An-Najah National University
Faculty of Graduate Studies

Type 1 Diabetes Mellitus in Northern Palestinian Community

By

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DEDICATION

To My Beloved Family with Love

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Acknowledgment

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List of Contents

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All Rights Reserved - Library of University of Jordan - Center of Thesis Deposit

List of Tables

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Abstract

In Palestine, studies on diabetes and diabetic patient were limited. With respect to type 1 diabetes no available data of any nature is available. The current study aimed at evaluating the effect of health services provided by governmental clinics on type 1 diabetic patient's in the northern parts of the West Bank area.

All cases enrolled at the diabetic centers of the cities of Nablus, Jenin and Tulkarm were interviewed and the data was collected using a specially designed questionnaire. A total of 100 cases, representing all admitted cases over a period of 1 year (September 2000-September 2001), were enrolled. Data was analyzed using the Statistical Package for Social Sciences (SPSS).

The findings of the current study showed that the study population was distributed as follows: 51 from Nablus diabetic center, 31 from Jenin center and 18 from Tulkarm center. Equal representation for both males and females was observed with a mean age of disease onset of 4.95 years. It was also found that 20% of the study population reported to have first degree relative with diabetes.

Among the study population 84% were reported to have episodes of hypoglycemia, while 96% were reported to have episodes of hyperglycemia as complications associated with the disease.

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The findings on the association between recommended daily practices (changes in diet and physical activities, home monitoring of sugar level in blood and urine and blood sugar level adjustment through insulin and diet) and presence of complications (hypo-hyperglycemia) showed that no statistical significant association between such practices and improvement of health status of the patients.

With respect to clinical (consultations with dibetologist and dietitians) and educational services about diabetes, offered in these centers, and its effect on the control of patients blood sugar level, our findings showed that such services did not show any improvement on the health status of these patients. Our data shows that 46.0% of those who attended consultation sessions with dietitian were with controlled random blood sugar and 20.0% for those who attended consultation sessions with diabetologist were with controlled random blood sugar.

Association with recommended health practices and control of blood sugar also showed no significant improvement on the health status of these patients with the exception of home monitoring of blood sugar level as 90% of those who practiced this activity were with controlled acceptable blood sugar levels.

The effect of diabetic complication on the quality of life showed that less than 50% of the study population who had either hypo or hyperglycemia were able to cope with their normal life activities and

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around 18% of this group were able to cope with recommended diet regimes. With respect to patients satisfaction with the offered services, 87% of them seems to be satisfied with what is offered by their centers, although no any noticeable improvement on their health status.

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CHAPTER I
INTRODUCTION

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1.1 General clinical description

Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Such a deficiency results in increased concentrations of glucose in the blood, which in turn damage many of the body's systems, in particular the blood vessels and nerves (WHO information, 2002).

Diabetes mellitus may present with characteristic symptoms such as thirst, polyuria, blurring of vision, and weight loss. In its most severe forms, ketoacidosis or a non-ketotic hyperosmolar state may develop and lead to stupor, coma, and, in absence of effective treatment, death (Report of a WHO Consultation, 1999). The symptoms of diabetes may be pronounced, subdued, or even absent (WHO information, 2002).

Recently there has been major growth in knowledge about the pathogenesis and etiology of different types of diabetes and about the predictive value of different blood glucose for development of complications which was supported by numerous epidemiological studies. The classification by etiological type results from new knowledge of the causes of hyperglycemia, including diabetes (Colman, *et al.*, 1993).

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1.2 Classification of diabetes mellitus

In response, both the American Diabetes Association (ADA) (Report of the Expert Committee, 1997) and the World Health Organization (Albert and Zimmet, 1998) have re-examined, redefined and updated the classification of new criteria for diabetes (Colman, *et al.*, 1993). The use of the new classification system and standardized diagnostic criteria facilitates a common language among patients, physicians, other health care professionals and scientists. Clinically two principle forms were identified:

1. Type 1 diabetes formerly known as insulin-dependent diabetes mellitus (IDDM), in which the pancreas fails to produce the insulin which is essential for survival. This form develops most frequently in children and adolescents, but is being increasingly noted later in life.
2. Type 2 diabetes formerly named non-insulin-dependent diabetes mellitus (NIDDM) which results from the body's inability to respond properly to the action of insulin produced by the Pancreas (WHO information, 2002), either by insulin resistance in the peripheral tissue or an insulin secretary defect of the Beta Cells (Report of the Expert Committee, 1997; National Diabetes Data Group, 1997). This is the most common form of diabetes, and is highly associated with a

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family history of diabetes, older age, obesity and lack of exercise (Mayfield J., 1996).

Since the study concerned with type 1diabetes there will be a focus on this type throughout the text.

1.3 Description of etiological types

The etiological types designate defects, disorders or processes of which often result in the development of diabetes mellitus Patients with any form of diabetes may require insulin treatment at some stages of their disease. Such use of insulin does not, of itself, define the etiological class. In general, there are four distinct types, these include:

1.3.1 Type 2

Type 2 predominantly resistant to insulin uptake with relative insulin deficiency in some cases, however, in other cases it is predominantly an insulin secretary defect with/without insulin resistance. At least initially, and often throughout their lifetime, these people do not need insulin to survive. This form of diabetes is frequently undiagnosed for many years because hyperglycemia is often not severe enough to provoke noticeable symptoms of diabetes (Mooy, *et al.* 1995; Harris, 1993). Nevertheless, such patients are at increased risk of developing macrovascular and microvascular complications. The etiology of type 2 is multifactorial and

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probably genetically based, but it also has strong behavioral component (Albert and Zimmet, 1998).

1.3.2 Type 1

Type I beta-cell destruction, usually leading to absolute insulin deficiency. The most widely accepted hypothesis about the etiology of type 1 diabetes is that the disorder is multifactorial in origin, involving a complex interaction between genetic predisposition, immunological determinants and environmental agents (Bottazzo, *et al.,* 1993; Bach, 1994; Bosi, *et al.,* 1987). The followings are the most common etiological factors recognized in type 1.

-Autoimmune diabetes mellitus: This form of diabetes results from autoimmune-mediated destruction of the beta cells of the pancreas. The rate of destruction is quite variable, being rapid in some individuals and slow in others (Zimmet, *et al.,* 1994). The rapidly progressive form is commonly observed in children, but also may occur in adults (Humphrey, *et al.,* 1998). The slowly progressive form generally occurs in adults and is sometimes referred to as latent autoimmune diabetes in adults (LADA). Some patients, particularly children and adolescents, may present with ketoacidosis as the first manifestation of the disease (Japan and Pittsburgh Childhood Diabetes Research Groups, 1985). Others have modest fasting hyperglycemia that can rapidly change to severe

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hyperglycaemia and/or ketoacidosis in the presence of infection or other stress. Still others, particularly adults, may retain residual beta-cell function, sufficient to prevent ketoacidosis, for many years (Zimmet, 1995). Individuals with this form of Type 1 diabetes often become dependent on insulin for survival eventually and are at risk for ketoacidosis (Willis, *et al.,* 1996). The peak incidence of this form of Type 1 diabetes occurs in childhood and adolescence, but the onset may occur at any age, ranging from childhood to the ninth decade of life (Molbak, *et al.*, 1994).

-Idiopathic: There are some forms of Type 1 diabetes, which have no known etiology. Some of these patients have permanent insulinopenia (decreased secretion of insulin) and are prone to ketoacidosis, but have no evidence of autoimmunity (Mclarty, *et al.,* 1990). In another form an absolute requirement for insulin replacement therapy in affected patients may come and go, and patients periodically develop ketoacidossis (Ahren and Corrigan, 1984).

1.3.3 Gestational diabetes

Gestational diabetes is mainly due to insulin resistance and seen in some pregnancies (Robbins, Cotran, and Kumar, 1994a).

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1.3.4 Other types

These include a wide range of specific conditions and syndromes as genetic defect of beta cell function, drugs or chemicals induced, tumor and pancreatitis types (Robbins, Cotran, and Kumar, 1994a; National Diabetes Data group, 2001).

1.4 Criteria for diagnosis

The new WHO criteria for diagnostic of diabetes mellitus and hyperglycemia proposed by ADA and accepted by WHO based on fasting plasma glucose levels of 126mg /dl or higher and/or two hour post-glucose load with clinical symptoms of diabetes include polyuria, polydipsia or unexplained weight loss. WHO retained oral glucose tolerance test (OGTT) as a standard method (Report of the Expert Committee, 1997). These diagnostic criterions are recommended for gestational diabetes (Albert, *et al.,* 1998).

1.5 Signs and symptoms

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The classic early signs and symptoms in Type 1 include:

- Fasting Blood Glucose–test readings of more than 126 mg/dl and a readings of more than 200mg/dl after a meal – post-absorptive (Report of the Expert Committee, 1997).
- Excessive amounts of sugar in the urine (glucosuria).
- Increased urination (polyuria)

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- Increased thirst (polydipsia)
- Increased appetite (polyphagia)
- Dramatic weight loss
- Dehydration
- Weakness and tiredness (Linda and Betschart, 1986; Belinda, 1990).

If insulin is not replaced other serious complications may develop:

1- Hyperglycemia (high blood sugar): occurs when the body has too little, or insufficient, insulin or when too much food is eaten with the classical symptoms of diabetes.

2- Ketoacidosis (Diabetic coma): occurs when the body lacks insulin or cannot make use of the insulin available with more severe and severe symptoms of the classical ones like:

- Ketones in the blood (ketonemia)
- Ketones in the urine (ketonuria)
- Fruity-smelling breath
- Labored breath
- Nausea and Vomiting
- Abdominal pain
- Drowsiness leading to unconsciousness

3- Hypoglycemia (low blood sugar): the most common medical emergency for child with diabetes. It must be treated promptly

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because progression of the case may lead to brain damage or death. This case may be accompanied by these symptoms: Irritability, Sweating, Confusion, Nightmares, Headache, Crying, Dizziness, Shakiness, Pallor, Fatigue, Hunger, Sleepiness, Rapid pulse, Poor coordination and Personality changes (Ahren, and Corrigan, 1984; Robbins, Cotran and Kumar, 1994a).

Diabetes is classified among the group of chronic, non-communicable diseases. As a public health problem, diabetes occupies a front place in the attention of health professionals (Zimmet and Lefebvre, 1996). This is because of high and rapidly increasing contribution of diabetes to the morbidity and mortality in the affected population (Midthjel, *et al.,* 1995). Type 1 represents the most serious form of clinical diabetes mellitus. It affects the young population in the productive age, whereas for Type 2, the problem affecting mostly the elderly population (Techno-Economic Analysis Network in the Mediterranean, 1999). Diabetes is deadly regardless of age or income, people suffering from type 1 diabetes face great mortality risk. According to reports by the British Medical Journal, even the most affluent diabetic patients with type1 diabetes had a greater risk of death than their poorer, non-diabetic neighbors. Diabetes exerts its impact on governments, health sectors, and societies. Direct costs to individuals and their families include medical care, drug, insulin, and

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other supplies, certain types of food, drinks, and candies with probability of potential loss of income.

Diabetes treatment can be time-consuming, inconvenient and uncomfortable (WHO information, 1999). Recently compiled data show that approximately 150 million people have diabetes mellitus worldwide, and that this number may well double by the year 2025. Much of this increase will occur in developing countries (WHO information, 2002). Type 1 diabetes is accounting for 5-10% of all cases (Laporte, *et al.*, 1999; Lewis, 2002).

1. 6 Risk factors

1.6.1 Genetic factors

It has long been suspected that genetic plays an important role in type 1 diabetes. Results from twin data, familial clustering of the disease and difference in incidence according to ethnicity infer the presence of specific disease genes (Buzzetti, *et al.*, 1998).

Nearly 20 different genes can affect the risk for developing diabetes. Human leukocyte antigen - HLA region (Noble, *et al.*, 1996; Todd, 1995) and the insulin gene (Noble, *et al.*, 1996; Follis and Bottazzo, 1998) are thought to play central role in the disease.

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1.6.2 Autoimmune factors

In type1 diabetes, the immune system fails to distinguish between its own Beta cells and an infectious agent and begin to attack and destroy the insulin producing cells of the pancreas in a process called an autoimmune process. The autoimmune attack against beta cells often initiates several years before clinical onset of type1 diabetes (the so called prolonged latency period) (Sepe, *et al.,* 1997). More research is needed to identify a reliable set of immunological markers that will screen and predict as accurately as possible population at risk for the disease, and this is particularly true in the general population (Songini, *et al.,* 1998).

1. 6.3 Environmental factors

Although researchers have found gene mutations that increase the risk of developing type 1 diabetes, these genes alone do not cause the disease. There must be a combination of genetic risk and environmental factors to trigger diabetes (Doman, *et al.,* 1999). Twin studies, major geographical variations in incidence rates, temporal trends in incidence and findings in migrant studies indicate that environmental factors play a crucial role in the development of Type 1 diabetes (Hans, *et al.,* 1998). The following observations show the role of some environmental factors:

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1- Cow's milk: the use of cow's milk early in infancy seems to increase the risk of developing Type 1 in people with a genetic risk and it was explained by the findings of certain proteins that are similar to a protein found on beta cells. (Hans, *et al.,* 1998; Scott, 1990)

2- Viruses: Certain type of viral infections, particularly Coxsackie B, rubella, and mumps are also associated with possible increase risk of developing Type 1diabetes in people under age of five (Harrison, *et al.*, 1999; Wagenknecht, *et al.*, 1991). Some researchers think that the virus triggers an immune reaction against the islet cells or in rare cases directly infects and kill these cells. Similarities in protein contents between viruses and islet cells may also involve in the process of developing type 1 (Wagenknecht, *et al.*, 1991; Bottazzo, 1986).

1.7 Chronic irreversible complications of diabetes

Diabetes complications can be divided broadly into those that occur in the short term (the acute complications) and those that occur over a long time (the chronic complications).

Short term / acute complications-

The primary complications, which occur most commonly in Type 1 diabetes, may appear relatively rapidly and are directly related to the level of blood glucose. If blood sugar levels are not carefully

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managed, people with diabetes can suffer short-term complications including:

Hypoglycemia - low blood sugar

Hyperglycemia - high blood sugar

Ketoacidosis - a buildup of ketones in the body

Hyperosmolar hypoglycemic nonketotic syndrome (HHNS) - a condition associated with severe dehydration and can lead to shock.

Long-term / chronic complications-

Long-term complications of diabetes are divided into macrovascular (large blood vessel) and microvascular (small blood vessel) disease. The long-term complications of diabetes are caused by decreased blood flow to these vessels.

I. **Macrovascular Complications** - includes those blood vessels that supply the heart, brain, and,extremities;

A. Atherosclerotic heart disease
B. Myocardial Infarction and Sudden Death
C. Peripheral Vascular Disease
D.Cerebrovascular disease
E. Renal Artery Stenosis

II. **Microvascular Complications** - includes those blood vessels that supply the eyes, nerves, and kidneys;

A. Diabetic Retinopathy
B. Diabetic Nephropathy
C. Diabetic Neuropathy

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1.7.1 Macrovascular Complications

Accounts for approximately 50% of all deaths among people with diabetes in industrialized countries, and accounts for 25% of deaths among patients with onset of diabetes before the age of twenty years (America Associated Diabetes, 2002). Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes (National Center for Chronic Disease Prevention and Health Promotion, 1998).

1.7.2 Diabetic retinopathy

Diabetic retinopathy is considered as one of the leading cause of blindness and visual disability world wide. Studies suggest that, after 15 years of diabetes, approximately 2% of people become blind, about 10% develop severe visual handicap (WHO information, 2002). Diabetes is the leading cause of blindness among adults aged 20-74 years old (National Center for Chronic Disease Prevention and Health Promotion, 1998). Males with younger age onset diabetes develop retinopathy more rapidly than females with younger age onset of diabetes.

1.7.3 Kidney failure

Diabetes is the leading cause of treated end-stage renal disease (ESRD), but its frequency varies between populations and is also

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related to the severity and duration of the disease (WHO information, 2002). In USA study in 1999 showed that diabetes accounts for 43% of kidney failure new cases, 38,160 diabetic people began treatment for end-stage renal disease, and 114,478 underwent dialysis or kidney transportation (National Center for Chronic Disease Prevention and Health Promotion, 1998). Patients with diabetes type 1 who develop proteinuria, ESRD or death usually follow after about 5-10 years.

1.7.4 Diabetic neuropathy

It is the most common complication of diabetes. Studies suggest that up to 50% of people with diabetes are affected to some degree. Major risk factors of this condition are the level and duration of elevated blood glucose (WHO information, 2002). Severe forms of diabetic nerve disease are a major contributing cause of lower-extremity limb amputations (National Center for Chronic Disease Prevention and Health Promotion, 1998).

1.7.5 Amputations

It is one of the most costly complications of diabetes, especially in communities with inadequate footwear (WHO information, 2002). In USA from 1997 to 1999, about 82,000 non-traumatic lower (limb amputations) which is around more than 60% were done each year

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among diabetic people (National Center for Chronic Disease Prevention and Health Promotion, 1998).

1.8 Epidemiology of diabetes mellitus

Diabetes epidemic is underway an estimated 30 million people worldwide had diabetes in 1985. By 1995, this number had shot up to 135 million. Now, WHO predicts arise to an alarming 300 million by 2025 (WHO, 1999). The majority of new cases is expected in the developing countries due to adaptation of westernized nutritional life style (WHO, 1994).

Type 1 diabetes is common in European populations and is rare in Asians, Native American, Pacific Islanders and Blacks. There are almost 60 fold differences between the countries with the highest incidence (Finland, Other Scandinavian countries) (Karvonen, *et al.*, 1993; Bottazzo, *et al.*, 1997) and those with the low incidence such as in Peru (Karvonen, *et al.*, 1993).

Tow recent major reports looking at the global patterns for diabetes, one from International Diabetes Institute (Amos, McCarty, Zimmet, 1997) and another from the World Health Organization in Geneva (King, Aubert and Herman, 1998) have highlighted the global epidemic and predicted major increases in the number of cases of both Type 1 and Type 2 diabetes. Available data in this respect indicates

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that Type 1 diabetes is expected to be 40 % higher in the year 2010 compared to that reported for 1998 (Amos, McCarty and Zimmet, 1997). A review by Onkamo *et al.*, 1994 (studies reported from 1960 to 1996) showed that the over all increase in incidence was 3.0 % per year, thus, indicating a worldwide increase in the incidence of Type 1 diabetes, and the increase is particularly high in populations with low incidence.

Diabetes has become a particularly serious problem in a number of North African and Middle East countries too (Ajlouni, Jaddou and Baticha, 1998). Type 1 diabetes accounts for 6-10 % of diabetic cases in different Mediterranean countries. With few outstanding exceptions (e.g. Sardinia, Finland, and Kuwait), the prevalence of this type of diabetes seems to be fairly stable (Amos, McCarty and Zimmet, 1997).

1.8.1 Epidemiology of diabetes in Arab World

Since 1999 a study called EURODIAB-ACE was conducting to study epidemiological characteristics of type 1 diabetes including incidence rate. The incidence rate of 8.1, 7.7, 10.1, 3.6 and 15.4 per 100,000 were reported in Algeria, Tunisia, Libya, Jordan and Kuwait, respectively. Egypt, Lebanon, Saudi Arabia and Syria have no data available. Kuwait has the highest incidence rate among Arab countries (Green, Gale and Patterson, 1992). A dramatic increase in

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incidence of type 1 in Kuwait has been documented and quantified since 1983 to following decade (Taha, *et al.*, 1983).

1.8.2 Epidemiology of diabetes in Palestine

The demographic and health situation of the Palestine is unique. Palestine is undergoing a dual faceted epidemiological transition similar to that of middle-income countries. Disease patterns are characterized by diseases typical of developing countries on one hand respiratory infections, diarrhea, and parasitic diseases), and diseases of developed countries (hypertension, diabetes, cancer) on the other hand (Michaela V. Pfeiffer, 2001). Reliable data in key areas such as morbidity and mortality and other health status measures are lacking in Palestine (The impact on Palestinian Economy of Confrontations, 2001). According to National Health Plan for the period 1999-2003, the current health information system (HIS) is inadequate and lacks standard operations both at regional and national levels. Health data is generally broken down by region (West Bank and Gaza Strip) but is not commonly stratified by age and sex (The impact on Palestinian Economy of Confrontations, 2001).

Studies enlightening the epidemiology of diabetes in the Palestinian community are scarce. Data about the prevalence rate are extracted from the registries of health services in governmental and

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UNRWA diabetes clinics (Shaar, 1996). Patients attending private sector or undiagnosed cases are mostly the reason behind the underestimated incidence of diabetes (UNRWA, Annual Report, 1992). In 1995 the Community Health Department, Bir-Zeit University conducted a study that showed an increased role of diabetes in morbidity and mortality rates. This study included surgical reports from Al-Ahli-Hospital at Hebron and found that diabetes complications were behind most of the amputation operations. A study on the prevalence of diabetes in Palestine is conducting by Al-Quads University in which the primarily result show that the prevalence rate is 7-10% among Palestinians 15-68 years of age (AL-Quads University Study, 2000).

According to WHO 1998 World Health Statistics Annual Report, the estimated prevalence of Diabetes Mellitus in Egypt, Jordan, and Syria is 2-12%. The situation in Palestine is probably similar since many of the same risk factors (unhealthy diet, obesity, and sedentary lifestyle) are present (Zynia L. Rionda, Andrew Clements, 2000). If Palestine follows worldwide trends, 10-15% of these cases would be Type 1, or insulin dependent patients. Factors affecting the occurrence of Type 1 diabetes in Palestine are not well studied. Genetic, environmental and diet factors are thought to influence the

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disease occurrence, as in many other communities affected by the problem (Union of Palestinian Medical relief Committees, 1992).

1. 9 Economic aspects of diabetes

At the national level, the expenses spent on diabetes in different studied countries show the high costs of diabetes care. As the number of people with diabetes grows worldwide, the disease takes an ever-increasing proportion of national health care budgets. Diabetes is projected to become one of the world's main disasters and killers within the next twenty-five years. Because of its chronic nature, the severity of its complications and the means required to control them, not only for the affected individuals and their families, but also for the health authorities (Zimmet and Lefebvre, 1996).

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The world Health Organization (WHO) estimates that four to five percent of health budget are spent on diabetes-related illness (Canadian Diabetes Association, 2000). Diabetes is thought to be responsible for doubling the expenditure on health care (WHO, 1991). WHO estimates that, for a low-income Indian family with an adult with diabetes, 25 % of income will be devoted to diabetes care. As for USA, the corresponding figure is 10%.WHO also estimates that the total health care costs of person with diabetes in the USA are three times those for people without the condition. In 1997, diabetes costs

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American Authority around 98 billion dollar, 44 billion dollar in direct medical costs and 54 billion dollar as indirect costs in lost of productivity due to disability, work loss, premature mortality each year. The costs of diabetes affect every one, every where, but they are not only a financial problem. Intangible costs also have great impact on the lives of patients and their families and are most difficult to quantify (Zimmet and Lefebvre, 1996).

1.9.1 Burden of disease in Palestine

Costs data on treatment and management of chronic disease in Palestine are not readily available. In 1997 a study based on limited interviews with Palestinian medical specialist in diabetes mellitus, the assessment team arrived at some costs for treating and management of diabetes. It was estimated 10-15% of cases in Palestine would be type 1, or insulin injection cases. One insulin injection reportedly costs 120 NIS, these patients will need to take these injections for the rest of their lives, assuming their condition does not worsen (Zynia, *et al.*, 2000; Elayyan, Ramallah Diabetes Center, 2000). According to this study diabetes was ranked as high cost disease, medium for mortality and morbidity and with group at greatest risk of >20 years of age and considered as the eighth cause of death in West Bank and Gaza (Annual Report of Palestinian Ministry of Health, 1997). In general,

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the disease burden in Palestine is similar to that of the region with some exceptions as diabetes was found to be higher than elsewhere in the Eastern Mediterranean region as Kuwait (Zynia, *et al.*, 2000).

1.10 Aims of study

Since no previous studies were conducted regarding care, self care management, prevention, prevalence and associated risk factors of Type 1 diabetes in Palestine, the current study aimed at:

1. Assess the status of the disease in the northern districts
2. Assess available services
3. Assess knowledge attitude practice of patients (KAP)
4. Assess impact of offered services on disease control
5. Assess disease complications
6. Assess patients quality of life

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CHAPTER II
STUDY DESIGN and METHOD

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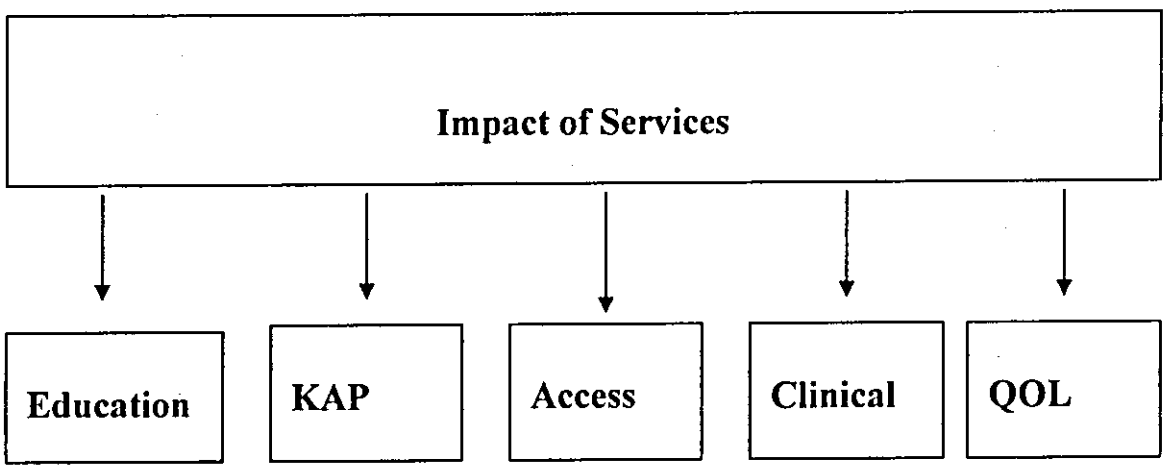
2.1 Conceptual framework of the study

The following is an assessment of services offered to type 1 diabetic patients and its impact on diabetic patients.



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2.2 Background

The study was conducted in the northern districts of the West Bank area of Palestine, Nablus, Jenin and Tulkarm. These districts are considered the main centers for primary healthcare provision in northern Palestine and with a total population of around 646 thousand. The districts are all with similar demographic structure with urban, rural and refugee populations. There are four major health care providers operating in the Palestinian territories and in the study-selected areas: The Ministry of Health (MOH), United Nations' Relief and Working Agency (UNRWA), Non Governmental Organizations (NGOs) and Private Sectors. The major providers of primary care services are MOH and UNRWA. The governmental health sector is the largest one providing health services. Diabetes care clinics are based in the central primary health care facilities in respective districts and offer services to the attachment's area residents in cities and villages. Within the diabetic clinics in the primary health care, special programs for diabetic population are implemented according to; MOH protocols and adopted policy of diabetic care and UNRWA in refugee camps diabetic clinic. Governmental Diabetic Clinics of the primary health care system within the Ministry of Health in Nablus, Jenin and Tulkarm cities were selected to conduct the present study.

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Governmental diabetic clinics are the largest sector in providing diabetes care in Palestine. Categorization to the type of diabetes and treatment followed the clinical diagnosis made by the treating physician in the diabetic clinic. Information system is running represented by a record for every diabetic patient with serial number, demographic information, family medical history, vital signs, weight and height, body mass index, laboratory results, medicine type and doses. New appointment is given for every patient after each visit to the physician. Time of the next visit is controlled by his clinical situation and the time of disease onset which mostly monthly appointment. Diabetic clinic run by one physician through all weekdays for both types of diabetes. Medical staff inside diabetic clinic consists of the physician, nurse, and sometimes with health educator. All patients with type 1 diabetes have a certain day in the week for their medical consultation. Medication doses are provided to patients once every month. Permissions to conduct the study in diabetic clinics were obtained from the Ministry of Health.

2.3 Study limitations

Because of Al-Aqsa Intifada, which began on September 2000 against Israeli occupation many difficulties, faced this study in reaching the patients in the clinics.

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Checkpoints formed a major factor to limit the researcher's access to the clinic at the proper time to meet the patients who came early from their villages to cross the long lines at the checkpoints or through crossing mountains and then to go back home. The followings are some obstacles that we faced in our study:

- Sometimes curfew was imposed on the cities through the clinic daytime and all patients have to hurry to go back to their home.
- Sometimes patients couldn't cross-checkpoints to clinic to take their medication.
- With exception of Jenin, diabetic clinic centers there was no information system about type 1 diabetic patients including total patient no., patients file no.
- Absence of statistical data about total count number of diabetic patient's type1 neither in Palestine nor in northern Palestine was found from Ministry of Health in Nablus city.
- Absence of statistics about the whole number of diabetes type 1 patients in Palestine from Ministry of Health in Nablus city. The only data available was number of patient's visits.

2.4 Sample selections

The study focus on Type 1 diabetic patients with ages between 1-18 years receiving health care in the three selected clinics: Nablus, Jenin,

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Tulkarm. Difficult and even impossible access to Qalqilia city one of the northern cities, imposed the exclusion of Qalqilia diabetic patients.

The reasons for focusing on Type 1 patients were that:

- Type 1 Diabetes Mellitus represents the most serious form of diabetes Mellitus with increasing incidence in Middle East countries. (Belinda Childs, 1990).
- Victims of type1 diabetes are mostly children at young age so complications develop at a relatively early age and may render patients chronically ill and often disabled for many years.
- Estimations on Palestinian population size (PCBS, 1998) shows that 47 % of the population being under fifteen years, and if Palestine follows worldwide trends, 5 –10% of all diabetic cases in Palestine would be Type 1, or insulin injecting patients.
- Although type 1 diabetes is of low frequency relative to type 2 diabetes, the socioeconomic, psychological and community costs are as large or even greater.
- Researches enlightening the prevalence and incidence rate of diabetes type 1 in Palestine are absent.

A total 100 cases with type 1 Diabetes Mellitus were enrolled in the study (all attending diabetes care centers in the cities of Nablus, Jenin and Tulkarm). Patients were requested to participate in the study by

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answering the study questionnaire through an interview with the researcher. Researcher conducted all interviews with patients or their caretaker (mother/father) with the help of the diabetes care worker when available at the clinic.

The response rate was high; this response was probably due to:

- Patients and their parents like to talk about their disease and their emotions.
- The corporation of the staff in proposing the study and the researcher to the patients.
- Some patients believed that the research could be of that help to their disease.
- Others hoped to have some help in providing extra insulin injection, syringes and needles.
- Non- respondents: were five cases with ages sixteen-eighteen years old with long duration of disease, very depressed of their disease, medication and the system they dealing with.

The clinics have assigned special days for these patients and the rotation was as follows: Nablus city on Sunday; Jenin city on Tuesday; and no assigned day for Tulkarm due to the limited number of participated patients from that center. Centers usually provide consultation, medication, and laboratory diagnostic tests.

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2.5 Tool of data collection (Questionnaire)

A questionnaire was developed for the study with the aim to cover the most important sections of interest concerning the patient's life and services offered in the studied clinics. The study questionnaire contains the following sections:

2.5.1 General background information

2.5.1.1 Demography

Demography data included: Age, Sex, Education, Residence, Family member, and Duration of the disease.

2.5.1.2 Access to clinic services

Questions related to the effect of the Intifada and the prevailing political situation on receiving clinical consultation and insulin medication.

2.5.1.3 Offered services

Services of specific importance concerning diabetes care were selected and evaluated. These include educational services and clinical services:

The clinical services with biomedical orientation related to control of disease and include: Consultation with GP, Consultation with Dietitian and Consultation with Diabetologist.

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The educational services provide patients with knowledge and needed skills to improve their self care, diet regime, required physical activity and home monitoring.

2.5.1.4 Knowledge

Knowledge test was carried to evaluate the patient's knowledge concerning aspects to empower patient's self-management and included: Knowledge about diet regime, hypoglycemia and hyperglycemia complications and symptoms, tools self-care management and physical activities.

2. 5.1.5 Practices

Practices are daily activities that provide patient with self-control of the disease that delay or prevent disease complications. These are usually followed diagnoses and include: Practicing diet regime; physical activity (extra the normal daily activity) and home monitoring of their blood sugar.

25.1.6 Clinical status

For this purpose four variables were identified as indicators for the clinical status (2 clinical symptoms and 2 were related to complications). These were as follows:

Clinical: 1. Controlled patients with values of fasting blood sugar for the last measurements 140 mg/dl or below. 2. Controlled patients with

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values of random blood sugar for the last measurements 180 mg/dl or below.

Complications: 1. Patients with episodes of hyperglycemia. 2. Patients with episodes of hypoglycemia

2.5.1.7 Quality of life

This part includes the variables related to the effect of diabetes on the quality of patient's life; effect of diabetes on patient day life activity, favorable food, skills practices (medication) and socially acceptance.

25.1.8 Quality of services

This part is concerned with patient's satisfaction with the offered services (medical and educational) provided by the clinics and were identified as indicators for quality of services.

2.6 Data analysis

Statistical Package for Social Science (SPSS) was used for data analysis. Calculated values included means and frequencies and Chi-Square was used to determine variation significance.

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CHAPTER III

RESULTS

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3.1 Background information

3.1.1 Demography

The age of participants ranged from 2.40–18 years with mean age of 13.0 years. Out of 100 patients, 90.0% of were school students divided into Basic cycle with 68%, Secondary cycle with 22%, 10.0% were kindergartens with mean of 6.6 years.

Data presented in table 3.1 shows that males and females were equal represented in our population. The mean at age of onset was 4.95 years. It was also found that 20% of patients reported to have first-degree relative with type1 diabetes. Duration of disease ranged from 0.2-13 years with mean of 4.0 years and 97% of the patients with duration of disease of less or equal to 10 years. Mean of age at onset of disease for males was 4.7 years and 5.2 years for females. According to place of residencies 26% of the patients came from cities, 71% were from villages and 3% were residence of refugee camps. With respect to family history among relatives of diabetic patients, 20% reported a first degree family history. The finding of 20% of the study population with family history of diabetes is statistically significant with a $P= 0.005$.

Study population was distributed according to districts as follows: 51% were from Nablus district, 31% from Jenin and 18% were from Tulkarm district. As total number of population for these districts is

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635,349 (Palestinian Center Bureau of Statistics – PCBS, 1998-1999) and total of reported type 1 cases in theses districts was 100, the expected prevalence rate in these districts is around 15/100,000. This is an underestimated number as this study excluded those patients who are registered at UNREWA diabetic clinics.

Table 3.1 Demographic distribution of type 1 diabetes mellitus among study population

			Age group/year		
			1-6yrs	7-16yrs	17-18yrs
Gender	Male		7	34	9
	Female		3	34	13
Residence	City		2	15	9
	Village		8	50	13
	Ref.camp		0	3	0
District	Nablus		7	39	5
	Jenin		3	16	12
	Tulkarm		0	13	5
Age at onset / y	1-6		10	19	2
	7-16		0	49	17
	17-18		0	0	3
Duration of disease	<10 years		10	67	20
	>10 years		--	1	2
Family history	Yes	20%	5	8	7
	No	80%	5	60	15

3.1.2 Access to services

Our findings indicate that 13% of the study population faced difficulties in receiving their medication and other services regularly, while 87% of patients have no interruptions or difficulties in receiving their medications and other services.

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3.1.3 Offered Services

With respect to services offered to diabetic type 1 patients in the diabetic clinics, our findings show that all patients were registered and have access to governmental clinics; however, 11% of them had additional access to other health providing sectors including the private and UNRWA centers. All patients reported to have consultation with diabetologist. The percentages of 54%, 36%, 59%, 67%, 72%, 92%, 84% and 35% were reported to receive consultation with dietitian, health education sessions, education about diabetes, education about complications, education about diet, education about physical activities, instruction about medication skills and home monitoring skills, respectively.

3.1.4 Knowledge

With respect to the knowledge and back ground of the patients about the disease and self care, our data shows that 91% of the study population seems to know how to treat hypoglycemia, 65% of them recognize that testing of blood glucose is the best way for measuring glucose level, 94% were aware about the cause of hyperglycemia, 98% of them are able to recognize the symptoms of hypoglycemia, 97% know how to handle hyperglycemia, 53% of them were aware of the effect of infection on

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diabetes, 84% were aware of diabetic complication and 96% were aware of the importance of physical exercise for their health.

Table 3.2 Relation of patient's knowledge and complications in diabetes type 1

Complication	% of complication associated with diabetes		*P*-value	
	Yes	No	Hyper.	Hypo.
Hyperglycemia	95.2	4.8	0.373	0.743
Hypoglycemia	84.5	15.5		

Data presented on table 3.2 shows that 95.2% and 84.5% of the study population were aware of the complications (hyper and hypoglycemia, respectively) associated with diabetes. No statistical significance between patient's knowledge about complications associate with diabetes and patient's experience about complications of hyperglycemia episodes and hypoglycemia episodes.

3.1.5 Practices

Our findings related to daily practices by patient to empower self-management of the disease showed that 91% of patients seem to follow certain changes in diet regime following diagnosis, 83% reported engagement in physical activity, 59% reported no noticeable change in their social life, 58% of them practiced home monitoring of blood sugar, 6% practiced home monitoring of urine sugar, while 42% of population reported never practiced of home monitoring, 96% of the study

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population never practiced monitoring of ketones in urine, 46% of the patients practice adjustment of insulin dose according to measurement, 99% of patients use certain dietary modification in response to sugar monitoring, 98% of them practices of physical activity according to sugar measurements and only 7% of the study sample have diabetic identification cards.

Data presented in table 3.3 shows the frequencies of various daily practices and their effects on clinical status of the study population with respect to diabetic complications. Out of those who adopted changes in diet regime, 90.6% were hyperglycemic and 90.5% were hypoglycemic. Out of those who followed changes in their physical activities, 82.3% were hyperglycemic and 82.1% were hypoglycemic. With respect to home monitoring of their blood sugar, 57.3% were hyperglycemic and 60.7% were hypoglycemic. With respect to home monitoring of urine blood sugar, 5.5% were hyperglycemic and 6.0% were hypoglycemic. With respect to adjustment to blood sugar level both diet and insulin dose were examined. Our findings indicate that 99% of those followed diet control were hyperglycemic and 98.8% were hypoglycemic. For those who used insulin to adjust blood sugar levels, 45.8% were hyperglycemic and 47.6% were hypoglycemic. Practicing of physical activities and their effect on complications showed that 97.9% were hyperglycemic and 97.6% were hypoglycemic.

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None of the above studied practices seems to show any statistical significance in control of complications associated with diabetes.

Table 3.3 Relation of complications of type 1 diabetes mellitus to patient's practices

Practices		% of Complications		*P*-value	
		Hypergly-cemia	Hypogly-Cemia	Hyper.	Hypo.
Change diet regime	yes	90.6	90.5	0.521	0.675
	no	9.4	9.5		
Change physical activity	yes	82.3	82.1	0.356	0.601
	no	17.7	17.9		
Home monitor blood sugar	yes	57.3	60.7	0.482	0.208
	no	42.7	39.3		
Home monitor urine sugar	yes	5.5	6.0	0.640	0.317
	no	94.8	94.0		
Insulin adjustment /blood sugar level	yes	45.8	47.6	0.870	0.457
	no	54.2	52.4		
Diet adjustment /blood sugar level	yes	99.0	98.8	0.837	0.661
	no	1.0	1.2		
Practice physical activity	yes	97.9	97.6	0.771	0.533
	no	21.0	2.4		

Data presented in table 3.4 shows associations between consultations services and controlled blood sugar among patients. Our data shows that 40.7% of those who attended consultation sessions with dietitian were with controlled fasting blood sugar and 20.3% for those who attended consultation sessions with diabetologist were with controlled fasting blood sugar.

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Our data also indicates that 46.0% of those who attended consultation sessions with dietitian were with controlled random blood sugar and 20.0% for those who attended consultation sessions with diabetologist were with controlled random blood sugar.

Table 3.4 Relation of control (clinical status) of type 1 diabetes patients to clinical services

Clinical Status		% of Consult. Dietitian	% of Consult. diabetologist	*P*-value
		Yes	Yes	
Fasting <140mg/dl	Cont.	40.7	20.3	0.253
	Uncont.	59.3	79.7	
Random <180mg/dl	Cont.	46.0	20.0	------
	Uncont.	54.0	80.0	

Significant at P-value < 0.05

Data presented in table 3.5 shows associations between educational services and controlled blood sugar among patients. Our findings shows that 49.2% of those who attended educational sessions about diabetes were with controlled fasting blood sugar and 23.7% for those who attended educational sessions were with random blood sugar.

Table 3.5 Relation of controlled (clinical status) patients of type 1 diabetes to educational service

Educational services		Fasting sugar <140mg/dl		Random sugar <180mg/dl		*P*-value	
		Con.	Uncont.	Con.	Uncont.	Fast	Random
Received education	Yes	49.2	50.8	23.7	76.3	0.448	0.263

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3.1.6 Clinical status

The findings of fasting blood sugar among study population showed that fasting blood sugar ranged from 59-397 mg/dl with mean of 178 mg/dl. On the other hand random blood sugar ranged from 95-465 mg/dl with mean of 265.2 mg/dl.

Our data shows that 46% of patients were considered to be with controlled fasting blood sugar and 20% of patients were considered to have controlled random blood sugar.

With respect to complications associated with diabetes, 84% of patients have experienced symptoms of hypoglycemia and 96% were reported to experience high blood sugar.

Data presented in table 3.6 shows the relation between clinical status and daily practices. Among those who adopted changes in their diet regime 93.5% were found to have controlled fasting blood sugar and 58% of them were with controlled random blood sugar. For those who engaged in physical activities 87% were found to have controlled fasting blood sugar and 79.6% of them were with controlled random blood sugar. Among those who practiced home blood monitoring 65.2% were found to have controlled fasting blood sugar and 90% of them were with controlled random blood sugar, while those who practice home monitoring of urine sugar 60% were found to have controlled fasting blood sugar and 20% of were with controlled random blood sugar.

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Among those who used insulin to adjust their blood sugar, 45.3% were found to have controlled fasting blood sugar and 45% of them were with controlled random blood sugar, while those used diet as means of adjusting their blood sugar, 10.6% were found to have controlled fasting blood sugar and 100% of them were with controlled random blood sugar. The only observed statistically significant variation with respect to practice was observed for those who used to monitor their blood sugar at home with respect to the controlled random blood sugar ($P = 0.001$).

Table 3.6 Relation of clinical status of type 1 diabetes mellitus to patient's practices

Practices	Clinical status				*P*-value	
	Fasting <140mg/dl		Random <180mg/dl		fasting	random
	%Con.	%Uncon	%Con.	%Uncon.		
Change diet regime	93.5	88.9	58.0	92.5	0.122	0.295
Change physical activity	87.0	79.6	95.0	80.0	0.331	0.110
Home monitor blood sugar	65.2	51.9	90.0	50.0	0.177	0.001
Home monitor urine sugar	60.0	45.3	20.0	20.0	0.519	0.400
Insulin adj. /blood sugar level	45.3	38.9	45.0	37.0	0.122	0.920
Diet adj. /blood sugar level	10.6	98.1	100	98.0	0.354	0.615
Practice physical activity	97.8	98.1	95.0	98.0	0.909	0.284

3.1.7 Quality of life

Table 3.7 shows relation between complications associated with type 1 diabetes (hyper- hypoglycemia) and quality of life of patients. Items

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dealing with patient coping with life were assayed as coping or non-coping patients.

Data presented in the same table shows that among those with hyperglycemia, the ratios of 49%, 18.8% and 82%, were without any effect on their normal life activities, eating habits and social acceptance, respectively.

Among those with hypoglycemia, the ratios of 47.6%, 17% and 85.7%, were without any effect on their normal life activities, eating habits and social acceptance, respectively.

Table 3.7 Relation of complications of diabetes mellitus type1 to QOL

Quality of Life		Complications		*P*-value	
		% Hyperglycemia	% Hypoglycemia	Hyper	Hypo.
Effect on normal activity	Coping	49.0	47.6	0.967	0.527
	Noncop	51.0	58.4		
Effect on favorable food	Coping	18.8	17.0	0.339	0.182
	Noncop	78.0	67.0		
Effect on social acceptance	Coping	82.0	85.7	0.712	0.773
	Noncop	14.0	3.6		

Data presented in table 3.8 show the relation between clinical status and quality of life of patients. Data presented in the same table shows that among those with controlled fasting blood sugar, the ratios of 37%,

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17.4% and 89.1%, were without any effect on their normal life activities, eating habits and social acceptance, respectively.

Among those with controlled random blood sugar, the ratios of 50%, 25% and 90%, were without any effect on their normal life activities, eating habits and social acceptance, respectively.

Table 3.8 Relation of clinical situation of patients of diabetes mellitus type 1 to quality of life

Effect on quality of Life		Clinical status				*P*-value	
		Fasting sugar <140mg/dl		Random sugar <140mg/dl		Fast	Random
		%Con.	%Uncon.	%Con.	%Uncon.		
Normal activity	**Coping**	37.0	59.3	50.0	48.8	0.26	0.920
	Non-cop.	63.0	40.7	50.0	51.3		
Favorable food	**Coping**	17.4	18.5	25.0	16.3	0.88	0.362
	Non-cop.	82.6	81.5	75.0	83.8		
Social acceptance	**Coping**	89.1	83.3	90.0	85.0	0.62	0.693
	Non-cop.	10.9	5.6	10.0	15.1		

3.1.8 Quality of services

These indicators were used to examine the patient's satisfaction with services offered by their clinics. Seventy eight percent of the study population seems to be satisfied by what is offered. Seven percent of them were reported to be not satisfied with the services and the rest had no comments.

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CHAPTER IV
DISCUSSION and CONCLUDING REMARKS

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Since the current study aimed at evaluating available services provided to patients suffering from diabetes type 1, one is expecting the studied population to represent young age group. In our study, the majority (68%) of patients was at age 7-16 years of adolescence (see table 3.1). Thus, confirm previous findings concerning the increased incidence with age of type 1 diabetes which was reported to show an increase with age through childhood and adolescence but decreases during adulthood (National Electronic Library for Health, 2001).

In our population the peak of incidence of type 1 was represented with a mean age of 9.3 years among females and 8.5 years among males, which markedly lower than that reported in USA and other countries (America Associated Diabetes, 1998; Barbara H. Scott, 1997). This might be partially due to variations in feeding habits or environmental factors.

Equal representation of type 1 was observed among males and females in our population (table 3.1). This finding is consistent with worldwide reports in this respect (Report of the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus, 1997; National Diabetes Data Group, 1995).

Demographic structure of Palestinian population divided to three regions: cities, villages, and refugee camps. It would be expected that our sample would represent 26.5% of refugees (Palestinian Central

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Bureau of Statistics, 1998) but UNRWA clinic were dropped from the study as we were mainly aware of provided governmental services.

No clear evidence for the association of genetics and type 1 diabetes however, many reports indicate that family is imposing an important risk factor that links diabetes and genetics. The ADA group reported that type 1 diabetes tends to run in families (Bottazzo G.F., *et al.*, 1997). In our population 20% of patients reported to have first-degree relative with type 1 diabetes, such finding is consistent with that reported by Amy Adams M.S., 2000. It is worth noting that our finding in this respect was statistically significant with a *P* value of 0.005.

The first ten years following diagnosis of diabetes mellitus are important as the cumulative effects of small pathogenic changes are often irreversible and may lead to complications with serious end-effects. These changes may be asymptomatic in the early years thereby giving a false sense of security (Barbara, 1997). In our population 97% of the patients were of ten years and less and mean of 4.0 years of duration of disease this is may be why no complications were observed for eye, kidney or heart.

In our study sample 13% were reported to have problems in getting their insulin dose in time and this was mainly due to difficulties in reaching clinics as a result of the prevailing political situation in the area. This is expected to complicate the health status of these patients and is

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expected to induce complications at earlier stage of life. A WHO report about health conditions in Palestine between September 2000 and May 2002 shows restricted access to health facilities for patients and health care providers, as well as damage to health facilities, has disrupted routine health services and crucial preventive public health programs and services (WHO, 2002).

Our findings with regarding the effectiveness of the provided services (clinical and educational) by the clinical diabetic centers on the control of fasting and random blood sugar seems to indicate that receiving services in the diabetic clinic in the studied centers does not improve patients blood sugar levels (see tables 3.2 and 3.3).

Although patient's answers about knowledge part of the questionnaire shows a high level of knowledge about diabetes. Simply transferring knowledge is not enough to achieve the long- term life style changes necessary for good diabetes management and this is in agreement with Jervell's theory 'know-how' is more appropriate than 'knowledge' (Jervell's, 1996).

The American Diabetes Association provides standards of medical care for people with diabetes. These standards include medical care team providing: Clinical services consist of consultation with GP, consultation with ophthalmologist, consultation with dietitian, trained Nurses with diabetes and continuous education. Such settings is expected to be

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highly costly and is not available in our health service system directed towards this group of patients and this might be one of the reasons behind the absence of any noticeable improvement on the control of blood sugar and control of complications in our study population. It is essential to point out that compliance of patients to instructions regarding medical as well as physical treatment could be another limiting factor for health improvement among this group. Lack of educational background, awareness about the disease by the parents is most likely to affect compliance and hence reflected on the heath of affected patients.

The findings of this study also agree with reports from the Dutch IDDM education program where no significant improvement in metabolic control resulted from improved knowledge. This appears to be due to lacked guidance to integrate the skills into daily life (de Weerdt, *et al.*, 1991).

Home monitoring in combination with other practices concerning self-care could affect the outcome of disease. DCCT study findings showed that lowering blood sugar reduces risk of complications of the eyes, kidneys and nerves (Implications of the diabetes Control and Complications Trial, 1999).

All patients received insulin injection as the only mode of treatment on monthly bases. Insulin does not cure diabetes nor prevent its eventual effect of complications. Insulin is just to allow person to stay alive. 84%

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of population was having hypoglycemia, which is the most common medical emergency for a diabetic childe, in which progression of the case may lead to brain damage or death. 96% of patients had episodes of hyperglycemia in which persistence of it will lead to early appearance of irreversible diabetic complications (data not shown).

Findings in tables 3.4 and 3.5 represent the association between both clinical and educational services and the health status of study population. Neither clinical nor educational services seem to play an effective role in controlling patient's blood sugar. Among those who attended dietitian consultation sessions, 40.7% and 46% have controlled fasting and random blood sugars, respectively. From those who attended diabetologist consultation sessions, 20.3% and 20% have controlled fasting and random blood sugars, respectively. Among those who received education about diabetes, 49.2% and 23.7% have controlled fasting and random blood sugars, respectively. Such findings strongly indicate that none of the studied services seems to improve the health status. Once again it's difficult to explain such low response to such services and whether compliance is behind this observation. Further studies are essential at this stage in order to elucidate the reasons behind such findings.

Daily practices aiming at improving heath status through the control of blood sugar seems to have no noticeable effect in this respect except

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for those who seems to practice home monitoring of glucose blood level, as a statistically significant correlation was observed between monitoring and control of glucose blood level (P=0.001). Such finding is expected as monitoring leads to adjustment which in turn results in controlled blood sugar. It is of great importance to point out that only 58% of the study population monitors their blood level and this low percentage is mainly due to the high cost of home monitoring of glucose level as it requires relatively costly instruments and kits. Studies by ADA, 2001 seems to emphasis the role of glucose self-monitoring in combination with other practices for an effective outcome of disease.

People with diabetes have to make changes in their life styles in order to control their blood sugar level to stay healthy and leading a normal life. Our data indicates diabetic complications affected the normal daily activities of 49% and 47.6% due to hyper and hypoglycemia, respectively (see table 3.7). Hypoglycemic status seems to have more serious consequences on patient's heath and thus reflected on their coping for normal life activities. The finding of around 84% of the study cases with episodes of hypoglycemia is expected to affect normal life activities of such patients. It is also important to point out that such complications seems to influence coping with new diet regimes as the ratios of 18.8% and 17% were able to cope with these changes among those suffering from hyper and hypoglycemia, respectively.

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The influence of controlled and uncontrolled blood sugar (fasting and random) on normal day activity and quality of life is shown in table 3.8. Coping rates for the controlled group was 37% and 50% for fasting and random, respectively. Although, this represent controlled group with respect to their blood sugar, they seem to have very low rate of coping with normal day activities. The reason behind this finding is not clear, however, overall treatment, diet, and clinical status (hypo-hyperglycemia) situation may account partially for such finding. In general one can say that inadequate management and control seems to reduce quality of life.

Comparing the observed relatively high negative outcome of quality of services (54% of patients have uncontrolled fasting blood sugar, 80% with uncontrolled random blood sugar, 84% reported episodes of hyperglycemia, 96% with hypoglycemia), 87% were reported to be satisfied with the offered services. We do believe that the unjustified satisfaction rate by patients and their families is mainly due to the fact that they are getting their medication almost free of charges and this for certain if not the majority of the families is big relief, on the other hand this may reflect lack of knowledge about what is expected from these centers by patients families.

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Recommendations

1. Since our data strongly indicates a negative outcome regarding the effectiveness of diabetic centers on health of patients, it is essential to adopt internationally recognized protocols for diagnosis, treatment and follow up for type 1 diabetic patients that assure controlled blood sugar levels, which will be reflected later on disease complications.

2. Specially designed educational programs targeted to patients and their families are of great importance and this can be achieved through the Ministry of Health.

3. Trained GP's and qualified dietitian should be actively involved in every clinic.

4. Ensure good understanding of the passed information to the children's and their families.

5. Supporting groups are of great importance to patients and their families.

Recommendations for further studies

1. Studies on effect of mother's education upon control of type 1 diabetes disease.

2. The effect of current political situation on type 1 diabetic patients.

3. Studies about prevalence and incidence rates of diabetes type 1 in Palestine.

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جامعة النجاح الوطنية
كلية الدراسات العليا

مرض السكري من نوع 1 في مجتمع شمال فلسطين

إعداد
مجد أسعد أبو علي

إشراف
الدكتور سليمان خليل
الدكتور علي الشعّـار

قدمت هذه الاطروحة استكمالا لمتطلبات درجة الماجستير في الصحة العامة بكلية الدرسات العليا في جامعة النجاح الوطنية في نابلس ، فلسطين 2003

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ملخص الدراسة

هدفت الدراسه الحاليه الى تقييم برامج الخدمات الطبية و المقدمة لمرضى السكري و المعتمدين على الأنسولين (النوع الأول) ومدى استفادة المرضى من هذه الخدمات سواء الطبية منها او التثقيفية و الإرشادية.

شملت الدراسة جميع الأطفال و المسجلين في كل من مراكز السكري في كل مدينة نابلس و جنين و طولكرم ممثلة بذلك غالبية سكان شمال الضفة الغربية.

قد عملت الباحثة على جمع البينات الخاصة بهؤلاء المرضى من مراكزهم وذلك باستخدام استبانة خصصت لهذا الغرض حيث شملت الاستبانة على اسئلة تتعلق بالوضع الصحي للمرضى و كذلك معلومات ديموغرافية وحاولت ربط مدى تؤثر الوضع الصحي بالخدمات المقدمة. وقد تم تحليل البيانت باستخدام البرنامج الأحصائي (SPSS).

تشير نتائج هذه الدراسة الى أن نسبة الاصابة كانت متساوية عند الذكور و الاناث وكانت موزعة في المحافظات المذكورة على النحو التالي: 51 حالة نابلس ، 31 حالة في منطقة جنين، 18 حالة في طولكرم، و كان متوسط الاعمار لظهور المرض لدى الاطفال 4.95 سنة.

و تبين كذلك ان 20% من الحالات لديهم اقارب يعانون من نفس المرض، وقد لوحظ كذلك وجود مضاعفات مرضية متعلقة بنوبات ارتفاع نسبة السكر بالدم لدى 96% من الحالات في حين عانى 84% من الحالات من انخفاض نسبة السكر بالدم.

اما في ما يتعلق بالممارسات اليومية مثل، الوجبات الغذائية الخاصة والانشطة الرياضية و كذلك اتباع المراقبة البيتية لنسبة السكر في الدم والبول و كذلك استخدام كل من الانسولين و الحمية الغذائية لمعالجة ارتفاع نسبة السكر في الدم و اثرها على الوضع الصحي و تعقيدات ارتفاع و هبوط السكر في الدم فلم يلاحظ اي علاقة ذات قيمة احصائية حيث لم تبين اي من الممارسات المذكوره اية نواحي ايجابية للتقليل من اعراض السكري و ضبط نسبة السكر في الدم.

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كما بينت الدراسة اثر و دور كل من المرشد الغذائي و الطبي الاخصائي بمرض السكري على ضبط نسبة السكر في الدم حيث لم يلاحظ وجود اي فروقات ذات قيم احصائية هامة لصالح احداث تقدم في الوضع الصحي لدى المرضى. وتبين كذلك ان البرامج التعليمية و الموجهة و الخاصة بهذا المرض لم يكن لها اي اثر في الحد من او ضبط نسبة السكري في الدم، كما تبين ان الممارسات سابقة الذكر و التي يتبعها المرضى ضمن توجيهات هذه البرامج لم يكن لها اثر ايجابي و الوضع الصحي للمرضى ، و ان الممارسة الوحيدة و التي اثبتت جدواها في الحد او التقليل من نسبة السكر في الدم المتعلقة بالمراقبة البيتية لنسبة السكر في الدم.

ان مثل هذه النتيجة هي نتيجة متوقعة وحتمية حيث من المتوقع ان يتبع المراقبة البيتية ضبط نسبة السكري من خلال اما جرعا ت دوائية او التحكم بالحمية الغذائية.

وقد تناولت الدراسة كذلك اثر الوضع الصحي للمرضى و نوعية الحياة و التي تتضمن مدى قدرت المرضى على التكيف و العيش و ممارسة الحياة الطبيعية و كذلك التكيف مع نظام الحمية الغذائية و كذلك اثرها على اندماجهم في المجتمع و اظهرت النتائج تدني في نسبة التكيف لدى المرضى و استعداداتهم لممارسة الحياة الطليعية. .حيث لم تتجاوز نسبة القادرين على التكيف مع متطلبات الحياة العادية ال 50% .

وقد ابدى 87% من المرضى على الرغم من عدم وجود مؤشرات دالة و ذات قيم احصائية هامة عن الرضى من اداء هذه المراكز و مستوى الخدمات المقدمة. ان التفسير الممكن لهذه الظاهرة من الرضى هو ان هذه المراكز التي تقوم بتقديم العلاج مجاناً و الذي من الصعب على الكثير من ذوي المصابين توفيره.

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