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Nutritional Assessment for Type II Diabetes mellitus in Dheisheh refugee Camp – Bethlehem District

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Declaration

I certify that this thesis submitted for the degree of master in Public Health, is the result of my own research, except where otherwise acknowledges, and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

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Abstract

Diabetes is one of the main health problems in the Palestinian society that is demonstrating an increased pattern due to different factors determining the occurrence of the disease. Its prevalence rate was about 9% in 2000, and the estimated prevalence rate among refugees was 4.7% in 2001. To date there are very limited numbers about nutritional diabetes in Palestine, and none of them were concerned with the food content consumed by these patients. Therefore, this study aims to assess nutritional status and food content for type 2 diabetes patients residing at Dheisheh Refugee Camp in Bethlehem district.

A cross-sectional design has been used. Our study sample was based on the list prepared by Ibdaa Diabetic Club which was based on the UNRWA registry. Accordingly, 154 type 2 patients fit with this study inclusion-exclusion criteria, though, 104 participated in this study. An Interview questionnaire and food frequency questionnaire (FFQ) were used to collect the need information. Weight and height measurements and the blood testing for HbA1c were done as objective tests for this study.

Results show that 30.8% of the study population were males (n=32) and 69.2% were females (n=72). The mean age was 54.6 years (SD 8.45).While the duration of diabetes illness varied between 1-27 years with an average of 7.5 years (SD 5.48). The mean level of HbA1c in this study was 8.27 (SD ±1.62, range 5.30-13.2).Of the study population 83.7 % (n=87) underwent HbA1c testing. A significant positive association was found between the frequency of nutritional advice with HbA1c ($P<0.05$).

Data showed that the mean consumption of carbohydrate was 231.6 g/day, 42.7 g/day fat, 52.7 g/d protein, and the average caloric intake of 1488 Kcal/day. None of the linear regression between total CHO, fat, protein, and caloric intake with HbA1c showed a significant association. Also, the t-test showed no significant difference in the means between these intakes and HbA1c categories.

Finally, the logistic regression model for HbA1C, in adjusting for age, gender, dependents number, disease duration , body mass index , none of the nutritional intakes per day, i.e. total CHO, fat, protein, and total caloric intake tertiles showed any significant adjusted odds ratios.

Study results show that there was no significant difference in food consumption between patients with HbA1c > or HbA1c $\leq$7. Setting up professional education programs and a national program for nutrition of Type 2 diabetes by using more advanced research methodology such as cohort or case-control designs might be more informative of some missing information needed for controlling diabetic patients' glycemia.

ملخص الدراسة

يعتبر مرض السكري من اهم المشاكل الصحية التي تواجهة المجتمع الفلسطيني في الوقت الحاضر, و لاسباب متعددة يظهر هدا المرض اعداد متزايدة من الحالات في المجتمع الفلسطيني. في عام 2000 كانت نسبة حدوثة في المجتمع الفلسطيني هي9%، في حين كانت في عام 2001 4.7% بين اللاجئين الفلسطينيين.لذلك هدفت هده الدراسة الى وصف الوضع الغدائي لمرضى السكري – النوع الثاني – في مخيم الدهيشة للاجئين في محافظة بيت لحم.

أجريت دراسة وصفية مقطعية في العام 2007، اختيرت عينة هدة الدراسة بالاعتماد على سجلات نادي ابداع لمرضى السكري في مخيم الدهيشة و التي بنيت على سجلات المرضى المسجلين في عيادة الوكالة بمخيم الدهيشة. و بهدا كان هناك 154 مريض سكري النوع الثاني قد انطبقت عليهم شروط الدراسة , 104 مريض شاركوا في هدة الدراسة.

تم استخدام الاستمارة كاداة لجمع المعلومات, شملت المعلومات الاجتماعية الخاصة بالمرضى,التاريخ المرضي,العلاجات المستخدمة, التاريخ الغذائي, بالاضافة الىانواع وكميات الاطعمة التي يتناولها المرضى ودلك باستخدام استمارة التكرار الغدائي . كماستخدم مقياس الطول والوزن بالاضافة الى فحص السكري التراكمي في هده الدراسة.اظهرت نتائج هدة الدراسة ان متوسط اعمار المرضى كان 54.6 عاما (انحراف معياري 8.45) ، 31% منهم في الفئه العمرية بين 50-59 سنة. منهم 30.8% دكور وعددهم32 , و منهم ما نسبتة 69.2 اناث و عددهن 72،يعانون من مرض السكري بمدد تتراوح من

سنة الى 27 سنة بمتوسط 7.5 عاما(انحراف معياري 5.48) و فقط ما نسبته 83.7 من عينة الدراسة عملوا فحص السكري التراكمي، وكانت ما نسبته 25.3 من النتائج أقل من 7.

بينت الحسابات بأن متوسط فحص السكر التراكمي للمرضى في مخيم الدهيشة هو 8.27 (انحراف معياري 1.62) ، بمدى يتراوح بين (5.30_13.2). و بينت الدراسة ايضا ان % 83.7 من المرضى الذين اشتركوا في الدراسة قد عملوا فحص السكر التراكمي و عددهم 87, منهم 25.3% فقط اقل من7 وعددهم22. بينت النتائج بأن استهلاك الكربوهيدرات يتوزع حول الوسط الحسابي 231.9غم / يوم، و42.7 غم / يوم للدهون,52.7 غم /يوم للبروتينات، في حين كان1488سعرحراري/ يوم للسعرات الحرارية

في هذه الدراسة بينت كل المعادلات الخطية بين الكربوهيدرات، البروتين، الدهون، و السعرات الحرارية مع فحص السكر التراكمي عدم وجود علاقة ايجابية، وقد اوجدت نتيجة مماثلة عند مقارنة الثلث العلوي مع الثلث السفلي لمجموع الكربوهيدرات ولمجموع البروتين ولمجموع الدهون ولمجموع السعرات الحرارية المستهلكة في اليوم من قبل المرضى بمستويات فحص السكر التراكمي الاكثر والاقل من 7. كماأوجد فحص العامل المستقل(t-test) بأنه لا توجدعلاقة بين العوامل السابقة ومستوى فحص السكر التراكمي.

أظهرت النتائج بأنه لا يوجد هناك اختلاف بين المرضى ذوي فحص السكر التراكمي الأكثر من 7 أو أقل من 7. ربما رجع ذلك الى حجم العينة الصغير نسبيا (87) التي شاركت في الدراسة. أو ربما رجع ذلك

الى الحاجة لاستخدام وسيلة اخرى لجمع المعلومات غير استمارة التكرار الغذائي و التي استخدمت في هذة الدراسة.

هذة الدراسة تظهر الحاجة الى برنامج تعليمي و برنامج وطني بما يخص الغذاء و مرض السكري. كما تبين الحاجة الى تفعيل البروتوكولات العلاجية الخاصة بمرض السكري في فلسطين و تشكيل هيئة وطنية لمتابعة هذا الموضوع.وكباحثة اوصي بدراسة تبحث المكونات الغذائية لمرضى السكري في فلسطين, وذلك باستخدام طرق بحثية ملائمة و اكثر دقة.

Chapter One

Introduction

1.1 Background

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1.1 Background

Diabetes mellitus is a complex, heterogeneous, and a metabolic disease that is characterized by abnormal blood glucose" Sugar" concentration (WHO, 1991). This increase of blood sugar concentration is though to result from reduction in insulin secretion in the pancreas or reduced sensitivity to insulin in the peripheral tissues (WHO, 1994). Therefore, two major types of diabetes are recognized. The first type is diabetes type 1 (Insulin Dependent Diabetes Mellitus, IDDM) which is characterized by severe reduction of insulin secretion that is due to destruction of the mass of beta cells responsible for insulin secretion in the pancreas. The second type is diabetes mellitus type 2 (Non Insulin dependent Diabetes Mellitus, NIDDM) which appears at older age than type 1 diabetes and represents 85% of diabetes (WHO, 1991).

The onset and progress of diabetes type 2 is less acute compared to diabetes type 1 and its developments of complications are less aggressive. Type 2 developments complications are mainly due to insulin resistant in the muscle tissue and consequently increase insulin secretion (haffiner, 1996). However, the management of diabetes type 2 believes to be possible depending on life style changes through diet and exercise (Nelson, 2002).

1.2 Study problem:

Diabetes is considered as growing and threatening health problem for the whole world (Zimmet& lefevre, 1966). The prevalence and incidence of diabetes varies across racial/ ethnic classification as they are currently constituted, for example the prevalence among black have been found 1: 5 times that among white (Harris 1991, Roseman, 1985, wetterhall et al, 1992).

The prevalence of diabetes in Western life-style countries is estimated to be between 6-7% (Albarran et al. 2006).In some developing countries the prevalence is more than 6% (Middle East, Western Pacific) (Bacchus et al.1982).Between 1995 and 2025, it is predicted to be a 35% increase in the worldwide prevalence of diabetes. The rising number of people with diabetes will occur mainly in populations of developing countries, leading to more than 300 million people with diabetes worldwide by 2025 (see table 1) (WHO, 2002).

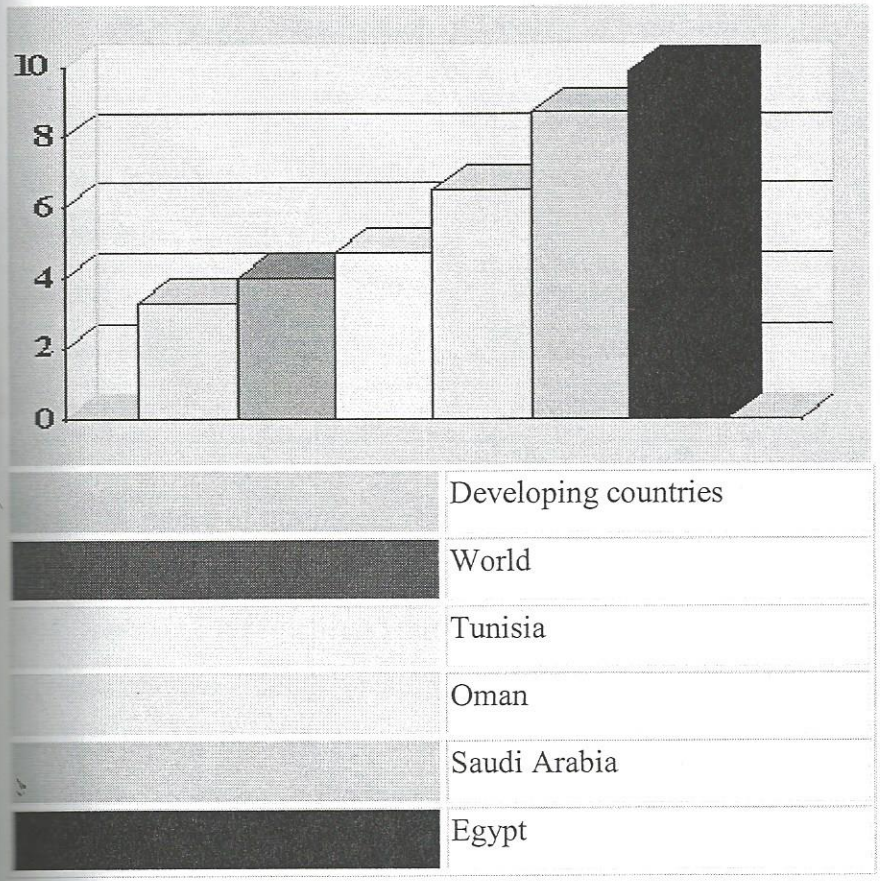
Table (1.1): Prevalence (%) and number of cases of Diabetes type two in million.

	1995	2000	2025
World	135.3(4%)	154.4(4.2%)	300(5.4)
Developed countries	51(5.9%)	54.8(6.2%)	72.2(7.6%)
Developing countries	84.3(3.3%)	99.6(3.5%)	227.7(4.9%)

King et al, Diabetes Care 1998, 21:1414-31

Hilary King et al provided estimates on diabetes prevalence for the years, 1995, 2000, and 2025 for people aged 20 years and above, using previous studies and the United Nations population estimates and projections. Some estimates for the Arab countries are shown and they clearly indicate the magnitude of the problem (see table 2) (King, 1993).

Figure (1.1): Prevalence Estimates of Diabetes in selected Arab Countries > 20 Years in the year 2025:



Source adapted from: King et al, Diabetes Care, 1993

Globally, changes in human behaviour and lifestyle over the last century have resulted in a dramatic increase in the incidence of diabetes, the epidemic is chiefly of type 2 diabetes and the associated conditions known as 'diabesity' and 'metabolic syndrome'. In conjunction with genetic susceptibility, type 2 diabetes is brought on by environmental and behavioural factors such as a sedentary lifestyle, overly rich nutrition and obesity (James,2001).

Rates of type 2 diabetes have increased within the last decades. This is due largely to the global epidemic of obesity, a major risk factor for developing type 2 diabetes. Development of obesity is related mainly to decreased physical activity and increased caloric intake, besides genetic background which determines the tendency to obesity (Coppack, 1998). Prevalence rates for overweight and obese people vary according to region, but obesity now associated with poverty even in low-income countries and burden of disease worldwide, and this turns obesity issue in a matter of concern for World Health Organization (WHO) and

urges it to issue consensus definition of different degrees of overweight and obesity in adults in 2000(Coppack, 1998) (see table 2).

Table (1.2): WHO classification of Obesity in terms of BMI (kg/m2)

Underweight	<18.5	Low (but risk of other clinical problems
Normal Range	18.5-24.9	Average
Overweight	≥ 25	
Pre-obese	25.0-29.9	Increases
Obese class 1	30.0-34.9	Moderate
Obese class 2	35.0-39.9	Severe
Obese class 3	≥	Very sever

The importance of nutritional recommendations for subjects with diabetes has been known as major issue in treatment of the disease. The target of dietary recommendations is prevention and treatment of diabetes through improving glycemic control and lipid profile and optimizing the blood pressure, as high risk of micro vascular abnormalities and cardiovascular diseases in diabetic subjects is linked to increased postprandial glucose response. However, adhering to dietary recommendation is not an easy task as dietary patterns differ greatly (Sudha, 2004).

1.3 Study justification

Diabetes is main health problem in the Palestinian society that is demonstrating an increased pattern due to different factors determining the occurrence of the disease. Dietary change, physical inactivity, stress, and genetic factors are thought to affect the increase in the incidence of diabetes in Palestine (shaar, 1998). In Palestine diabetes type 2 prevalence rate is about 9% in 2006. By the end of 2003, there were 15,844 diabetic Palestinian refugee patients (including those with hypertension) under supervision of UNRWA in Gaza Strip. The estimated prevalence rate of diabetes mellitus among Palestinian refugees aged 40 years and above was 4.3% in 2000 and 4.7% in 2001. The gap between the expected prevalence rates and cases under supervision requires special efforts to accelerate early case-finding activities in order to detect these diseases and meet the high cost of treating their complications and disabling consequences (MOH reports, 2003). In the West Bank, the distribution of incidence rate of type diabetes by age group shows that the peak onset started

since the age of 25-34 years at the rate of 43.1 per 100,000 to reach 1,310 per 100,000 among the age group of 55-64 years and 1,335 per 100,000 at the age of 65 years and over (MOH reports, 2003).

Palestinian community is living in transitional epidemiological stage which is characterized by changing of disease trends from communicable to non communicable diseases. The existence of high prevalence of modernization risk factors like obesity which is found to be 36.8% among women in rural Palestinian area and 49.1% in an urban area. While the percentage was among men in rural areas 18.1% and 30.6% in an Urban areas respectively (see table 3).

Table (1.3): Prevalence of Obesity, BMI> 30 by sex in a rural and an urban Palestinian community:

	Women	**Men**
Rural area	36.8%	18.1%
Urban area	49.1%	30.6%

Source:Abdul-Rahim et al, international Journal of Obesity 2003

Furthermore, the high prevalence of smoking, which approved by literatures to be another risk factor for type 2 diabetes, results according to Palestinian Central Bureau of statistics 2001, find that the prevalence of smoking among those older than 12 years in west bank was 43.3% in males and 4.3% in females. While in Gaza strip the prevalence rate was 35.8% in male and 1.2%. in female (Palestinian Central Bureau of Statistics, 2005).

In Palestine several studies was carried out but not all was published. These studies were concerned with diabetes type 2 treatments, management, complications, causes and sign and symptoms . Some local studies were concerned with diabetes type 2 patient's self-management. A study by Jilleh (Jilleh, 2002) showed clear weakness in self care management for diabetes mellitus on patient level. Anther study was conducted by community center, Birzeit University in 2002 to study constrains which face dealing with diabetic patients at crisis.Their results showed that reaching service centers and poor self-management are the main problems facing diabetic patients and health care providers who work within Palestine (Birzeit University,2002).Another study in Dheisheh refugee camp in 2005, on 162 diabetic

patients receiving their treatments in UNRWA clinic, studied the quality of services and types of self-care techniques, showed that 100% of patients have one or more (DM) complications; the most was Hypertension(HTN) with 51.6% and then eye problems with 48.4% (Ibdaa Center,2005).None of studies above aim to evaluate nutritional lifestyle for type 2 diabetes and it is position in disease prevention or treatment.

1.4 Study area

Dheisheh refugee camp is located in Bethlehem district. It is one of three refugee camps with 13,967 residents living there. It lies 850m above sea level, and far away 2.5 km to the west of Bethlehem city, surrounded by Beit Jala lands, Irtas village, Adoha, and Bethlehem city. Dheisheh is one of fifty-nine Palestinian refugee camps dispersed throughout the West Bank, Gaza Strip, Jordan, Lebanon, and Syria. Dheisheh refugee camp built on less than one square kilometer of land. The camp population was 9,680 individuals in 2007 (Palestinian Central Bureau of Statistics, 2005). There are two resourced schools and one part time doctor who serve the needs of the entire camp. Medical services (treatment and follow up), social services and education at Dheisheh camp, as any other Palestinian refugee camp, is run by UNRWA. Other non-governmental organization provides some other health services, which is not provided by the UNRWA focusing on primary level of prevention such as health and physical education. In addition, there are some medical centers working part time in the camp providing emergency treatments for camp residents who experience an urgent health situation or trauma in evening period of the day, other wise at this time patient has to go to any hospital or medical center outside the camp. Ibdaa Center, a non-governmental organization, provides primary level health services mainly for diabetic patients such as education programs through Ibdaa Diabetic Club which provides counseling in related topics, that also in addition for physical programs and medical follow up, beside to services for ophthalmic patients who receive weekly medical follow up and glasses which given for whom in need, and mental health counseling (UNRWA annual report, 2005).

1.5 Study aim:

This study aim to assess the nutritional status and content of diabetes type 2 patients residing in Dheisheh Refugee Camp in Bethlehem district.

1.6 Study objectives

1- To assess diabetes type 2 patients' disease history in association to their diet intake.
2- To assess patient's perception for identified food items.
3- To assess the glycemic control among these patients and its association to their diet regimes.

1.7 Study limitations

Several limitations rose in this study mainly since it was a cross sectional study, these limitations were:

A. Generalization problems: the study was done on a specific type of population, i.e. refugees, so the study results may not be applicable to others living outside the refugee camps
B. Bias: there are two kinds of bias may limit this study:

- Recall bias since the age of study sample from 40-75 years, and diet has to take long time to be noticed as a factor in patients life, so many people were not aware for what they eat and when ,that may affect their ability to remember especially when asking questions about frequent diet in last year.
- Volunteers' Bias that rise from the awareness of patients for study objectives, which leads to have answers depends on patients view not on the reality for some study questions.

C. Lost of some people location: many diabetic patients change their address or leaving the Camp prior to the survey.

1.8 Expected result and information of this study

Based on the results and outcomes of the study, we expect to assess the nutritional content of the diabetic patients residing at the refugee camp. This is supposed to highlight if there is a relationship between these regimes and the progress in those diabetic patients complications.

This information is aimed to be of use on both levels; policy makers and community level. Regarding the first one it will help policy makers in setting their priorities regarding the