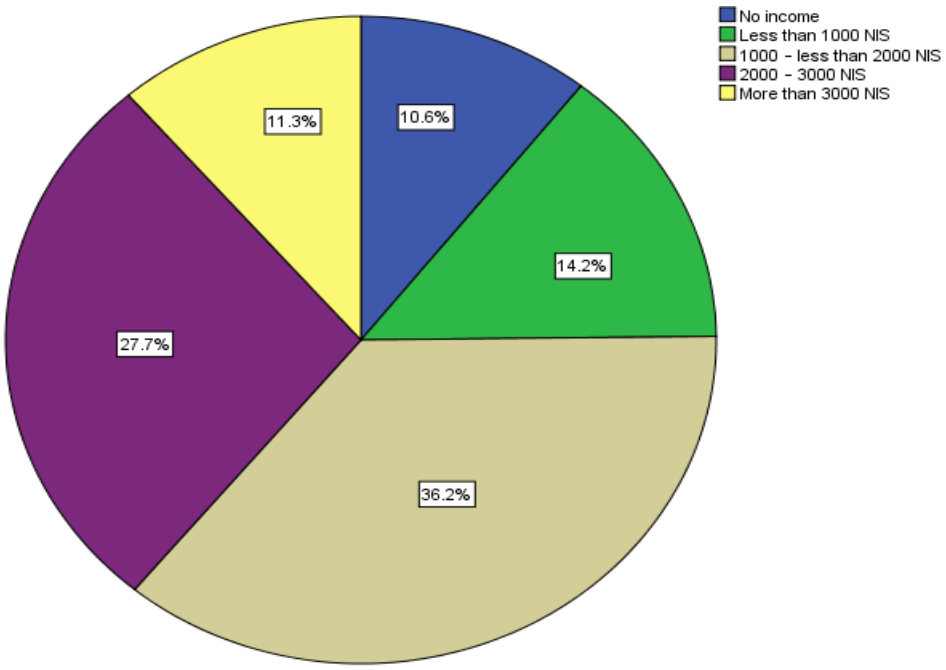

Figure (5.6): The distribution of the participants by the family economic status

Further, 4 questions related to participants' medical history were examined. For example, the duration of illness was classified into four groups; those who were ill for less than 6 months, those who were ill from 6 months to less than one year, those who were ill for one year to less than 3 years, and those who were ill for more than 3 years. Findings showed that 2.8% (n=4) of the participants reported that their duration of illness was less than 6 months, 9.2% (n=13) reported from 6 months to less than one year, 14.2% (n=20) reported from one year to less than 3 years, and 73.8% (n=104) stated more than 3 years (see figure 5.7).

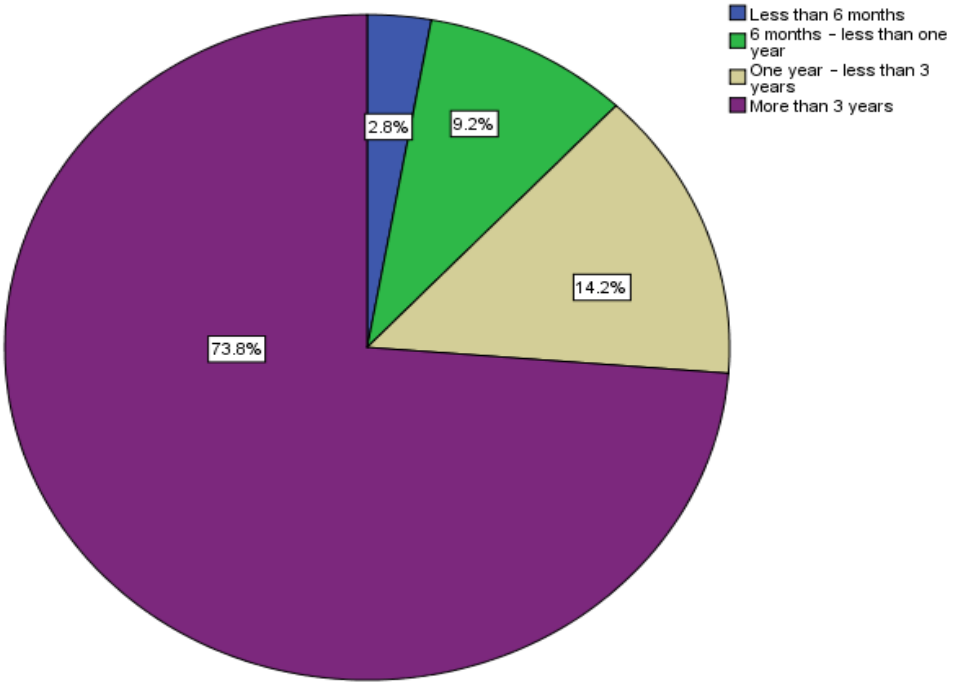

Figure (5.7): The distribution of the participants by the duration of illness

Also, the participants were asked if they suffered from any complications caused by diabetes. Only 31.2% (n=44) of the participants reported that they suffered from diabetes complications and the majority (68.8%, n=97) did not suffer from any complications (see figure 5.8). For example, one third of the participants (31.8%, n=14) had eye complications, (4.5%, n=2) had kidney complications, (6.8%, n=3) had nervous system complications, (4.5%, n=2) had heart complications, (6.8%, n=3) had foot complications, and (2.2%, n=1) had liver complications. Also 13.6% (n=6) of them reported other problems such as hypoglycemia induced coma, and amputation. Some participants reported a combination between two or more of the complications such as nervous system with feet complications, eye with kidney complications, eye with feet complications, and eye with feet and with nervous system complications.

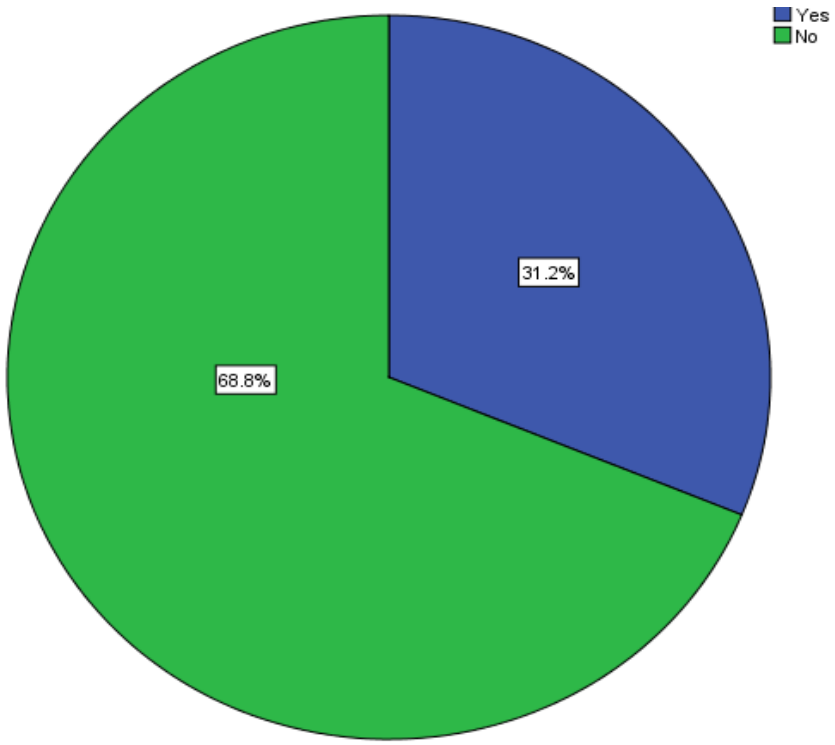

Figure (5.8): The distribution of the participants according to diabetes complications

Moreover, the participants were asked if they suffered from any psychological problems in addition to diabetes mellitus and the findings showed that 68.8% (n=97) reported that did not have any psychological problems and 31.2% (n=44) reported that they suffered from psychological problems as seen in figure (5.9). These problems included tension, isolation, family problems, fears, neglect, self-loneliness, pessimism, frustration, and aggressiveness, weakness in education, nervousness, sleeplessness, anxiety and fears of amputation.

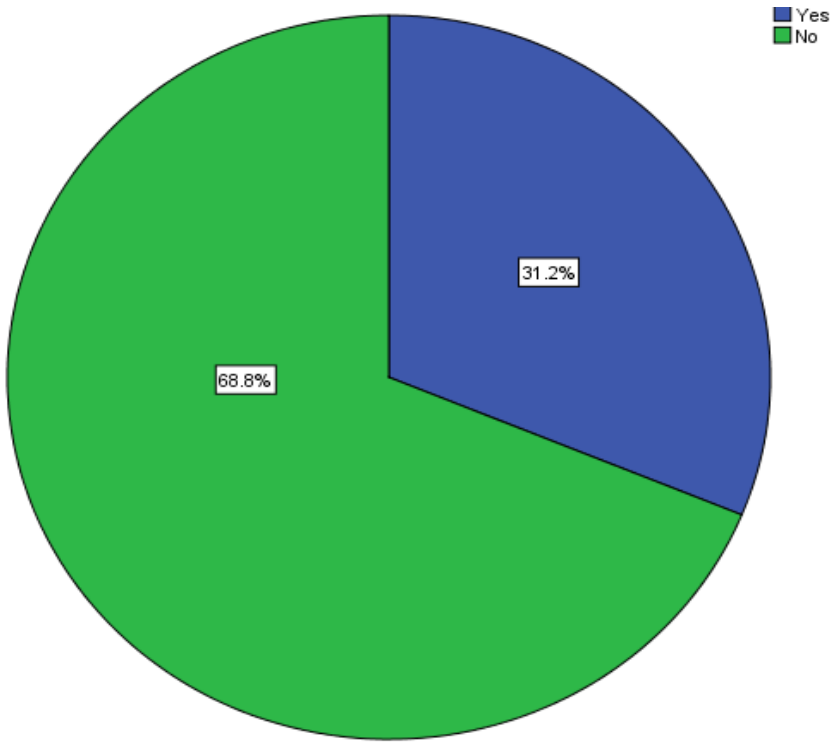

Figure (5.9): The distribution of the participants by the presence of psychological problems

Moreover, the participants were asked if they seek psychotherapy to treat their psychological problems and 80.9% (n=114) of them reported that they did not seek psychotherapy to treat their psychological problems, and only 19.1% (n=27) of the participants tried psychotherapy (see figure 5.10). In addition, the participants were asked about the counseling centers which they attend to treat their psychological problems and they stated as the following: Community Mental Health Program at UNRWA, private clinics, Traumatic Rehabilitation Center (TRC), Palestinian Ministry of Health Centers, Ebin Al Haitham Hospital at Jordan, YMCA, and Doctors without Borders.

Regarding the reasons that prevented the participants from seeking psychotherapy, the results showed that more than one third of the participants (33.3%, n=38) reported that they did not need psychological services, 27.1% (n=31) were afraid from stigma, 14.9% (n=17) did not know the places that offered these services, 14.0% (n=16) answered that psychotherapy was ineffective, (9.6%, n=11) indicated economic reasons, and a few of the participants (2.6%, n=3) reported other reasons but they did not mention them.

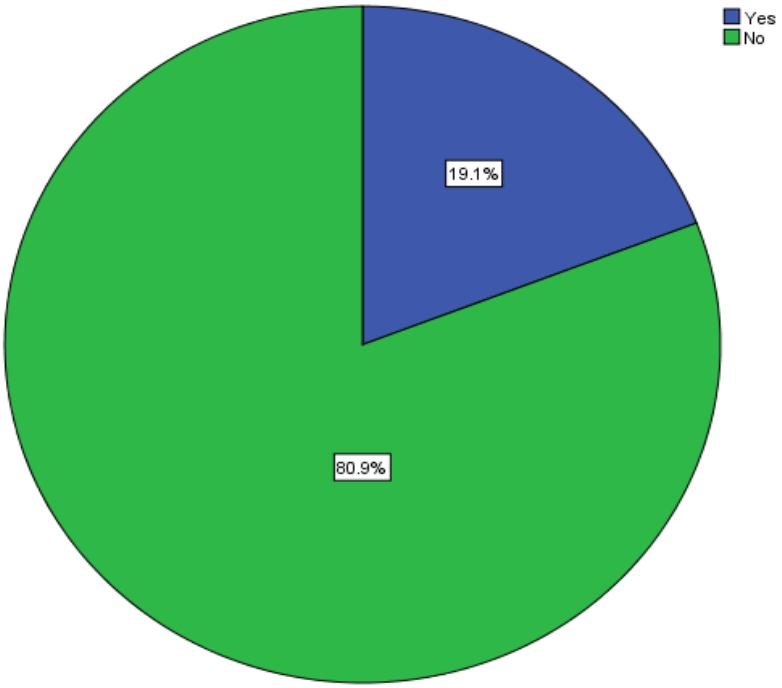

Figure (5.10): The percentages of the participants who seek psychotherapy in the past

5.3. Section two: The results of QOL- Brief questionnaires and Beck Inventory Scale.

This section consisted of two parts:

Part one: Quality of life related questions finding.

Part two: Depression related questions findings.

5.3.1. Part one: Quality of life related questions.

This part discussed quality of life, the major domains of quality of life findings and the relationship between the 4 domains of quality of life and other independent variables.

Quality of life

Twenty six questions were used to assess quality of life of youth with juvenile diabetes mellitus aged 15-24 years old and frequency and percentages were used to achieve this purpose. In general, findings showed that participants' responses varied between satisfied and very satisfied to other responses on the scale (see table 5.1). For example, the participants were asked about how they would rate their quality of life, and 47.5% (n=67) of them responded good and very good, 30.5% (n=43) responded neither poor nor good, and 21.9% (n=31) answered poor and very poor as seen in table (5.1).

Furthermore, the participants were asked if they were satisfied with their health, and 40.4% (n=57) reported being satisfied and very satisfied, 31.6% (n=46) said neither satisfied nor dissatisfied, and 26.9% (n=38) stated that as dissatisfied and extremely dissatisfied as seen in table (5.1).

For physical pain, the participants were asked about the extent to which physical pain prevented them from doing what they need to do, and 26.9% (n=38) indicated that as very much and extreme, 26.2% (n=37) answered moderate, and 47.6% (n=66) answered little and not at all as seen in table (5.1).

Also, 39.7% (n=56) of the participants indicated that they extremely enjoyed their lives, 34.0% (n=48) reported moderate, 26.3% (n=37) stated as little and not at all as seen in table (5.1).

Moreover, the participants were asked about whether they had enough money to meet their needs, and 34.8% (n=49) of participants reported moderately, 29.1% (n=41) reported mostly and completely, and 36.1% (n=51) answered little and not at all as seen in table (5.1).

In addition, 48.2% (n=68) of the participants answered good and very good when they were asked about how well they were able to get around, 26.2% (n=37) of them said neither poor nor good, and 25.6% (n=36) reported poor and very poor as seen in table (5.1).

When the participants were asked about how satisfied they were with their sleep, 50.3% (n=71) of them reported being satisfied and very satisfied, 27.7% (n=39) answered neither satisfied nor dissatisfied, and 22% (n=31) were dissatisfied and very dissatisfied as seen in table (5.1).

Furthermore, the participants were asked if they were satisfied with themselves, and 32.6% (n=46) responded neither satisfied nor dissatisfied, 44.7% (n=63) answered satisfied and very satisfied, and 22.7% (n=32) dissatisfied and extremely dissatisfied as seen in table (5.1).

Finally, less than half of the participants (46.8%, n=66) indicated quite often when they were asked about if they had negative feelings such as blue mood, despair, anxiety and depression, 19.9% (n=28) reported that as a very often, 19.1% (n=27) answered seldom, 8.5% (n=12) said always, and only 5.7% (n=8) stated that has never as seen in table (5.1).

Also, participants' responses were checked to assess which questions of QOL questionnaires had 60% or more of the participant's satisfaction and the results revealed only two questions (question number 11 and question number 23). For example, 61% (n=86) of the participants accepted their bodily appearance and 60.3% (n=85) were satisfied with the conditions of their living place.

In addition, the questionnaire was checked to assess the number of questions that gained 50% of the participants' positive (satisfied and very satisfied) responses. Findings revealed only 4 questions (question number 16, 17, 21 and 22) and other 18 questions had less than 50% of the participants' responses. For example, 50.3% (n=71) said that they were satisfied with their sleep, 53.9% (n=76) were satisfied with their ability to perform their daily living activities, 54.6% (n=77) were satisfied with their sex life, and 52.5% (n=74) were satisfied with the support that they got from their friends.

The questions that gained less than 50% of the participants' positive responses were q3 (physical pain), q4 (medical treatment), q5 (enjoying life), q6 (meaningful life), q7 (concentration), q8 (daily life safety), q9 (healthy physical environment), q10 (energy), q12 (money), q13 (available information), q14 (leisure activities), q15 (get around), q18 (work capacity), q19 (self satisfaction), q20 (personal relationships), q24 (health services access), q25 (transports), q26 (negative feelings) as seen in table (5.1).

Table (5.1): The participants' answers to the questions related to their quality of life (QOL-Brief Scale).

No.	Questions	Valid									
		Very poor		**poor**		**Neither poor nor good**		**good**		**Very good**	
1)	How would you rate your quality of life?	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
		15	10.6	16	11.3	43	30.5	46	32.6	21	14.9
2)	How satisfied are you with your health?	**Very dissatisfied**		**Dissatisfied**		**Neither satisfied nor dissatisfied**		**Satisfied**		**Very satisfied**	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
		12	8.5	26	18.4	46	32.6	41	29.1	16	11.3
3)	To what extent do you feel that physical pain prevents you from doing what you need to do?	**Not at all**		**A little**		**A moderate amount**		**Very much**		**An extreme amount**	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
		27	19.9	39	27.7	37	26.2	26	18.4	12	8.5
4)	How much do you need any medical treatment to function in your daily life?	15	10.6	22	15.6	43	30.5	38	27.0	23	16.3

5)	How much do you enjoy life?	8	5.7	29	20.6	48	34.0	41	29.1	15	10.6
6)	To what extent do you feel your life to be meaningful?	13	9.2	15	10.6	44	31.2	45	31.9	24	17.0
7)	How well are you able to concentrate?	5	3.5	30	21.3	57	40.4	40	28.4	9	6.4
8)	How safe do you feel in your daily life?	2	1.4	19	13.5	53	37.6	52	36.9	15	10.6
9)	How healthy is your physical environment?	9	6.4	29	20.6	42	29.8	45	31.9	16	11.3
10)	Do you have enough energy for everyday life?	**Not at all**		**A little**		**Moderately**		**Mostly**		**Completely**	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
		10	7.1	16	11.3	53	37.6	45	31.9	17	12.1
11)	Are you able to accept your bodily appearance?	4	2.8	13	9.2	38	27.0	55	39.0	31	22.0
12)	Have you enough money to meet your needs?	24	17.0	27	19.1	49	34.8	31	22.0	10	7.1
13)	How available to you is the	6	4.3	23	16.3	57	40.4	43	30.5	12	8.5

	information that you need in your day-to-day life?										
14)	To what extent do you have the opportunity for leisure activities?	17	12.1	39	27.7	50	35.5	29	20.6	6	4.3
15)	How well are you able to get around?	**Very poor**		**poor**		**Neither poor nor good**		**good**		**Very good**	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
		8	5.7	28	19.9	37	26.2	44	31.2	24	17.0
16)	How satisfied are you with your sleep?	**Very dissatisfied**		**Dissatisfied**		**Neither satisfied nor dissatisfied**		**Satisfied**		**Very satisfied**	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
		6	4.3	25	17.7	39	27.7	48	34.0	23	16.3
17)	How satisfied are you with your ability to perform your daily living activities?	6	4.3	12	8.5	47	33.3	59	41.8	17	12.1
18)	How satisfied are you with your capacity for work?	8	5.7	24	17.0	45	31.9	44	31.2	20	14.2

19)	How satisfied are you with yourself?	8	5.7	24	17.0	46	32.6	41	29.1	22	15.6
20)	How satisfied are you with your personal relationships?	8	5.7	25	17.7	40	28.4	48	34.0	20	14.2
21)	How satisfied are you with your sex life?	9	6.4	9	6.4	46	32.6	57	40.4	20	14.2
22)	How satisfied are you with the support you get from your friends?	12	8.5	17	12.1	38	27.0	49	34.8	25	17.7
23)	How satisfied are you with the conditions of your living place?	12	8.5	12	8.5	32	22.7	49	34.8	36	25.5
24)	How satisfied are you with your access to health services?	6	4.3	25	17.7	50	35.5	44	31.2	16	11.3
25)	How satisfied are you with your transport?	14	9.9	25	17.7	47	33.3	40	28.4	15	10.6
26)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	**Never**		**Seldom**		**Quite often**		**Very often**		**Always**	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
		8	5.7	27	19.1	66	46.8	28	19.9	12	8.5

5.3.1.2. Major domains of quality of life findings

As mentioned previously, quality of life has four domains; physical domain, psychological domain, social domain and environmental domain which were examined in the current study. Also, the participants were asked about their satisfaction with their quality of life in general. T-tests, frequency and percentage were used to achieve this purpose (see table 5.2).

The participants were asked about their satisfaction with the four domains of quality of life and in comparison with not being satisfied (which included the categories of not satisfied and (neither satisfied nor dissatisfied) of their responses), and the findings showed that 63.08% (n=89) of the participants were satisfied with their physical domain and 36.92% (n=52) were not satisfied. For the psychological domain, 65.06% (n=92) of them were satisfied and 34.94% (n=49) were not satisfied. For environmental domain, 66.43% (n=94) of the participants were satisfied and 32.34% (n=47) were not satisfied. Finally, for the social domain, 67.66% (n=95) of the participants indicated being satisfied and 33.57% (n=46) were not satisfied as seen in table (5.2).

Also, as seen in table (5.2) findings showed that the participants had the lowest QOL scores in the physical domain (mean=3.1540) then the psychological domain (mean=3.2530), the environmental domain (mean=3.3218), and finally the social domain (mean=3.3830) which had the highest mean.

Moreover, overall satisfaction of the participants with quality of life was 65.5% (n=93) and 34.5% (n=48) of the participants were not satisfied (mean= 3.27) as seen in table (5.2).

Table (5.2): The percentage, the frequency and the mean of the four domains of quality of life and other related questions

Domain	Satisfied		Not satisfied and(neither satisfied nor dissatisfied)		Mean	S. D
	Freq	%	Freq	%		
1) Physical domain	89	63.08%	52	36.92%	3.1540	.64389
2) Psychological domain	92	65.06%	49	34.94%	3.2530	.66386
3) Social domain	95	67.66%	46	33.57%	3.3830	.90583
4) Environmental domain	94	66.436%	47	32.34%	3.3218	.71327
Overall satisfaction with QOL	93	65.5%	48	34.5%	3.2779	

In addition, T-test, percentages and frequency were used to assess the mean for each question in each domain of quality of life (as seen in table 5.3). For the physical domain, the highest mean was for the question number one which assessed participants' satisfaction with their ability to perform their daily living activities as 53.9% (n=76) were satisfied and 12.8% (n= 18) were not satisfied (mean=3.49). The lowest mean was for the question number seven which assessed the participants' feeling about the physical pain that prevented them from doing what they need to do as 26.9% (n=38) of them were satisfied and 47.6% (n=66) were not satisfied (mean=2.70).

Table (5.3): The mean, the frequency and the percentages for each question related to the physical domain

Items	Satisfied		Not satisfied		Mean	S.D
	Freq	%	Freq	%		
1) How satisfied are you with your ability to perform your daily living activities?	76	53.9%	18	12.8%	3.49	.961
2) How satisfied are you with your sleep?	71	50.3%	31	22%	3.40	1.089
3) How well are you able to get around?	68	48.2%	36	25.6%	3.34	1.145
4) How satisfied are you with your capacity for work?	64	45.4%	32	22.7%	3.31	1.090
5) Do you have enough energy for everyday life?	62	44%	26	18.4%	3.30	1.055
6) How much do you need any medical treatment to function in your daily life?	61	43.3%	37	26.2%	3.23	1.209
7) To what extent do you feel that physical pain prevents you from doing what you need to do?	38	26.9%	66	47.6%	2.70	1.219

Furthermore, for the psychological domain, findings showed that the highest mean was for the question number one (mean=3.68) which assessed how the participants were able to accept their bodily appearance as 61% (n=86) were satisfied and 12% (n=17) were not satisfied. The lowest mean was for the question number six (mean=3.06) which assessed whether the participants had negative feelings such as blue mood, despair, anxiety, depression as 24.8% (n=35) were satisfied and 28.4% (n=40) were not satisfied as seen in table (5.4).

Table (5.4): The mean, the frequency and the percentages for each question related to the psychological domain

Items	Freq	Satisfied	Freq	Not satisfied	Mean	S.D
1) Are you able to accept your bodily appearance?	86	61%	17	12%	3.68	1.009
2) To what extent do you feel your life to be meaningful?	69	48.9%	28	19.8%	3.37	1.161
3) How satisfied are you with yourself?	63	44.7%	32	22.7%	3.32	1.104
4) How much do you enjoy life?	56	39.7%	27	26.3%	3.18	1.060
5) How well are you able to concentrate?	49	34.8%	35	24.8%	3.13	.940
6) How often do you have negative feelings such as blue mood, despair, anxiety, depression?	35	24.8%	40	28.4%	3.06	.980

For the social domain, the highest mean was for the question number one (mean=3.50) which assessed if the participants were satisfied with their sexual life as 54.6% (n=77) were satisfied and 12.8% (n=18) were not satisfied. The lowest mean was for the question number three (mean=3.33) which assessed if the participants were satisfied with their personal relationships as 48.2% (n=68) were satisfied and %23.4 (n=33) were not satisfied as seen in table (5.5).

Table (5.5): The mean, the frequency and the percentages for each question related to the social domain

Items	Satisfied		Not satisfied		Mean	S.D
	Freq	%	Freq	%		
1) How satisfied are you with your sex life?	77	54.6%	18	12.8%	3.50	1.026
2) How satisfied are you with the support you get from your friends?	74	52.5%	29	20.6%	3.41	1.165
3) How satisfied are you with your personal relationships?	68	48.2%	33	23.4%	3.33	1.100

Finally, for the environmental domain, the highest mean was for the question number one (mean=3.60) which assessed participants' satisfaction with the conditions of their living place as 60.3% (n=85) were satisfied and 17% (n=24) were not satisfied. The lowest mean was for the question number three (mean=2.77) which assessed if the participants were satisfied with their leisure activities and 24.9% (n=35) were satisfied and 39.8% (n=56) were not satisfied as seen in table (5.6).

Table (5.6): The mean, the frequency and the percentages for each question related to the environmental domain

Items	Satisfied		Not satisfied		Mean	S.D
	Freq	%	Freq	%		
1) How satisfied are you with the conditions of your living place?	85	60.3%	24	17%	3.60	1.200
2) How safe do you feel in your daily life?	67	47.5%	21	14.9%	3.42	.904
3) How satisfied are you with your access to health services?	60	42.5%	31	22%	3.28	1.022
4) How available to you is the information that you need in your day-to-day life?	55	39%	29	20.6%	3.23	.966
5) How healthy is your physical environment?	61	43.2%	38	27%	3.21	1.094
6) How satisfied are you with your transport?	55	39%	39	27.6%	3.12	1.131
7) Have you enough money to meet your needs?	41	29.1%	51	36.1%	2.83	1.165
8) To what extent do you have the opportunity for leisure activities?	35	24.9%	56	39.8%	2.77	1.045

5.3.1.3. The Relationship between the four domains of quality of life and other independent variables.

The Relationships between the 4 domains of the dependent variable quality of life and the independent variables such as socio-demographic data (age, sex, place of residency, marital status, educational level and economic statues), depression, and medical history including duration of diabetes, complication of diabetes, psychological problems, and seeking psychotherapy were assessed by using t-test and one way ANOVA test. The statistical significance was defined as a P-value of (0.05) as shown in table (5.7).
For the relationship between QOL and gender, T-test revealed a statistically significant relationship between gender and psychological domain at P-value (.024) and social domain at P-value (.021). Also, it revealed no statistically significant relationship with the physical domain and the environmental domain. For example, for the psychological domain, the males had higher mean (3.3) than females (3.1) and for the social domain, males had a higher mean (3.5) than females (3.2) as shown in table (5.7).

Furthermore, ANOVA test showed a statistically significant relationship between QOL and age group for the physical domain at P-value (.018), the psychological domain at P-value (.014), the social domain at P-value (.007), and the environmental domain at P-value (.004). For example, the age group 21-24 years old had the lowest mean for the physical domain (2.9), the psychological domain (3.0), the social domain (3.0), and the environmental domain (3.0) than the age group 15-18 and 18-21 years old. Also, the age group of 15-18 years old had higher mean for the psychological domain (3.3), the social domain (3.6), and the environmental domain (3.4) than the age group 18-21 and 21-24 years old. For the physical domain, the age group 18-21 years old had higher mean (3.3) than the age group 15-18 or 21-24 years old as shown in table (5.7).

In addition, ANOVA test revealed a statistically significant relationship between QOL and place of residency at P-value (.001) for the physical domain, at P-value (.010) for the psychological domain, at P-value (.003) for the social domain, and at P-value (.010) for the environmental domain. For example, the participants who lived in the city had higher mean for the physical domain (3.4), the psychological domain (3.5), the social domain (3.6), and the environmental domain (3.5) than the participants who lived in the village or camp. Also, the participants who lived in the camp had lower mean for the physical domain (2.9),

the psychological domain (3.0), the social domain (3.0), and the environmental domain (3.0) than the participants who lived in city or village as shown in table (5.7).

Also, ANOVA test revealed a statistically significant relationship between QOL and marital status at P-value (.004) for the physical domain, at P-value (.001) for the psychological domain, at P-value (.004) for the social domain and at P-value (.000) for the environmental domain. For example, the divorced participants had a higher mean for the physical domain (3.3) and the psychological domain (3.3) than the single or married participants. Also, the single participants had higher means for the social domain (3.4), and the environmental domain (3.4) than the married or the divorced participants. Further, the married participants had lower mean for the physical domain (2.6), the psychological domain (2.6), the social domain (2.6), and the environmental domain (2.6) than the single or divorced participants as shown in table (5.7).

Moreover, ANOVA test revealed a statistically significant relationship between educational level and the psychological domain at P-value (.039), and the environmental domain at P-value (.015). However, there were no statistically significant relationships between the educational level and the physical (P-value .058) and the social domains (P-value .311). For example, the participants who had university degree had higher mean for the psychological domain (3.4), the environmental domain (3.5) than the other educational levels. Also, the participants who had primary level had lower mean (mean=2.68) than the other educational levels for the psychological domain (3.0) and for the environmental domain (2.5) as shown in table (5.7).

Regarding the relationship between QOL and the participants who suffered from psychological problems in addition to diabetes mellitus type 1, their T-test revealed a statistically significant relationship with the four domains of QOL at P-value (.000) for each domain as shown in table (5.7).

Finally, for the relationship between QOL and the economic status, the duration of diabetes, the diabetes complications, and if the participants seek psychotherapy to treat their psychological problems, the ANOVA test and T-test revealed no statistically significant relationships between them and the four domains of the QOL as shown in table (5.7).

Table (5.7): The relationship between the four domains of quality of life and other independent variables

variables		Physical domain		Psychological Domain		Social Domain		Environmental Domain	
		Mean	P-value	Mean	P-value	Mean	P-value	Mean	P-value
gender	Male	3.2250		3.3744		3.5525		3.3750	
	female	3.0777	.176	3.1225	.024	3.2010	.021	3.2647	.361
Age group	15- < 18	3.2275		3.3827		3.6296		3.4653	
	18- < 21	3.3077	.018	3.3504	.014	3.4274	.007	3.4615	.004
	21-24	2.9464		3.0278		3.0694		3.0469	
place of residency	Village	3.1738		3.2278		3.4722		3.3646	
	Camp	2.9048		3.0741		3.0296		3.0806	
	City	3.4325	.001	3.5185	.010	3.6759	.003	3.5521	.010
Social status	Single	3.2149		3.3252		3.4743		3.4126	
	Married	2.6607		2.6875		2.6875		2.6484	
	Divorce	3.3571	.004	3.3333	.001	3.3333	.004	3.1250	.000
Educational level	Illiterate	3.4286		3.0000		3.0000		2.8750	
	Primary	2.5476		3.0000		2.6111		2.5625	
	Preliminary	3.0657		3.0800		3.4067		3.2150	
	Secondary	3.1786		3.2542		3.4167		3.3531	.015
	University	3.3084	.058	3.4886	.039	3.4394	.311	3.5284	
Economic status	No income	3.2476		3.2778		3.4444		3.3750	
	< 1000	2.9571		2.8667		3.1000		2.9625	
	1000 < 2000	3.1485		3.2810		3.4641		3.3039	
	2000-3000	3.2857		3.3761		3.4957		3.4904	
	> 3000	3.0089	.330	3.3229	.076	3.1458	.392	3.3672	.113
Duration of illness	< 6 months	2.8214		3.0000		3.1667		2.7500	
	6 months – < one year	2.8901		3.0769		2.8462		2.9615	
	One year – < 3 years	3.1286	.271	3.2333	.617	3.2833	.102	3.3125	.075
	> 3 years	3.2047		3.2885		3.4776		3.3906	
Diabetes complications	Yes	3.0974		3.1439		3.2803		3.2472	
	No	3.1771	.500	3.3038	.188	3.4340	.355	3.3529	.419
Psychological problems	Yes	2.7338		2.9091		2.8864		2.8267	
	No	3.3446	.000	3.4089	.000	3.6082	.000	3.5464	.000
psychotherapy to treat your psychological	Yes	3.2540		3.2901		3.5309		3.4398	
	No	3.1303	.372	3.2442	.748	3.3480	.347	3.2939	.341

5.3.2. Part two: Depression findings related questions

Depression was assessed by using Beck Inventory Scale which includes 21 items. The findings showed that 41.1% (n=58) of the participants had a score indicative for the presence of depression. Also, the scores of depression were classified into 4 categories: Minimal, mild, moderate, and severe. T-test, frequency and percentage were used to assess the levels of depression among the participants. The depression severity data at the baseline revealed that 52.5% (n=74) of the participants had minimal depression symptoms (mean=1.85), 17.7% (n=25) had mild depression symptoms (mean=1.88), 17.7% (n=25) had moderate depression symptoms (mean=1.84), and 12.1% (n=17) had severe depression symptoms (mean=2.71) as seen in table (5.8).

Table (5.8): The percentage and the mean of depression according to its 4 levels:

Valid	Freq	%	mean
Minimal	74	52.5	1.85
Mild	25	17.7	1.88
Moderate	25	17.7	1.84
Severe	17	12.1	2.71
Total	141	100.0	1.96

Furthermore, Pearson's test was used to test the correlation between the total score of depression and quality of life. Pearson's test showed a strong inversed statistically significant relationship between quality of life and depression (Pearson Correlation= -.668) as shown in table (5.9).

Table (5.9): The relationships between QOL and depression (Pearson's correlation):

		Beck Depression Score	QOL Scale
Beck Depression Score	Pearson Correlation	1	-.668-
	Sig. (2-tailed)		.000
	N	141	141
QOL Scale	Pearson Correlation	-.668-	1
	Sig. (2-tailed)	.000	
	N	141	141

Also, Pearson's test was used to test the correlation between depression and four domains of the quality of life. Pearson's test showed a strong inversed statistically significant relationship between quality of life domains and depression. The strongest relationship between QOL and depression was for the psychological domain (Pearson Correlation= -.609), the environmental domain (Pearson Correlation= -.606), and the physical domain (Pearson Correlation= -.600). The weakest relationship was with the social domain (Pearson Correlation= -.599) as shown in table (5.10).

Table (5.10): The relationships between the four domains of QOL and depression (Pearson's correlation):

Domain	Beck depression score
Physical domain	
Pearson Correlation	-.600-
Sig. (2-tailed)	.000
N	141
Psychological domain	
Pearson Correlation	-.609-
Sig. (2-tailed)	.000
N	141
Social domain	
Pearson Correlation	-.599-
Sig. (2-tailed)	.000
N	141
Environmental domain	
Pearson Correlation	-.606-
Sig. (2-tailed)	.000
N	141

Correlation is significant at the 0.01 level (2-tailed).

In addition, for the relationship between depression and other independent variables, ANOVA test and T- test were used to assess their relationships as seen in table (5.11).

For example, regarding the relationship between depression and gender, the results revealed a significant relationship at P-value (.011). The T-test revealed that females (mean=2.13) had more depression than males (mean=1.67) as shown in table (5.11),

Also, findings as shown in table (5.11) revealed a significant relationship between the depression and age group at P-value (.019). ANOVA test revealed that age group 21-24 years old (mean=2.23) had more depression than age group 18-21 years old (mean=1.85), and age group 15-18 years old (mean=1.63).

Moreover, the relationship between depression and place of residency revealed a significant relationship at P-value (.028). ANOVA test revealed that the participants from the camps (mean=2.13) suffered from depression more than the participants from cities (mean=1.50) and villages (mean=1.95) (see table 5.11).

Moreover, the relationship between depression and marital status showed a significant relationship between them at P-value (.017). The ANOVA test revealed that divorced participants (mean=3.00) had more depression than the single participants (mean=1.80) and the married participants (mean=2.50) (see table 5.11).

In addition, the relationship between depression and educational level revealed a significant relationship at P-value (.004). ANOVA test showed that participants with primary education (mean=3.17) had more depression than illiterate (mean=1.00), preliminary (mean=1.82), secondary (mean=2.15) and university education (mean=1.59) (see table 5.11).

For the relationship between depression and diabetes complications, T-test finding as shown in table (5.11) revealed a significant relationship at P-value (.043) and the participants with complications (mean=2.16) had more depression than the participants who did not have any diabetes complications (mean=1.76).

Further, the relationship between depression and the participants who suffered from psychological problems in addition to diabetes mellitus, revealed a significant relationship at P-value (.000) as the participants who had psychological problems had more depression (mean=2.57) than the participants who did not have such as problems (mean=1.59) (see table 5.11).

Finally, ANOVA test and T-test findings revealed no significant relationship between depression and economic status, duration of diabetes and seeking psychotherapy (see table 5.11).

The next chapter discussed the findings of current study.

Table (5.11): The relationship between Beck depression score and other independent variables.

Independent variables		Mean	S.D	P. value
Gender	Male	1.67	1.001	.01
	Female	2.13	1.132	
Age	15 years – less than 18 years	1.63	.853	.019
	18 years – less than 21 years	1.85	1.040	
	21 years – 24 years	2.23	1.276	
Place of residency	Village	1.95	1.096	.028
	Camp	2.13	1.179	
	City	1.50	.845	
Marital status	Single	1.80	1.000	.017
	Married	2.50	1.461	
	Divorce	3.00	1.414	
Educational level	Illiterate	1.00	.	.004
	Primary (1-6 years study)	3.17	.753	
	Preliminary (6 – 9 years study)	1.82	1.024	
	Secondary (10 – 12 years study)	2.15	1.252	
	University	1.59	.871	
Economic status	No income	1.80	1.082	.557
	Less than 1000 NIS	2.25	1.164	
	1000 – less than 2000 NIS	1.84	1.102	
	2000 – 3000 NIS	1.77	.959	
	More than 3000 NIS	2.00	1.265	
	Less than 6 months	2.25	1.258	

Duration of illness	6 months – less than one year	2.38	1.325	.322
	One year – less than 3 years	1.85	.988	
	More than 3 years	1.83	1.065	
diabetes complications	Yes	2.16	1.119	.043
	No	1.76	1.054	
Are you suffering from psychological problems beside diabetes mellitus	Yes	2.57	1.228	.000
	No	1.59	.863	
Did you go to the psychotherapy to treat your psychological problems in the past	Yes	2.04	1.192	.448
	No	1.86	1.063	

5.4. Summary:

- The current study showed in general that QOL for diabetic patients was not high for most of the questions in QOL questionnaires. The overall of quality of life for youth with diabetes mellitus were 65.5% (mean= 3.275).

- The findings showed that 67.66% (n=95) of the participants were highly satisfied with the social domain more than other domains. Also, 66.43% (n=94) of the participants were satisfied with the environmental domain, 65.06% (n=92) were satisfied with the psychological domain, and 63.08% (n=89) were satisfied with the physical domain.

- The study found statistically significant relationships between quality of life and gender, age group, place of residency, marital status, educational level and psychological problems.

- The study did not find statistically significant relationships between quality of life and economic status, duration of illness, diabetes complications and seeking psychotherapy.

- The study findings revealed a high level of depression (41.1%) and severe depression. The study showed that 52.5% of the participants had minimal depressive symptoms, 17.7%had mild to moderate depressive symptoms, and 12.1% had severe depressive symptoms.

- The findings revealed statistically significant relationships between depression and gender, age group, place of residency, marital status, educational level, diabetes complications and psychological problems.

- The findings did not find statistically significant relationships between depression and duration of illness and seeking psychotherapy.

Chapter Six

Discussion

Chapter six

6.1. Introduction

This chapter discusses the major findings of the current study and the interpretation of its findings in relation to previously conducted studies found in literature review. The participants' characteristics and their responses to the questionnaire items are discussed. Also, the relationship between dependent and independent variables are highlighted by using many statistical analyses tests such as ANOVA test, and T-test. The results of these statistical tests are discussed in each of the following sections:

- Section one: The characteristics of the participants and medical history.
- Section two: Quality of life and depression.
- Section three: The relationship between dependent and independent variables.
- Section four: limitations and recommendations.

6.2. Section one: The characteristics of the participants and medical history.

In the current study, 51.8% of the participants were males, and 48.2% were females. These findings may in consistency with the Palestinian Ministry of Health (2013) statistics which showed that there were 49 (52.1%) males and 45 (47.9%) females suffering from juvenile diabetes mellitus and the incidence rate (per 100,000) was higher for males (16.0) than females (15.3) (Palestinian Ministry of Health. 2013).

As the study targeted age group ranged from 15 to 24 years old, the findings showed that more than one third of the participants (38.3%) aged from 15 to less than 18 years old, 34.0% were from 21 years old to 24 years old and 27.7% were from 18 years old to less than 21 years old. For place of residence, most of the participants (42.6%) lived in villages

which may reflect the UNRWA Registration Statistical findings (2014) which showed that there were 932.121 refugee people lived in the West Bank, of which 225.672 (25%) lived inside the camps and the majority, 706.449 (75%) lived in the villages and cities.

Furthermore, the vast majority of the participants (87.2%) were single and this result is expected because the average age for marriage in Palestine is 25.2 for males and 20.2 for females (PCBS, 2010). As well, more than one third of the participants (35.5%) had elementary education, 31.2% had (BA) degree, 28.4% had secondary education and only 0.7% of the participants were illiterate. According to Palestinian Central Bureau of Statistics (2014), the illiteracy rate among individuals in Palestine is considered low and amounting to 3.7%.

Also, most of the participants were from low socioeconomic class as 36.2% of them reported coming from families earning 1000 NIS to less than 2000 NIS, 14.2% earned less than 1000 NIS, whereas 10.6% were without income at all. These findings may indicate that 61% of the participants were under the Palestinian poverty line, which is defined by the Palestinian Center Bureau of Statistics (PCBS) as a monthly income of less than 2375 NIS (PCBS, 2010). Further, all the participants did not work as most of were student in school or university. These results are also supported by the Palestinian Bureau of Statistics, which showed that the unemployment rate in Palestine reached 33.3% for aged 15 years and older (PCBS, 2010).

As younger people are more likely to be diagnosed with type 1 diabetes at the age between 11 and 14 years old (Kivi and Boskey, 2014), most of the participants in the current study (73.8%) had diabetes mellitus type 1 for more than 3 years. In addition, the majority of the participants (68.1%) did not suffer from any diabetes complications, and 31.2% of them had such complications such as eye complication; retinopathy (31.8%) which had the highest percentage. These results were supported by UNRWA (2002) study, which found that the percentages of refugees with complications of diabetes type 1 is very high (80%) in comparison with non-refugees (29%) and 32% of the refugees reported having more than one complication and only 20% did not have any complication. The most common complication reported in UNRWA study was retinopathy (20%).

In addition, another study conducted by the National Diabetes Statistics (2014) in Australia which found that 4.2 million (28.5%) people had diabetic retinopathy. Also, Zimmerman (2010) indicated that 13% of the patients with type 1 diabetes mellitus (T1DM) had retinopathy at 5 years and 90% had retinopathy after 10 to 15 years. Twenty-five percent of type 1 diabetics developed proliferative retinopathy after 15 years of diabetes. Finally, Al-Shehri (2014) showed that complications of diabetes were very common mainly retinopathy (42.5%) or neuropathy (28.3%).

Furthermore, in the current study, one third of the participants (31.2%) reported suffering from psychological problems such as tensions and nervousness (43.1%). Interestingly, none of them mentioned depression and they reported other psychological problems which may indicate depression symptoms such as isolation, family problems, fears, neglect, self-loneliness, pessimism, frustration, aggressiveness and weakness in education, sleeplessness, anxiety and fears of amputation. These results were supported by Fritsch and Olshan. (2011) which showed that patients with diabetes mellitus type 1 may suffer from psychological problems including anxiety, sadness, withdrawal, and increased dependency, and approximately 30% of children with new-onset T1DM have a clinically significant adjustment disorder. Another study conducted by Wherrett et al. (2013) found that children and adolescents with diabetes had significant risks for psychological problems including depression, anxiety, eating disorders and externalizing disorders. In addition, Marini et al. (2013) found that individuals with DM I may exhibit significant psychiatric problems including depression, anxiety, adjustment disorders, negative thoughts about themselves, and behavioral problems including anger, oppositional and agitation, feeling distressed and indifferent.

Finally, 80.9% of the participants reported that they did not seek psychotherapy to treat their psychological problems, and only 19.1% of the responders tried psychotherapy. The main two reasons for not seeking psychotherapy as reported by the participants were they did not need psychological services (33.3%) and that they afraid from social stigma (27.1%). Wolf and Liu (2014) stated that 76% of people with type 1 patients reported experiencing more stigma than people with type 2 (52%). In addition, parents of children with type 1 diabetes reported stigmas as the most common cause for not seeking treatment. Another study conducted by Abdoli et al. (2013) showed that a person with type 1 diabetes suffers from social self-stigma and the participants with diabetes realized all aspects of

social stigma including miserable human, candidates of rejected marriage, and deprivation of a normal life.

6.3. Section two: Quality of life and depression.

For quality of life, the findings revealed low quality of life in general and it showed a discrepancy between how the participants rated their quality of life and the findings of statistical analysis. For example, the statistical analysis revealed that the overall of QOL for youth with diabetes mellitus was 65.5%. On other hand, 47.5% (n=67) of the participants rated their quality of life as good and very good and when the questions of quality of life scales were assessed in more depth to find out which questions got 60% of the participants satisfaction, results revealed only two questions related to bodily appearance and the condition of their living place. These results were supported by Australian Institute of Health and Welfare (2002) which showed that people with diabetes are less likely to rate their health as excellent, very good or good compared with people without diabetes and 65.7% of the males with diabetes rated their health as excellent, very good or good, compared with 85.9% of males without diabetes. Further, 68.4% of the females with diabetes rated their health as excellent, very good or good compared with 87.0% of the females without diabetes. Furthermore, Eljedi et al (2006) found that diabetes affected negatively all of the domains of the WHOQOL-BREF. Aziz et al. (2012) found that QOL among Syrian refugees in Kurdistan was lower than general population norms. Another study conducted by Ausili et al. (2007) showed that quality of life in diabetic children was worse than in the healthy sample.

In addition to quality of life, depressive symptoms were assessed in the current study and the cutoff score for diabetic population with a depression was ≥ 16 (Lusman et al. 1997). The findings showed a high level of depression (41.1%, n=58). This result is expected because there is a high correlation between diabetes and depression (Gupta (2014). De Ornelas Maia et al (2013) reported a higher percentage of depression than the current study as 67.3% of type 1 diabetic patients had depression. Also, Goldney et al. (2004) in South Australia revealed that the prevalence of depression in the diabetic population was 24% compared with 17% in the non diabetic population. Palizgir et al. (2013) found a higher level of depression than the previous studies as most of the patients with diabetes in their study suffered from depression (70.7%) and 29.3% had no depression. On other hand,

Whittemore et al. (2002) in USA reported lower percentage of depression than the current study as fifteen per cent of adolescents demonstrated depressive symptoms. Also, Hood (2006) found that 15.2% of the samples were scored at or above the clinical cutoff youth with elevated depressive symptoms and nearly one in seven youth with diabetes met the clinical cutoff for depression. He concluded that this level of depressive symptoms in children and adolescents with type 1 diabetes is nearly double that of the highest estimate of depression in youth in general.

The reasons for this high level of depressive symptoms in the current study might be because diabetes creates problems in that people worry about how they're going to talk about their disease to other people, how diabetes will affect how long they live; they worry about complications, whether or not they'll go blind, and if they'll need a limb amputated. Also, it has a big effect on interpersonal relationships so they tend to withdraw from others and isolate themselves (Gupta, 2014). Further, Ashraff et al (2013) stated that type 1 diabetes mellitus is known to have a major psychological impact on adolescents because of the need to manage a complex medical condition that requires daily completion of multiple self-care behaviors, in addition to the impact of diabetes on social interactions with family members, peers, and teachers, as well as the interference of symptoms such as hypoglycemia with daily activities.

Furthermore, depression was assessed according to its 4 levels (minimal, mild, moderate and severe) and the findings showed that the majority of the participants were screened to have minimal depressive symptoms (52.5%, n=74), 17.7% (n=25) had mild depressive symptoms and 17.7% had moderate depressive symptoms, and 12.1% (n=17) had severe depressive symptoms. Other studies found less severe depression level than the current study. For example, a cross sectional study conducted by Aziz et al. (2012) showed that 16% of patients with diabetes type 1 had moderate depression, (14%) had mild, and (8%) had severe depression. Also, Lawrence et al. (2006) indicated that 14% had mild and 8.6% had moderate or severe depressed mood. Also, Mathew et al. (2012) found that 38.8% (n=31) of the participants had depressive symptoms, among them 25% (n=20) had mild depression, 12.5% (n=10) had moderate depression, and only 1.3% (n=1) had severe depression.

As mentioned previously, adolescence may have depression because of their anxiety about their condition, fear of needles and multiple injections, a feeling of being overwhelmed by injecting and other tasks that needs to be performed daily, frustration over fluctuating blood glucose levels, feeling different, fear of experiencing hypoglycemia in public, embarrassment about their diabetes and their friend's possible negative reactions and difficulty coping with the emotional reaction of family members. In addition, the current study findings showed that stigma had an important impact on their treatment, which might increase their depression, particularly that these participants were young. Qualitative study is required to investigate the causes of high percentages of indications depression and severe depression among Palestinian youth with juvenile diabetes mellitus. For example, Jaser (2010), showed the role of parental attitude such as over-controlling parents may cause the patients with type1 DM to withdraw, become depressed or oppositional.

As depression co-morbidity with diabetes could be perceived as double tragedy by the patients and could result in poor diabetes drug compliance and poor diabetes control with attendant physical complications (Issa and Baiyewu. 2006), the current study examined the relationship between depression and quality of life. As expected Pearson's test found a negative correlation between depression and quality of life (-.668-). Depressive disorders or symptoms could make a patient report a lower quality of life due to poor self-esteem. (Issa et al. 2007, Anaforoglu et al. 2010) In addition, Hadi et al. (2013) showed that quality of life of diabetic patients' type 1 decreases with presence of mental problems such as depression because lower quality of life seems negative family environment especially diabetes conflicts and youths' perceptions that diabetes is upsetting, difficult to manage, and stressful, as well as fear of hypoglycemia.(Delamater et al, 2014). Andreoulakis et al. (2012) concluded that depression had a significant negative impact on QOL of patients with DM, and despite the negative association of depression with overall QOL; depression was not consistently associated with every specific domain of QOL.

In addition, participants' satisfaction with the 4 domains of quality of life was assessed in the current study. For example, more than half of the participants were satisfied with the four domains of quality of life and their answers got more than 60% agreement particularly for the social domain (67.66%, n=95) and the least satisfaction was for the physical domain (63.08%, n=89). These results were supported by UNRWA study (2002) which found that the best QOL domain for the diabetic refugees was the social, but the worst

QOL domain was the environmental. A study conducted in Gaza strip by Eljedi et al. (2006) found that QOL was significantly lower for diabetic patients in all of the domains with the largest differences in the physical health and psychological domains (39 and 35 points difference) and smaller differences in social relationships and environment domains (19 and 13 points difference).This study did not support the current study results which found that the environment domain had the highest mean score than other domains, and the social relationship domain had the worst impact on the diabetic patients. Also, a study conducted by Odili et al. (2008), found that the social relationship domain had the lowest mean score in QOL and the environment domain had the highest mean.

The highest satisfaction with social domain in the current study might be because patients in Arab society have a support from their family or friends or community; which shows a higher prevalence of adherence to treatment (Farias et al. 2013). Family relationships play an important role in diabetes management as greater levels of social support particularly diabetes-related support from spouses and other family members are associated with better regimen adherence, and it serves to buffer the adverse effect of stress on diabetes management (Delamater. 2006). Also, social support can benefit patient's health by buffering stress, changing affective states, increasing self-efficacy, and influencing change in negative health behaviors. Rosland et al. (2008) found that practical and emotional support received by both family and friends had a positive influence on global measures of disease management in patients with diabetes. Additionally, Pereira et al. (2008) indicated strong associations between positive family dimensions (eg, cohesion and familial guidance) and better glycemic control among diabetic patients (Heidarzade 2005).

Environmental domain was the second in rank in this study which is related to good adhesion because the satisfaction of diabetics with home environment, physical security, social and health care, and physical environment positively contributed to less forgetfulness in the use of drugs and stimulate patient autonomy with regard to treatment compliance of diabetic patients (Farias et al. 2013). Furthermore, the psychological domain was the third in rank (65.06%) which included cognitive areas such as enjoying life, feelings of life to be meaningful, ability to concentrate, satisfaction with self, and negative feelings such as blue mood, despair, etc. Dissatisfaction with psychological domain is related to depression as a clinical entity and it is usually associated with negative cognition and negative self-perception (Ibrahim et al .2013). In the current study, findings showed

that the participants had a high level of depression and severe depression as discussed previously and this might affect their psychological well being and their satisfaction.

The physical domains had the lowest satisfaction (63%) in the current study which might be because in chronic diseases such as diabetes, treatment requires behavioral changes in relation to diet, drug intake and lifestyle. Such changes may compromise the quality of life if there is no adequate guidance in connection with the treatment or no recognition on the importance of complications that arise from this disease (Farias et al. 2013).

Consequently, as diabetes mellitus is a demanding disease that affects a person's health-related quality of life, a person's ability to function and to desire satisfaction from doing so and they are constantly reminded of the disease on a daily basis: they have to eat carefully, exercise, and test their blood glucose (Gavrić and Vujmilović, 2014), the participants' satisfaction with quality of life domains was tested in more depth in the current study to check how many questions would get 60% or more of the participants' responses. The findings revealed only two questions related to their body appearance and the conditions of their living place. Other 22 questions showed low participants' satisfaction related to preventing physical pain, the need for medical treatment, enjoying life, having meaningful life, concentration, daily life safety, healthy physical environment, energy, money, availability of information, leisure activities, getting around, work capacity, self-satisfaction, personal relationships, social support, health services access, transportation, having negative feelings and sexual satisfaction.

For example, 50.3% of the participants were satisfied and very satisfied with their sleep pattern. Joslin Diabetes Center (2015) showed that sleep difficulties are more common in people who have diabetes than in people who do not. That is because having diabetes raises the risk sleep problems such as sleep apnea and restless legs syndrome. Also, Esther (2014) showed that a single night of partial sleep deprivation decreased insulin sensitivity by 14-20% in patients with type 1 diabetes .

Regarding pain, 47.6% of the participants answered that physical pain little or not at all prevented them from doing what they need to do. Spero (2009) stated that pain affects millions of people with diabetes. For most of these people, the pain is chronic and defined as pain persisting for more than six months, experienced almost every day, and of

moderate to severe intensity, or that significantly interferes with daily activities. In some cases, a person's pain is clearly related to complications of diabetes; in other cases, it is not. People with diabetes report rates of chronic pain anywhere from 20% to over 60% much higher than rates in the general population. Pain has been shown to interfere with self-management activities, sleep, physical functioning, work, family relationships, mood and quality of life (Spero. 2009) .

In addition, money is another important element of quality of life and the participants were not satisfied because of the monetary cost of diabetes impacts on people who have diabetes, their friends and family, nongovernment organizations and the government. A person with diabetes may have to pay out-of-pocket costs for medications, pathology tests, supplies and equipment. Also, the participants complained from low energy and Fleckenstein (2008) stated that the low energy of diabetics affects their physical as well as their mental abilities. Exhausted as they are, diabetics scramble to make it through their daily activities.

Moreover, further assessment was done to assess participants' highest and lowest satisfaction mean for all questions in each domain of quality of life. For example, the findings showed that the highest mean for the questions related to the physical domain was for the ability of performing daily living activities (mean=3.49). This result was supported by a study conducted by Dudzińska et al. (2008) which showed that one third of the patients reported that diabetes interfered with their daily activities and approximately half of the patients declared that diabetes did not interfere with their performance of daily tasks. Also, more than 60% of the patients reported that diabetes did not interfere with their family lives. The lowest mean in the physical domain was for the question how physical pain prevented them from doing things (mean=2.70). Galer et al. (2000) stated that pain in patients with diabetes mellitus type 1 caused substantial interference in sleep and enjoyment of life and moderate interference in recreational activities, normal work, mobility, general activity, social activities and mood.

Also, for the questions related to psychological domain, the highest mean was for how much the diabetes mellitus type 1 patients accept their bodily appearance (mean=3.68). According to National Association of Social Workers (2001), adolescence marks a time of rapid and intense emotional and physical changes. There is an increased value placed on

peer acceptance and approval, and a heightened attention to external influences and social messages about cultural norms. Body image and related self-concept emerge as significant factors associated with health and well-being during this developmental phase, as youths begin to focus more on their physical appearance. On other hand, Troncone et al. (2014) found that children with type 1 diabetes and controls showed underestimation and dissatisfaction with body size and patients, especially girls, were more accurate in their perception of body size. In addition, Bays et al. (2009) showed that individuals with diabetes mellitus might differ in their perception of body image compared with those without diabetes mellitus. The lowest mean in the psychological domain was for the question "if they feel negative feelings such as blue mood, despair, anxiety and depression" (mean=3.06). These results were supported by Banwari (2013) who found that diabetes mellitus type 1 is associated with an increased risk and prevalence of depression. Another study conducted in Turkey by Atasoy et al (2012) indicated that diabetic patients type 1 are more likely to have depression and to have deterioration of QOL. Further, Yi Tsao et al. (2010) found that depression is the major negative impact on the quality of life (QOL) and decrease physical activity and mobility.

Further, for the questions related to the social domain, the highest mean was for sexual life (mean=3.50) and this result was supported by Schreiner Engel et al. (1987) who found that type I diabetes have a little or no effect or negative impact on sexual desire, orgasmic capacity, lubrication, sexual satisfaction, sexual activity, and on the relationship with the sexual partner. On other hand, Sanders Polin (2012) stated that diabetes could affect sexual function and cause anxiety, which can result in sexual dysfunction. McCoy (2009) indicated that having type 1 diabetes could increase the risk of sexual dysfunction for both men and women. In men, the nerve damage and problems with circulation that are common complications of type 1 diabetes can lead to problems with erection or ejaculation and it is directly reflective of hyperglycemia and poor blood sugar control.

The lowest mean in the social domain was for personal relationships (mean=3.33). Pendley et al. (2001) stated that both diabetic children and adolescents receive instrumental and self-esteem support from friends and childhood and adolescent friendships share the common feature of mutual liking. In addition, Peterson (2015) found that diabetes does not just affect lifestyle, but can have an impact on emotions, relationships, work and hobbies. As mood, changes and depressive illnesses are more common in people who have a long-

term medical condition than in people who are well, diabetes affects self-esteem and patients' roles at home and long-standing diabetes can affect the physical side of a relationship and their quality of life.

In addition, for the questions related to the environmental domain, the highest mean was for the living place (mean=3.60) and the lowest mean was for opportunity for leisure activities (mean=2.77). Wadén et al. (2005) found that low levels of leisure time physical activity were associated with poor glycemic control in type 1 diabetic. People with diabetes were less likely to report exercising regularly than people without this disease, and less engage in jogging, aerobics, dancing, calisthenics, bicycling, weight lifting, several ball sports, and skiing than people without diabetes (Ford and Herman, 1995).

Finally, further assessment was done to assess the relationship between depression and 4 domains of quality of life. On contrary to the previous results, the psychological domains had the strongest relationship with depression while social domain had the weakest relationship.

In the current study, the participants were most satisfied with the social domain than other domains particularly their social support from their families, spouses and friends which may affect positively their adherence to treatment and decrease depression (Farias et al. 2013). Social support can benefit patient's health by buffering stress, changing affective states, increasing self-efficacy, and influencing change in negative health behaviors (Delamater. 2006).

The reason that the psychological domain had the strongest relationship with depression might be because depression is usually associated with negative cognition and negative self-perception and this may affect the depressed diabetic patients (Ibrahim et al. 2013).

6.4. Section three: The relationship between dependent and independent variables.

This section discussed the relationship between the quality of life, depression and other independent variables including socio-demographic data and medical history for patients with diabetes mellitus type 1.

6.4.1. The relationship between quality of life, depression and gender

The current study assessed the relationship between quality of life, depression and gender. Findings showed a statistically significant relationship between gender and psychological and social domains of quality of life. For example, the results showed that the QOL for females was lower than males. These results were supported by Eljedi study (2005), which found that females had a lower QOL than males. Other studies conducted by Graue (2003), Novato and Grossi (2011), Naughton et al. (2008), Papadopoulos et al. (2007), Kalyva et al. (2011), Graue et al. (2007), Faulkner (2003), Eljedi et al. (2006) also found that QOL was low for girls and high for boys.

In addition, the findings revealed a statistically significant relationship between depression and gender. Findings showed that females had higher depression levels than males. The results were supported by Aziz et al. study (2012), which found that females had more depression (52%) than males (48%). Also, another study conducted by Lawrence et al. (2008) showed that females had a higher depression than males. Other studies which were conducted by Pinquart and Shen (2010), Katharine and Maartje (2014), Zhao et al. (2006), Nasser et al. (2009), Egede et al. (2002), Nichols et al. (2007), Palizgir, Bakhtiari and Esteghamati (2013), Al-Amer et al. (2001), Anderson et al. (2001), Lena Undén et al. (2008), revealed that females were more likely to develop depression than males.

These results might be due to the fact that males have the opportunity to go out visit friends, work and earn money. In addition, males spend too much time outside the house (which is in most times is the source of tension and anxiety) and this improves their quality of life. On the contrary, females stay most of their time at home taking care of the children, looking after every single detail of their houses which represents a source of tiredness and worry, and this affects negatively their quality of life. Klocek and Kawecka (2003)

confirmed the aforementioned results as that in most societies, no matter where they are in Europe, Africa, Asia, or America, males dominate the family as well as the society (Aljeesh and Elayyan. 2005).

6.4.2. The relationship between quality of life, depression and age group

Findings revealed a statistically significant relationship between the four domains of QOL and age group. The results showed that the QOL was low for the age group 21-24 years old (mean=3.0226), and was high for the age group 15-18 years old (mean=3.426). These findings were supported by Eljedi study (2005) which found that older age was associated with a lower QOL. Also, Glasgow et al. (1997), Novato and Grossi (2011), Wagner et al. (2005) Naughton et al. (2008), Graue et al. (2007), Ausili et al. (2007), Abolfotouh et al. (2011), Eljedi et al. (2006) found that diabetes patients who are young had better QOL than the patients who are old.

Further, the current study findings revealed that age was a crucial factor that impacted depression. The results showed that participants from age group 21-24 years old (34.0%, n=48) had higher level of depression (mean=2.23) than younger age group (15-18 years old, mean=1.63 and age group 18-21 years old, mean=1.85).

These findings can be explained by the fact that when patient gets diabetes in old ages such as early forties, he can resist the disease and his response to the medication will be positive with no or at least very mild side effects, therefore, he can enjoy a good quality of life in comparison with young ages. On the other hand, when he gets older, he will be weak with low resistant and more complications as well as more side effects which will lead to deterioration of his quality of life (Aljeesh and Elayyan. 2005). Moreover, Erickson et al (2001) agreed with the current study results and Delamater et al. (2014) showed that daily stressors faced by younger patients are usually related to friends/ peers and siblings, and their coping behaviors including choosing an alternate activity and taking personal responsibility.

6.4.3. The relationship between quality of life, depression and place of residence

Furthermore, the study found a statistically significant relationship between the four domains of QOL and place of residence and the quality of life for the participants from the camps was the worse (mean=3.022) than the participants from the villages (mean=3.208) or the cities (mean=3.5447). The result were supported by Eljedi study (2005) which found that refugees lived in the camps with diabetes had significantly poorer QOL than non-refugees diabetic in physical, psychological, social and environmental domains.

In addition, the current study found a relationships between depression and place of residence especially for the participants who lived in camps (mean=2.13) than the participants who lived in cities or villages. The possible interpretation for these results is that the crowdedness, as well as the lack of enough supplies and facilities affect the physical (e.g., more at risk diseases), psychological (e.g., stress, fears and hopelessness), social (e.g., refugee status and roles), economic hardship, and mental health of the refugees. It is hypothesized that the impact of the camp environment on the QOL of the diabetic refugees is more intensified and worse than it would be on other individuals. The mental health and functioning are affected by the refugee environment and its consequences (UNRWA. 2002).

6.4.3. The relationship between quality of life, depression and marital status

Regarding to the marital status, findings revealed a statistically significant relationship between the four domains of QOL and marital status. The study showed that the highest QOL was for single participants (mean=3.356) and the lowest QOL was for married participants (mean=2.287). The results were supported by Al-Shehri study (2014) which showed that married patients had significantly worse QOL compared with non-married patients. Also, Eljedi et al. (2006) found that being married had a small positive effect on QOL. This finding may be explained by the fact that married diabetic people have more responsibilities and more persons to look after, in addition to their disease compared with

those diabetics who are not married. So married participants had more life responsibilities toward spouse, children and home needs (Al-Shehri. 2014).

Furthermore, the marital status affected depression and the current study showed that divorced participants (mean= 3.00) had higher level of depression than married (mean=2.50) or single participants (mean=1.80). The results were supported by Egede et al. study (2002) which found that married individuals with diabetes were more likely to have depression than unmarried individuals with diabetes. Another study conducted by Kovacs et al. (1985) found that people with marital distress had depression more than people with a good marital relationship. Divorced participants had more depression might be because of the lack of emotional intimacy and support and the changes in their lifestyle after marriage or divorce **(**Hadi et al. 2012**).**

6.4.4. The relationship between quality of life, depression and educational level

Moreover, the study indicated a statistically significant relationship between the psychological and the environmental domains and educational level. Low QOL was for the participants who had primary level of education in psychological domain (mean=3.0000) and environmental domain (mean=2.5625). High QOL was for the participants who had university level of education in psychological domain (mean=3.4886) and environmental domain (mean=3.5284). The results were supported by Issa and Baiyewn (2006) who found that poor quality of life was associated with lower educational status, and respondents in elementary occupations (such as trading) were more likely to have a poor score for QOL. Furthermore, Nilsson et al **(**1999) found an association between poor QOL and lower educational level. Furthermore, in Iran, a study conducted by Ghahramani and Montazeri (2013) found that higher educational level had impact on better QOL and probably better employment and financial status of patient affect treatment seeking.

Depression is also affected by educational level. The current study showed that the participants who had primary level (1-6 years) (mean= 3.17) had more depression than participants who had university level (mean=1.59). The result were supported by Zhao et

al. study (2006) which found that participants with low educational level had a higher prevalence of both diabetes and depression than those with high educational level. Also, another study conducted by Palizgir et al. (2013) showed that patients with lower levels of education had more depression than the patients with high level of education. Further, in Jordan, Al-Amer et al. (2001) found that low-educated people are more likely to develop depression than educated people and Carnethon et al. (2003) stated that participants with less than a higher school education had depression more than participants with high education level.

These findings can be explained by the fact that low schooling produces negative results in health care; because of the instructions complexity and information that patients need to obtain. Low education level can also complicate the learning process because as the therapeutic complexity increases, the patients require more complex cognitive abilities so as to keep their metabolic control. So, diabetics with low capability of understanding on health issues present greater complications and little control of blood glucose levels, and have little knowledge about their disease (Farias et al. 2013). Also, Qanbari. (2002) stated that educations for diabetes patients cause feeling of happiness and more convince among them. In addition, Byrne et al. (2012) suggested that those who have lower educational attainment may not gain as much from participating in a self-management program and such programs are targeted at more educated patients.

6.4.5. The relationship between quality of life, depression and economic status

Also, the findings showed no statistically significant relationship between the QOL and economic status. The findings revealed that quality of life was better for participants with family income of 2000 - 3000 NIS and was worse for participants with less than 1000 NIS monthly. On the other hand, Novato and Grossi (2011) found that individuals from better socioeconomic classes showed a better QOL. In addition, other studies by Hassan et al. (2006) and Kiadaliri et al. (2013) found that better socioeconomic status were associated with better QOL among the patients with diabetes mellitus type 1. Also, Eljedi et al. (2006) found that lower income (below 200 $) had stronger effect on QOL among patients.

For depression, the findings of the current study found no statistically significant relationship between depression and the economic status which was not supported by other studies. For example, Nichols et al. (2007) found that lower incomes had more depression than higher income. Also, Carnethon et al. (2003) found that participants with low socioeconomic status had more depression than participants with high socioeconomic status. In addition, Kovacs et al. (1985) found that diabetic patient's parents from low socio-economic status had depression more than patients who live with parents with high socioeconomic status. The monthly income affects the individual behavior in terms of health, quality of treatment, social support, community resources and in the knowledge related to the disease, as well as in physical activities development, diet and treatment choices (Farias et al. 2013).

6.4.6. The relationship between quality of life, depression and duration of illness

Regarding to the relationship between QOL and duration of illness, the results found no statistically significant relationship. These results were supported by Hassan et al. study (2006) which found that longer duration of illness was not associated with poorer glycemic control. Also, Laffel et al. (2003) found that the group with longer duration (>2 years; n=62) compared with the group with the shorter (≤ 2 years; n= 38) had similar quality of life scores. Another study conducted by Hart et al. (2003) to investigate the health-related quality of life of patients with newly diagnosed type 1 diabetes in the first year after diagnosis and to compare their health-related quality of life, 1 year after diagnosis, with people of comparable age from the general population revealed that although health-related quality of life is initially decreased when the diagnosis of type 1 diabetes is made after 1 year, health-related quality of life was comparable with that of subjects in the general population. In addition, other studies conducted by Issa and Baiyewn (2006), Gåfvels et al. (2009), Mari Aalto, Uutela and Aro (1997), Hassan et al. (2006), Anaforoglu et al. (2010), found no relationship between duration of illness of diabetic mellitus type 1 and QOL.

Delamater et al. (2014) indicated that patients after the diagnosis of their illness, they suffered from psychological shock, and they are not able to accept or adapt to the new situation (as if they enter the denial stage); and this is why their QOL values decreased in

the first year of diagnosis. But after 2-5 years, they started to psychologically accept their disease and manage it correctly (as if they move in bargaining stage). As a result, their QOL means improved. Finally, when diabetes extends to more than 10 years and the patients started to develop complications and/or comorbidities, their QOL domains significantly decreased.

Further, the findings revealed a statistically significant relationship between depression and duration of illness. The findings showed that newly diagnosed patients with diabetes for less than 6 months had more depression than the patients for more than 3 years. The result were supported by Brown et al. study (2005) which found that individuals with newly diagnosed diabetes were more likely to have a previous history of depression 30% compared with people without diabetes. Buschaed et al. (1980) found significantly depression in newly diagnosed diabetics and the duration of illness (2-8 months) had more depression than the duration of illness between (5-8 years). Delamater et al. (2014) indicated that children with type1 diabetes are at risk for adjustment problems during the initial period of adaptation after diagnosis and when adjustment problems exist, children are at higher risk for continued adjustment difficulties and depression. Also, Kakleas et al. (2009) stated that in the initial period after diabetes diagnosis, children show difficulties in coping with the disease often presenting with feelings of sadness, withdrawal and anxiety and 30% develop clinical adjustment disorder in the 3 month period following diagnosis. Such difficulties often resolve within the first year, but poor adaptation at this initial phase places children at risk for later psychological difficulties such as depression.

6.4.7. The relationship between quality of life, depression and diabetes complications

Regarding to the relationship between QOL and diabetes complications, results revealed no statistically significant relationship between them. However, other studies found statistically significant relationships between them. For example, Lloyd et al. (1992) found that patients with macro vascular disease ($P < 0.01$) or nephropathy ($P < 0.05$) reported significantly poorer quality of life compared with those who were free from all complications and found that quality of life significantly deteriorated according to the presence of multiple (≥ 4) complications ($P < 0.001$). Also, Hart et al. (2003) found that hyperglycemic complaints and macro vascular complications had a profound negative

influence on QOL. Furthermore, other studies conducted by Naughton et al. (2008), Larsson, Lager and Nilsson **(**1999), Jacobson et al. (2013), Hahl et al. (2002) found that decreases in QOL are particularly likely among patients with a higher prevalence of severe complications and worse QOL was associated with diabetes complications.

Moreover, the current study showed a statistically significant relationship between diabetes complications and depression. The result were supported by Clouse et al. study (2000) which found that depression was significantly associated with hyperglycemia ($Z = 5.4$, $P < 0.0001$). Nichols et al. (2007) stated that patients with diabetes complications had more depression than patients with less diabetes complications. Higher depression symptom scores were also related to the presence of ≥4 complications ($P< 0.001$). These findings were supported by Lloyd et al. (1992) who found that higher depression symptom scores were related to the presence of ≥4 complications ($P< 0.001$) and poorer quality of life and symptoms of depression may both result from complications.

6.4.8. The relationship between quality of life, depression and psychological problems

Finally, the current study revealed a statistically significant relationship between QOL and psychological problems. The results were supported by Northam et al. (2005) who found that adolescents with type 1 diabetes are at high risk for psychological problems and psychiatric disorder. Poorly controlled diabetes over the first 10 years of illness was associated with pre-existing behaviour problems at diagnosis and there was a trend for an association with current psychiatric status. Bryden et al. (2003) found that psychological problems and psychiatric disorders increased from 16 to 28% (20% in men, 36% in women) with patients who suffered from diabetes mellitus type 1.

Also, the current study found a statistically significant relationship between depression and psychological problems. This result was supported by Delamater et al. (2014) who found that about 15% of youth with diabetes reported elevated levels of psychological distress with potential negative consequences for self-care, and behavioral problems are associated with poor glycemic control. Also, Dudzińska et al. (2008) showed that diabetes can lead to frustration and to a feeling of otherness and solitude. Such changes very frequently result in temporary or chronic depression.

6.6. Conclusion

The current study assessed depression and quality of life of youth with Juvenile diabetes (T1D.M) aged 15-24 years who attended UNRWA clinics in the West Bank. The findings indicated that type 1 DM negatively affected QOL, and the participants did not have a high quality of life. For example, the current study showed that the overall of QOL for diabetic patients was (65.5%) and 47.5% (n=67) of the participants rated their quality of life as good and very good. In addition, most of the QOL questions (22 out of 24 questions) got less than 60% of the participants' satisfaction. Also, the participants were satisfied with the social domain then environnemental domain, psychological domain and they were least satisfied with the physical domain.

Further, the study findings showed that 41.1% of the participants had Beck Depression Inventory scores indicating depression and 12.1% of them had severe depressive symptoms. This is considered high in comparison with other studies in literature review which may indicate the need for further interventions by mental health professionals and policy makers.

Furthermore, Pearson's test showed a strong inversed statistically significant relationship between quality of life and depressive symptoms and it showed that the strongest relationship between QOL and depressive symptoms was for the psychological domain, then the environmental domain, physical domain and the weakest relationship was with social domain.

In addition, the study found statistically significant relationships between quality of life and gender, age group, place of residency, marital status, educational level, psychological problems and depressive symptoms. The study did not find statistically significant relationships between quality of life and economic status, duration of illness, diabetes complications and seeking of psychotherapy.

Finally, the current study find relationships between depressive symptoms and gender, age group, place of residency, marital status, educational level, diabetes complications and psychological problems and no relationship with economic status, duration of illness and seeking psychotherapy to treat their psychological problems.

6.7. Section four: Limitations and recommendations

6.7.1. Limitations:

There are many limitations in the current study. For example, this study utilized a cross sectional design, due to the limitation of the available time and scarcity of resources. This makes it difficult to assess accurately the magnitude of effect exerted by each factor or to differentiate precisely whether the interaction between these factors would be advised or antagonistic. Also, this type of design may have limitations in the generalization of the results to a wider population since it measures both the prevalence of the outcomes and the determinants in a population at a point in time or over a short period of time (Horn et al. 2008). Nevertheless, the cross sectional studies are highly useful for descriptive purposes and it is relatively quick, cheap and easy to undertake (Grove & Burns, 2005; Monsen & Horn, 2008).

The data collection for this study was done by using a self- administered questionnaire. So, the reliability of the results may be affected, since the participants may hesitate to express their points of view or they may describe their own thoughts, feelings or behaviors in spurious way to please the researcher (Mitchell, 2000). Further, the sample included the users of the UNRWA primary healthcare services which may limit the generalization of findings to other users attending governmental or private healthcare services.

Finally, the sample size is considered not big; however, it included all youth with juvenile diabetes mellitus attending UNRWA clinics in West Bank.

6.7.2. Recommendations

6.7.2.1. Recommendations for policy makers:

- Increase the knowledge and awareness of mental health professional and counselors' about quality of life and depression among youth with juvenile diabetes mellitus in their primary care centers.

- Establishing databases about diabetes type 1 and all relevant issues including mental health problems such as depression among juvenile diabetes mellitus type 1.

- The UNRWA might cooperate with NGOs, private and community based organizations to build a national plan to improve quality of life and mental health of youth with diabetes mellitus in Palestine.

- Regular assessment of pain among youth with diabetes mellitus at UNRWA clinics should be done by health professional and medical and psychological interventions should be offered for them.

- Integrate depression screening for all patients with diabetes mellitus particularly for youth in each visit to UNRWA clinics in West Bank.

- Integrate quality of life components in the management and care of diabetes mellitus patients in UNRWA clinics.

- Train primary mental and health care professional particularly mental health counselors about quality of life, its components and assessment.

- Integrate regular assessment of quality of life for patients with diabetes mellitus particularly youth every 6 months at least.

- Multistep care (counseling, web-based intervention, parenting courses, treatment, referral to psychiatric services) should be provided to youth with diabetes mellitus and other mental disorders in primary clinics.

6.7.2.3. Recommendations for health and mental health professional:

- The community mental health counselors and professionals should focus on the negative thoughts associated with youth experience with diabetes mellitus in order to give a meaning to their life and to enjoy it by providing psychotherapy such as cognitive behavior therapy.

- The community mental health professional should do regular activity for youth with diabetes mellitus to spend leisure time inside each UNRWA clinics such as reading, music, expressive art and training.

- Mental health professional should focus on quality of life among high risk groups such as female, age group 21-24 years old, married and divorced patients, people who live in refugee camps, who have low educational level and psychological problems.

- Mental health professional should pay particularly attention to the presence of depression symptoms among high risk group such as female, age group 21-24 years old, married and divorce patients, people who live in refugee camps, have low educational level, who had diabetes complications and psychological problems.

- Regular assessment of depression among patients with diabetes mellitus should be done in each visit to the clinics and health workers should be watchful for the presence of depressive symptoms.

- Regular assessment of quality of life for youth with diabetes mellitus should be done at least every 6 months.

- Primary health care professional should do depression screening in a planned manner possibly by using BDI-PC for primary care, risk assessment and proper referral to mental health services for youth with juvenile diabetes mellitus.

6.7.2.4. Recommended research in the future:

- There is a need for further quantitative study to assess quality of life and depression among youth with juvenile diabetes mellitus in governmental clinics and private clinics

- There is a need for future study to explore depression experiences among youth with juvenile diabetes mellitus and its causes.

- There is a need for future qualitative study to explore the factors that affect quality of life among youth with juvenile diabetes mellitus.

- There is a need for further quantitative study to assess anxiety disorder among youth with juvenile diabetes mellitus.

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Appendix (A)

مقياس جودة الحياة

هذا الاستبيان يتعلق بمدى الرضى عن الصحة والجوانب المحيطة بحياة مريض السكري للفئة العمرية بين 15–24 سنة.

هذا الاستبيان يتعلق بمدى رضاك عن صحتك والجوانب المحيطة بحياتك. أرجو الإجابة على كل الأسئلة. إذا لم تكن متأكدا من الإجابات التي تريد اختيارها ، حاول أن تختار الإجابة التي تلاؤمك أكثر والتي يمكن اعتبارها إجابتك الأولى. إننا نسألك أن تفكر في حياتك خلال الأسبوعين الماضيين على وجه التحديد.

ضع إشارة (X) في الخانة المناسبة لإجابتك.

	ضعيف جداً	ضعيف	متوسط	جيد	جيد جداً
1) كيف تقيم جودة حياتك؟					
2) أنا راضي عن حياتي الاجتماعية والصحية والنفسية والبيئية التي أعيش فيها وكانت مثل توقعاتي					

	غير مقتنع تمامًا	غير مقتنع	متوسط	مقتنع	مقتنع تماماً
3) إلى أي مدى أنت راضي عن وضعك الصحي؟					

	أبدا	قليلاً	متوسط	كثيرا جداً	إلى أبعد الحدود
4) إلى أي مدى تشعر أن الألم الجسماني يمنعك من القيام بأداء شيء تحب تأديته؟					
5) إلى أي مدى تحتاج إلى العلاج الطبي حتى تؤدي مهماتك اليومية؟(الأدوية مثلا)					
6) إلى أي مدى تستمتع بالحياة؟ (مبسوط وسعيد بالحياة)					
7) إلى أي مدى تشعر أن حياتك ذات قيمة؟ (حياتك مهمة بالنسبة لك وللآخرين)					

الأسئلة التالية تستفسر عن مدى حجم أشياء معينة تعرضت لها خلال الأسبوعين الماضيين :

	أبداً	قيلاً	متوسط	كثيراً جداً	إلى أبعد الحدود
8) إلى أي مدى أنت قادر على التركيز؟					
9) إلى أي مدى تشعر بالأمان في حياتك اليومية؟					
10) إلى أي مدى تشعر بملائمة البيئة المحيطة بك لحياتك واحتياجاتك وتعتبرها بيئة صحية ؟ (المكان الذي تعيش فيه يتوفر فيه كل ما يلزمك ولا يوجد به ما يضر صحتك)					
11) هل لديك الطاقة الكافية لممارسة حياتك اليومية؟					

12) هل لديك القدرة على قبول مظهرك الجسماني؟ (هل أنت راضي عن شكلك)					
13) هل لديك المال الكافي لتلبية احتياجاتك؟					
14) إلى أي مدى تتوفر لديك المعلومات التي تحتاجها في حياتك اليومية ؟					
15) إلى أي مدى تتاح لديك الفرصة للأنشطة الترويحية في وقت الفراغ؟					

الأسئلة التالية تستفسر عن مدى شعورك بالاستحسان أو الرضا عن جوانب متعددة فى حياتك خلال الأسبوعين الماضيين :

	قليلا جداً	قليلاً	متوسط	جيد	جيد جداً
16) ما هو مدى قدرتك الجسمية على التحرك ؟ (لعب الرياضة، أنشطة مدرسية).					

	غير مرتاح أبدا	غير مرتاح	متوسط	مرتاح	مرتاح جداً
17) إلى أي مدى تشعر بالارتياح في نومك؟					
18) إلى أي مدى أنت راض عن مقدرتك في أداء أنشطتك اليومية؟(أكل، لباس، حمام)					
19) إلى أي درجة أنت راض عن مقدرتك في أداء عملك، أو دراستك					
20) إلى أي مدى أنت راض عن نفسك؟					
21) إلى أي مدى أنت راض عن علاقاتك الشخصية؟ (راض عن علاقتي بأصدقائي، أولادي					

وشريك حياتي وأقربائي وجيراني).					
22) إلى أي مدى أنت راض عن حياتك الجنسية؟					
23) إلى أي مدى أنت راض عن المساندة التي تجدها من أصدقائك؟					
24) هل أنت راض بالمنزل الذي تعيش فيه وتعتبره منزل مريح؟)					
25) إلى أى مدى أنت راض عن حصولك على الخدمات الصحية؟(ادوية , تامين صحي , عيادات قريبة)					
26) إلى أي مدى أنت راض عن توفر وسائل النقل لديك؟					

السؤال التالي يستفسر عن مدى شعورك أو تجربتك للقيام بأشياء معينة خلال الأسبوعين الماضيين:

	أبدا	**نادرا**	**أحيانا**	**في معظم الأحيان**	**دائما**
27) إلى أي مدى تنتابك مشاعر سلبية مثل الحزن واليأس والاكتئاب؟					

Appendix (B)

البيانات الشخصية

يتناول هذا القسم بيانات شخصية الرجاء وضع إشارة (X) في مكان الإجابة الملائمة للأسئلة :

1) العمر:

- 15 سنة – أقل من 18 سنة
- 18 سنة – أقل من 21 سنة
- 21 سنة – 24 سنة

2) الجنس:

- ذكر
- أنثى

3) مكان السكن:

- قرية
- مخيم
- مدينة

4) الحالة الاجتماعية:

- أعزب
- متزوج
- مطلق

- أرمل

5) المستوى التعليمي:

- غير متعلم
- ابتدائي (1–6 سنوات دراسية).
- إعدادي (6–9 سنوات دراسية).
- ثانوي (10–12 سنة دراسية).
- جامعي

6) الوضع الاقتصادي (حسب دخل الأسرة شهرياً):

- لا يوجد دخل.
- أقل من 1000 شيكل.
- من 1000 – أقل من 2000 شيكل.
- من 2000 – 3000 شيكل
- أكثر من 3000 شيكل

7) منذ متى أصبت بالسكري:

- أقل من 6 شهور
- 6 شهور – أقل من سنة
- سنة – أقل من 3 سنوات
- أكثر من 3 سنوات

8) هل أصبت بأية مضاعفات لمرض السكري؟ نعم لا

إذا كانت الإجابة نعم، أرجو تحديدها من القائمة التالية:

- مشاكل في العين.
- مشاكل في الكلى.
- مشاكل في الجهاز العصبي.
- مشاكل في القلب.
- مشاكل في القدم.
- مشاكل أخرى، أذكرها _____

9) هل تعاني من مشاكل نفسية إلى جانب مرض السكري ؟

- نعم
- لا

إذا كانت الإجابة نعم، أذكرها: _____

10) هل توجهت في الماضي لتلقي خدمة الإرشاد أو العلاج النفسي للمساعدة في حل مشاكلك النفسية؟

- نعم
- لا

إذا كانت الإجابة نعم:

أين: _____

نوع العلاج: _____

المدة الزمنية: _____

إذا كانت الإجابة لا ما الذي منعك من التوجه لطلب خدمة الإرشاد أو العلاج النفسي؟

- لأن العلاج النفسي غير فعال لحل مشاكلي النفسية.
- الوضع الاقتصادي لعائلتي.
- لتجنب وصمة المجتمع بأنني مريض نفسي.
- عدم معرفتي بالأماكن التي تقدم مثل هذه الخدمات.
- أسباب دينية.
- أسباب أخرى، أذكرها _____

Appendix (C)

مقياس بيك للإكتئاب

الاسم.....

التاريخ.....

ستجد/ي في هذه الاستمارة مجموعة من الجمل والاسئلة , أرجو أن تقرأها بتمعن ثم اختار الجملة التي تصف مشاعرك خلال الأسبوع الماضي. ضع دائرة حول رقم الجملة التي تناسب حالتك.

1) 0-أنا لا اشعر بالحزن.
   1- أنا اشعر بالحزن
   2- أنا حزين طيلة الوقت ولا أستطيع أن أتخلص منة.
   3- أنا حزين جدا أو غير سعيد إلى حد انني لا أستطيع تحمله.

2) 0-أنا بالذات لست غير متشجع (متحمس) نحو المستقبل
   1- اشعر بأنني غير مشجع نحو المستقبل
   2- اشعر بأنه لم يعد لدي شيء أتطلع إليه.
   3- اشعر بان المستقبل لا أمل فيه وان الأمور لا يمكن أن تتحسن.

3) 0-لا اشعر بأنني فاشل.
   1- اشعر بأنني قد فشلت أكثر من الإنسان العادي.
   2- عندما انظر إلى الفترة الماضية من حياتي فان كل ما اراه هو الكثير من الفشل.
   3- اشعر أنني فاشل تماما كشخص.

4) 0-احصل على الرضى الكثير من الأشياء كما تعودت دائما

1- لم اعد استمتع بالأشياء بنفس الطريقة التي كنت متعودا عليها.

2- لم اعد احصل على الشعور بالرضى الحقيقي من أي شيء بعد الان.

3- أنا غير راضي أو اشعر بالملل من كل شيء.

5) 0-لا اشعر بالذنب خاصة

1- انني اشعر بالذنب جزءا كبيرا من الوقت.

2- اشعر بالذنب تقريبا معظم الوقت.

3- اشعر بالذنب طيلة الوقت.

6) 0-لا اشعر بأنني أعاقب.

1- اشعر انني سوف اعاقب.

2- أتوقع أنني سأعاقب.

3- اشعر بأنني اعاقب.

7) 0-لا اشعر بخيبة أمل من نفسي.

1- اشعر بخيبة أمل من نفسي.

2- أنا مشمئز من نفسي.

3- أنا أكره نفسي.

8) 0-لا اشعر إنني أسوء من اي شخص اخر.

1- أنا انتقد نفسي على ضعفي او أخطائي.

2- إنني ألوم نفسي طيلة الوقت على أخطائي.

3- إنني ألوم نفسي على أي شيء سيء يحدث.

9) 0-لا يوجد لدي اي أفكار لقتل نفسي.

1- يوجد لدي أفكار لقتل نفسي ولكنني لن انفذها.

2- اود ان اقتل نفسي.

3- اود ان اقتل نفسي إذا أتيحت لي الفرصة.

10) 0-لا ابكي أكثر من المعتاد.

1- انني ابكي الان أكثر مما كنت.

2- إنني ابكي طيلة الوقت الان.

3- لقد كنت قادرا على البكاء , ولكنني الآن لا أستطيع أن ابكي رغم أنني أريد ذلك.

11) 0 – أنا لا انرفز من الاشياء أكثر مما كنت عليه دائما.

1- أنا الان انرفز قليلا أكثر من المعتاد.

2- انا منزعج او منرفز معظم الوقت

3- اشعر أنني منرفز طوال الوقت الآن.

12) 0-لم أفقد اهتمامي بالناس الآخرين.

1- انا اقل اهتماما بالناس الآخرين مما كنت عليه من قبل.

2- لقد فقدت معظم اهتمامي بالناس الآخرين.

3- لقد فقدت كل اهتمامي بالناس الآخرين.

13) 0-أستطيع اتخاذ القرارات كما كنت سابقا.

1- أتجنب اتخاذ القرارات أكثر مما كنت متعودا.

2- أجد صعوبة كبيره في اتخاذ القرارات أكثر من ذي قبل.

3- لا استطبع بتاتا اتخاذ القرارات بعد الان.

14) 0-لا اشعر بأنني أبدو أسوء مما كنت.

1-أنا قلق لأنني أبدو كبيرا و غبر جذاب
2-اشعر أن هناك تغيرات دائمة في مظهري الشخصي مما يجعلني أبدو غير جذاب.
3-اعتقد أنني أبدو بشعا.

15)0-أستطيع ان اعمل جيدا كما كنت سابقا.
1-احتاج إلى جهد إضافي من اجل البدء بعمل شيء ما.
2-يجب ان ادفع نفسي بصعوبة بالغة لعمل اي شيء.
3 -لا أستطيع القيام بأي عمل اطلاقا.

16) 0-أستطيع أن أنام كالمعتاد.
1-لا انام جيدا كما تعودت.
2-استيقظ ساعة أو ساعتين مبكرا أكثر من المعتاد واجد صعوبة في العودة للنوم
3 استيقظ مبكرا عدة ساعات أكثر مما تعودت ولا أستطيع العودة إلى النوم.

17) 0-لا اشعر بالتعب أكثر من المعتاد.
1-اتعب بسهولة أكثر مما تعودت.
2-اتعب من القيام بأي شيء تقريبا.
3-انا متعب كثيرا لفعل اي شيء.

18)0-شهيتي للأكل ليست سيئة أكثر من المعتاد.
1-شهيتي للأكل ليست جيدة كما كانت علية.
2-شهيتي للأكل أصبحت أسوء بكثير الآن.
3-لم يعد لدي شهية للأكل.

19)0–لم أفقد كثيرا من وزني (إذا كان) مؤخرا.
1–فقدت أكثر من 2 كيلو من وزني.
2–فقدت أكثر من 4.5 كيلو من وزني.
3فقدت أكثر من (6.5 كيلو) من وزني.
(اذا حاولت تنقيص وزنك عن قصد اعطي القيمة صفر(0) لهذه الاجابة).

20)0–انا لست قلقا على صحتي أكثر من المعتاد.
1–انا قلق بشأن المشاكل الجسدية مثل الآلام، واضطراب المعدة او الامساك.
2–انا قلق كثيرا بشأن المشاكل الجسدية وانه لمن الصعب أن أفكر كثيرا في اشياء أخرى.
3 انا قلق جدا بشأن مشكلاتي الجسدية لدرجة أنني لا أستطيع التفكير في اي شيء اخر.

21)0– لم ألاحظ أي تغيير جديد في رغبتي بالجنس .
1–انا اقل اهتماما بالجنس أكثر مما كنت عليه سابقا.
2–انا اقل اهتماما بالجنس كثيرا الان.
3 – لقد فقدت رغبتي في الجنس كليا.