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Evaluation of the Health Education Program for Diabetic Patients at UNRWA Clinics in the Northern West Bank

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إقرار

أنا الموقعة أدناه، مقدمة الرسالة التي تحمل عنوان:

تقييم برنامج التثقيف الصحي لمرضى السكري في عيادات وكالة غوث وتشغيل اللاجئين (الأونروا) في شمال الضفة الغربية

Evaluation of the Health Education Program for Diabetic Patients at UNRWA Clinics in the Northern West Bank

أقر بأن ما اشتملت عليه هذه الرسالة هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وإن هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل أية درجة أو لقب علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the research's own work, and has not been submitted elsewhere for any other degree or qualification.

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List of Acronyms

ADA	American Diabetes Association
BG	Blood glucose
BMI	Body Mass Index
BP	Blood pressure
CDC	The Centres for Disease Control and Prevention
DEP	Diabetes Education Program
DM	Diabetes Mellitus
DSME	Diabetes self-management education
EU	European Union
FGDs	Focus group discussions
GDM	Gestational Diabetes
HbA1c	Haemoglobin (A1c)
HCWs	Health care workers
HDL	High-density lipoprotein
HTN	Hypertension
IDF	International Diabetes Federation
IFG	Impaired fasting glycaemia
IGT	Impaired Glucose Tolerance
JFO	Juzour Foundation for Social Development
KAP	Knowledge, attitude and practice
LDL	Low density lipoprotein
PRECEDE	Predisposing, Reinforcing, Enabling, Causes in Educational Diagnosis and Evaluation
MY-DEMO	Malaysian Diabetes Education Module
NDEP	National Diabetes Education Program
NIH	The National Institute of Health
oPt	occupied Palestinian territory
PA	Physical activity
PPBG	Post prandial blood glucose
UNRWA	United Nations Relief and Works Agency
WC	Waist circumference
WDF	World Diabetes Foundation
WFP	World Food Program
WHO	World Health Organization

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Abstract

Background: Diabetes and associated complications constitute a major health problem in Palestine where their rates are highest among the refugees populationthat is extremely vulnerable. Patient education has been considered an important part of the clinical management of diabetes which has been shown to be effective in improving metabolic control and reducing complications.Therefore, UNRWA launched a six-month pilot campaign, entitled “Life is Sweeter with Less Sugar”, to improve self - diabetic care among Palestine refugees.

Objective: This study aims to evaluate the effectiveness of the diabetes education programapplied at UNRWA clinics in the North West Bank in addition to assessing the reasons for non-attendance of the program and the difficulties during its implementation.

Methodology: The study was both quantitative and qualitative in nature. Pre and post UNRWA surveys were used to assess biometric measurements, physical activity and dietary behaviors of the participants. An interviewer-administered KAP questionnaire was used to assess participants’ knowledge at the end of program. In addition, 120diabetic

patients who didn’t participate in the program were selected and evaluated on the reasons for not attending the program. Qualitative data were collected from focus group discussions with participants and health care workers to assess their opinions about the program.

Result: A significant improvement was revealed in participants’ knowledgeabout diabetes self-management behaviorswith lowering of their mean levels of weight, body mass index,waist circumference, and blood sugar, whereas no significant changes were observed in total cholesterol and blood pressure. Attitudes and practices toward eating behavior and physical activity in participants were improved significantly at the end of the program. The qualitative results also showed that almost all participants appeared to have been satisfied with this comprehensive program in which almost all their needs were met. This was not without challenges where the participants and HCWs reported lack of designated spaces for exercise and cooking sessions as the main challenge.The interviews with HCWs revealed that the lack of enough cadres, time andcommitment from other partners and volunteers were the main difficultites reported by almost all of them. Lack of advertising for the program was identified as the main reason for non-attendance of the program.

Conclusion: This study demonstrates that the UNRWA campaign was effective inimproving knowledge and diabetes self-management behaviors of the participants and reinforces the need for implementing similar education programs as an essential part of diabetes management. Long-term follow-up sessions are recommended to enhance the effectiveness of the program.

Chapter One

Introduction

1.1 Background

1.2 Definition of diabetes

1.3 Self-management of diabetes

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Chapter One

Introduction

1.1 Background

Diabetes is one of the most frequently occurring chronic diseases in the world [1]. Regardless of the degree of development of a country, diabetes mellitus (DM) is an important and growing global public health problem[2]. Long-term complications represented by cardiovascular diseases, cerebrovascular accidents, end-stage renal disease, retinopathy and neuropathies are already major causes of morbidity and premature death among diabetic patients[1]. According to the World Health Organization (WHO), in 2004, an estimated 3.4 million people died from consequences of fasting high blood sugar. A similar number of deaths has been estimated for 2010. More than 80% of diabetes deaths occur in low- and middle-income countries [2].

1.2 Definition of diabetes

Diabetes mellitus is a group of chronic diseases that is both irreversible and progressive, characterized by hyperglycemia[3]. Diabetes was defined by WHO as a “metabolic disorder of multiple aetiology characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both” [3].

1.2.1 Types of diabetes

There are various types of diabetes. The most well-known types are type I and type II diabetes. There are other less common forms of diabetes such as gestational diabetes and other rarer causes (genetic syndromes, acquired processes such as pancreatitis, diseases such as cystic fibrosis, exposure to certain drugs, viruses, and unknown causes) that comprise a small percent of the population with diabetes [4].

Type I diabetes is an auto-immune disease where the body's defence system attacks and destroys the beta- cells in the pancreas that produce insulin, which leads to absolute deficiency in insuline secretions. This type may affect people of any age, but usually develops in children or young adults. People with this form of diabetes need injections of insulin every day in order to control the levels of glucose in their blood [5].

Type II diabetes is often called non-insulin dependent diabetes and it is the most common form, which accounts for at least 90% of all cases of diabetes**.** It is characterized by insulin resistance and relative insulin deficiency. People with type II diabetes can often initially manage their condition through exercise and diet. However, over time most people will require oral drugs and or insulin [5].

1.2.2 Diagnosis of diabetes

Diabetes is a metabolic disease that is diagnosed on the basis of sustained high concentration of glucose in the blood. Impaired Glucose Tolerance (IGT) and impaired fasting glycaemia (IFG) are pre-diabetes states of hyperglycemia that are associated with insulin resistance [6]. IGT is defined according to WHO and ADA as a two-hour glucose level of 7.8 mmol to 11.0 mmol (140 to 199 mg/dL) on the 75-g oral glucose tolerance test without medication [6]. While IFG is defined as a fasting blood glucose (BG) level of 6.1mmol/l to 6.9mmol/L (109.8 to 124.2 mg/dL) without medication [6]. Diabetic patients usually have no symptoms and are diagnosed because a test is done upon patient request or because the patient falls into a high risk category. According to the WHO, the current diagnostic criteria for diabetes are plasma glucose concentration measured after an overnight fast above 7.0mmol/l (126 mg/dL) and/or plasma glucose concentration measured two hours after a 75g oral glucose load above 11.0mmol/l (200mg/dL) on two separate days [4].

1.2.3 Prevalance of diabetes

During the last decades, the world has seen a dramatic increase in the prevalence of diabetes. This chronic disease affects not only the health of people living with it, but also imposes significant direct and indirect costs on them, on their families and on the whole society [7].

Diabetes prevelance globally

The recent figures released by the International Diabetes Federation (IDF) are alarming. In 2011, according to IDF estimates; about 8.3% of adults have diabetes. Most of them (80%) live in low- and middle-income countries. By 2030, if these trends continue, about 552 million people will have diabetes. This equates to approximately 3 new cases every 10 seconds, or almost 10 million per year [5].

Diabetes prevalence in the Arab Region

A rising trend of incidence and prevalence of diabetes is seen in every country around the world. However, the Arab region appears to have a higher prevalence of diabetes than the global average. The Middle East and North Africa region has the highest prevalence of diabetes. Six of the top ten countries with the highest prevalence of diabetes are in the Arab region which are Kuwait (21.1%), Lebanon (20.2%), Qatar (20.2%), Saudi Arabia (20.0%), Bahrain (19.9%) and the United Arab Emirates (19.2%) [7].

Diabetes in Palestine

Diabetes and associated complications constitute a major health problem in the Occupied Palestinian Territories (oPt). In 2000, based on Ministry of Health statistics, the prevalence of diabetes was 9% among adults 30 years and above. Based on UNRWA statistics, the prevalence of diabetes was 10.5% among adults 40 years and above (7.2% among those

40-49, 19.1% among those 50-59, and 24.8% among people 60 and above) [8]. By mid-2011, there were 1,643 new cases of diabetes diagnosed in Ministry of Health Primary Health Care Clinics [9].

1.2.4 Risk factors for diabetes

For type I diabetes, having a family member with type I diabetes slightly increases the risk of developing the disease. Environmental factors and exposure to some viral infections have also been linked to the risk of developing type I diabetes [5]. The risk factors associated with type II diabetes can be grouped into two categories: modifiable and non-modifiable risk factors [10]. Modifiable risk factors include diets rich in saturated fats and simple carbohydrates, IGT, metabolic syndrome, high blood pressure (BP), smoking, elevated plasma triglycerides, and low levels of physical activity (PA) (<3 times a week); while the non-modifiable risk factors are age, family history of diabetes, ethnicity, and diabetes during a previous pregnancy [4,10]. Type II diabetes is more common in people who: are overwieght or obese [a BMI >25 kg/m2)]; have high BP measuring 140/90 mmHg or higher; have abnormal cholesterol with HDL ("good") cholesterol 35 mg/dL or lower, or a triglyceride level of 250 mg/dL or higher [11]. Another risk factor which could increase the likelihood of developing diabetes isbeingabove 45 years old[4].

In the Arab region, several socioeconomic, dietary, and lifestyle factors are associated with type II diabetes [10].The rapid economic development in these countries has resulted in significant changes in socioeconomic status and lifestyle. In Saudi Arabia, 25.5% of the urban population is diabetic in comparison with 19.5% in rural areas [10]. A study of 3,003 diabetic patients in Kuwait reported that 58% of subjects with IGT were physically inactive compared to 4% who were vigorously active; likewise, only 2% of Egyptian adults exercise daily [10].

In the oPt, physical inactivity and poor diet are potentially modifiable risk factors for chronic diseases.The association between poor nutrition and risk of chronic diseases late in life is more complex in the oPt than in developed countries because Palestinian society is in the stage of nutrition transition[8].The prevalence of risk factors among UNRWA diabetic patients is unacceptable, with 11.4% of the population over 40 years old; 90% obese or overweight, and 20 % smokers [12]. Compared with similar populations around the world, this rate is dangerously high. In a study conducted by UNRWA aimed at identifying risk factors of hyperglycemia and hypertension (HTN) among Palestinian refugees, the results showed that being older than 40 years, obese or with a positive family history of diabetes or cardiovascular disease increased the risk of havingHTN and/or hyperglycaemia 3.5, 1.6 and 1.2 times respectively[13].

1.2.5 Long-term complications of diabetes

Diabetes is one of the major causes of premature illness and death in most countries [5]. Generally, the injurious effects of hyperglycemia are separated into macrovascular and microvascular complications[3]. In almost all high-income countries, diabetes is a leading cause of cardiovascular disease, blindness, kidney failure, and lower limb amputation [5].

Diabetic retinopathy is a leading cause of visual disability and it is caused by small blood vessel damage to the back layer of the eye (the retina) leading to progressive loss of vision and with no intervention, blindess may occur [3,4].

Diabetic nephropathy is caused by damage to small blood vessels in the kidneys [4]. It is defined by proteinuria above 500 mg in 24 hours in the setting of diabetes, but this is preceded by lower degrees of proteinuria, or microalbuminuria [3]. In developed countries, this is a leading cause of dialysis and kidney transplant [4].

Diabetic neuropathy is recognized by the ADA as “the presence of symptoms and/or signs of peripheral nerve dysfunction in people with diabetes after the exclusion of other causes”[3]. This nerve damage can lead to sensory loss, damage to limbs, and impotence in diabetic men. It is the most common complication of diabetes [4]. About half of all people with diabetes have some form of nerve damage [14].

In macrovascular complications of diabetes, the central pathological mechanism is the process of atherosclerosis, which leads to narrowing of arterial walls throughout the body [3,4]. Cardiovascular disease, resulting from damage to large blood vessels, causes the death of 50% or more of people with diabetes depending on the population [5].

1.2.6 Morbidity and mortality associated with diabetes

Morbidity

Diabetes is one of the most common chronic diseases in the world; over time, diabetes can damage the heart, blood vessels, eyes, kidneys, and nerves [2]. The risk of lower limb amputation is increased up to 15 fold in people with diabetes [15]. In 2010 in the United States, about 60% of non-traumatic lower-limb amputations among people aged 20 years or older occured in people with diagnosed diabetes [14]. Also, in the United States, DM is the leading cause of end stage renal disease and kidney failure which accounts for approximately 40% of all new cases [15]. Diabetic retinopathy is estimated to be the most frequent cause of new cases of blindness in the United States among adults aged 20–74 years [14]. ADA showed that 28.5 % of adults with diabetes aged 40 years or older had diabetic retinopathy in 2008 [13].

Among Saudi patients, there is a 31% prevalence of retinopathy in patients whohad type II diabetes for at least 10 years; while about 37–41% of diabetic patients develop a stroke and 61% of them have peripheral

artery disease [15]. In Jordan, 45% of diabetic patients at a national diabetes center had retinopathy, 33% had nephropathy, and 5% had amputations [10].

A study conducted in Egypt using cross-sectional design aimed to describe glycaemic control and the prevalence of microvascular and neuropathic complications among Egyptians with diagnosed diabetes. The results showed that 42% of diabetic patients had nephropathy, 22% had peripheral neuropathy, 0.8% had foot ulcers, and 5% were blind [16].

In the oPt, although diabetes mellitus and its complications are major health problems in the territory according to all estimates[8], there is a lack of reliable data on its complications. Fortunately; recently a study of diabetes mellitus complications was conducted in Ramallah governorate clinics aimed at estimating the prevalence of diabetes mellitus complicationsand self-management behaviours [17], but the results are not released yet.

Mortality

Diabetes complications are frequently the cause of death in people with diabetes [5]. The overall risk of dying among people with diabetes is at least double the risk of their peers without diabetes [2]. In 2004, an estimated 3.4 million people died from consequences of high fasting BG according to WHO statistics [2]. Recent statistics according to IDF estimate that approximately four million deaths in the 20-79 age group may have beenattributable to diabetes in 2010 [5].

In the Arab region, the number of deaths attributed to diabetes is about 170,000 adult people, representing more than 10% of all deaths in the region [7]. In Palestine, there is no reliable data that exist about treatment, complications, economic effect, and outcomes of treatment of the disease[8]. However, according to data from the Ministry of Health, DM is considered as the tenth leading cause of death in the oPt,being responsible for 3.1% of deaths in 2005 [8].

1.3 Self-management of diabetes

Diabetes self-management is a complex task that needs to be integrated into the patient's daily life. It plays a key role in controlling the unwanted complications of DM [18]. Successful integration requires that patients are able to reconcile their resources, values and preferences with a therapeutic regimen of a healthy diet, exercise, no smoking, glucose monitoring and medication [19]; these will not be achieved without health education of the patients and their involvement in caring for themselves[20]. The most frequent strategy for improving self-management by patients with diabetes is the participation in diabetes education classes with specialists [20]. Diabetes self-management education (DSME) is a key to quality diabetes care. Unfortunately, according to WHO, essential health care requirements and facilities for self-care are often inadequate in the Eastern Mediterranean Region[21]. Therefore, action is needed at all levels of health care to improve education of the health care team on the management of

DM in order to prevent or delay complications which are important to the community in the form of health care costs.

1.4 UNRWA Diabetes Education Program (DEP)

In the oPt, diabetes and associated complications constitute a major health problem. Prevalence as well as mortality and complication rates for both type Iand type II diabetics are highest among refugees who are already extremely vulnerable [22].

UNRWA has been implementing a comprehensive non-communicable disease strategy since 1992, focusing on diabetes and hypertension. In 2011, UNRWA received a grant to improve management of diabetes in UNRWA clinics in the oPt. The project period wasfrom March 2011 until May 2014. The aim of the project was to improve general diabetes care and management in Gaza and the West Bank in UNRWA clinics providing service to Palestinian refugees by strengthening 41 UNRWA health clinics throughout the area. The project helped in building capacity of health care professionals for diabetes management, and mental health counsellors who were trained on how to manage the psychosocial issues faced by people with diabetes [22].

1.4.1 Structure of the program

In 2013, UNRWA marked thatyear's world health day by launching a campaign to combat the growing problem of diabetes and high BP in the

Palestine refugee community in Gaza, the West Bank, Jordan, and Lebanon. The six-month pilot campaign, “Life is Sweeter with Less Sugar”, is part of a wider initiative funded by the World Diabetes Foundation (WDF) to improve early detection and management of diabetes among Palestine refugees.

Under the current program, which lastedfrom April to the end of November 2013, UNRWA provided close to 100 nurses and doctors a refresher training course on diabetes prevention, management and treatment, and thirty clinics piloted the campaign’s initiatives aiming to strengthen UNRWA’s current diabetes care program. All activities were supported by a wide range of partnering organizations across four of UNRWA’s fields of operations, including WDF, the European Union (EU), and the World Food Programme (WFP). In the West Bank, additional partners included: An-Najah University, Al-Quds University, Bethlehem University, the Juzour Foundation for Health and Social Development (JFO), and the Augusta Victoria Hospital.

1.4.2 Program aim and objectives

The “Life is Sweeter with Less Sugar” campaign aimed to help Palestine refugees to prevent and control diabetes and high BP. To reach this goal, three program objectives were formulated which were: build medical staff capacity for diabetes care and treatment, increase screening activities in the community targeting high risk population (above 40 years,

obese, smokers) and to promote awareness and health education to patients and families through health competitions with cooking and exercise sessions.

1.4.3 Stratigies and activities

The campaign stratigies were divided into two parts: the medical part and community outreach activities; each part was shared between UNRWA and strategic and implementing partners to increase the impact of the campaign. The medical part was focused on medical staff's knowledge and practice on treatment and health and nutritional counseling. Community outreach activities were structured to provide patients and their families' nutritional counseling and healthy cooking sessions and exercise opportunities.

To achieve the three objectives, through the support of four fields (WFP, WDF, JFO, EU), UNRWA implemented six activities: training UNRWA health staff to counsel sufferers; increase of prevention counseling at the clinic; increase screening for early detection of diabetes and through outreach activities; increase staff/ patient counseling on diet therapy and medical management for health status control; establish community kitchens to practice healthy cooking; and form exercise groups in the refugee community for diabetic patients.

The program included weekly sessions of two to three hours duration for six months. The program's main components were educational sessions,

cooking classes and exercise sessions. An educational message in this program involved items concerning physiopathology of the disease, diet principles and healthy cooking practices, the practice of physical activities and psychological aspects relating to behavior change for controlling the disease. The classes were facilitated by a dietician, a staff nurse, a sport specialist and a psychologist. The researcher attended six days of these educational sessions in four different refugee camp clinics in the northern West Bank (Balata Camp and Camp Number 1 “Ein Beit el Ma” in Nablus, Tulkarem Camp and Jenin Camp), which helped in providing a clear understanding of the program objectives, stratigies and implementation. The UNRWA reached several academic institutions in Palestine for student participation in the implementation. An –Najah university participated in implementation through nursing ,optometry and physical education students.This partnership evolved into an evaluation research which the researcher and supervisors take responsibility for.

1.5 Program evaluation

1.5.1 Evaluation definition

Several definitions of evaluation have been offered in the literature; an evaluation is the systematic acquisition and assessment of information to provide useful feedback about some objects[23]. Another definition sees evaluation as a process of determining the value or worth of something by judging it against explicit, predetermined standards [24]. Effective program

evaluation is a systematic way to improve and account for public health actions by involving procedures that are useful, feasible, ethical, and accurate [25]. Evaluation aims to examine the operations of a program, including which activities take place, who conducts the activities,and can identify program strengths, weaknesses, and areas for improvement [26].

1.5.2 Evaluation types

There are various types of evaluations but two main philosophical approaches are formative and summative. Several specific types of evaluations fall under these approaches [23]. Formative evaluation is an on-going process that allows for feedback to be implemented during a program cycle. The common type of this approach is process evaluation which investigates the process of delivering the program, including whether the activities are taking place, who is conducting the activities, who is reached, and whether sufficient inputs have been allocated or mobilized [23,26].

Summative evaluation occurs at the end of a program cycle and provides an overall description of program effectiveness. It examines program outcomes to determine overall program effectiveness [23]. Outcome evaluation is a common type of this approach in which the evaluator investigates whether the program caused demonstrable effects on specifically defined target outcomes; and may include both short and long term results [23,26]. Another common type that falls under summative evaluation is impact evaluation which is defined as an assessment of how

the program affects outcomes, and more specifically, to quantify how large that impact is. Another definition is “the analysis that measure the net change in outcomes that can be attributed to a specific program”[27].

1.5.3 Framework for program evaluation

The Centers for Disease Control and Prevention (CDC) published a six step model toprogram evaluation to guide public health professionals in using program evaluation. Figure 1 illustrates the six steps of the CDC theoretical framework [25]

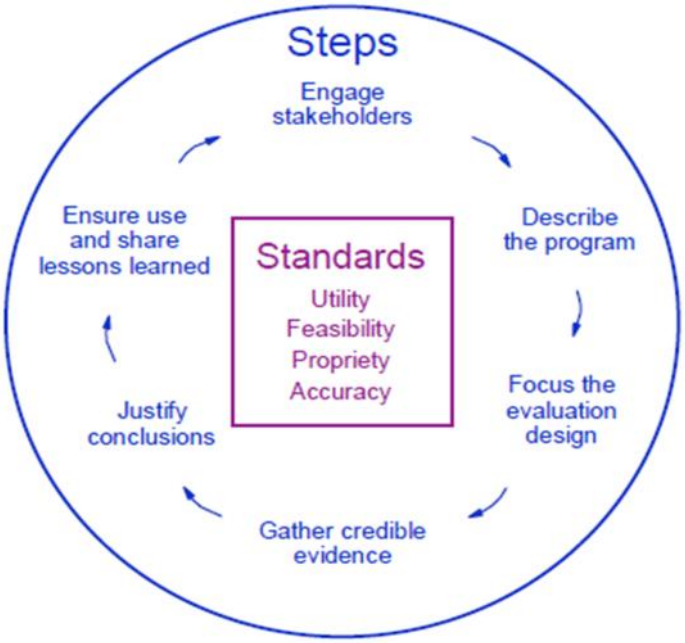

Figure 1: Recommended framework for program evaluation [25]

Engaging stakeholders is a necessary part of a credible program evaluation. Stakeholders can include management and funding partners, staff, and others that help to execute the other stepsafter becoming involved.A comprehensive program description aids in program evaluation

by defining a clear background and objectives of the program. It then aims to identify the program's greatest need, expected effects, key activities and resources.Focusing the evaluation aims to assess the issues of greatest concern to stakeholders while using time and resources as efficiently as possible. Among the items to consider are purpose, users, questions and methods, which help to determine the best type of evaluation to perform. Gathering credible evidence is a crucial step in the evaluation process as data collection will serve as the primary source of results of the evaluation. In this step, the evaluator must consider the quality and quantity of data as wellas the source of data. An evaluation's overall credibility can be improved by using multiple procedures for gathering, analyzing, and interpreting data. Justifying conclusions is the fifth step of CDC's evaluation framework in which evaluation evidence must be interpreted to determine if the program is meeting goals by comparing the findings against one or more selected standards. The final step of CDC's evaluation framework is ensuring the use of findings which should be shared with the stakeholders to provide feedback. Finally, the results of the evaluation should be disseminated to interested parties and may be published as a means of information sharing [25].

1.6 Significance of the study

Diabetes and associated complications constitute a major health problem in the oPt; it was responsible for 3.1% of deaths in 2005[8]. According to UNRWA, the prevalence of diabetes was 10.5% among

adults 40 years and older in 2000[8]. In the last ten years, the number of patients with diabetes and high BP at UNRWA's 139 clinics has more than doubled, rising from 104,742 in 2002 to 211,533 in 2011[28]; the Agency was treating over 200,000 patients with diabetes and or high BP per year, and spending 41 percent of its medication budget on drugs to treat the two conditions[28]. Therefore, with alarmingly high diabetes prevalence rates among the Palestinian refugee population, UNRWA,on 7 April 2013, in cooperation with the WDF, launched a six-month pilot camaign entitled "Life is Sweeter with Less Sugar" to improve self -diabetic care regarding adherence to diet, regular PA,and drug regimens. Evaluation for DEP applied at UNRWA clinics is necessary to determine if the classes offered impact the knowledge and behaviors of the participants. This evaluation will make recommendations based on data analysis that could offer changes to the program structure for increased effectiveness in impacting participants' self-management behaviors for diabetes. It is questioned whether this program can serve as a model for managing diabetes patients in other areas of Palestine.

1.7 Objectives of study

The main objective is to evaluate the effectiveness of the "Life is Sweeter with Less Sugar" diabetes care program applied at UNRWA clinics in the northern West Bank.

Specific objectives

1- To assess diabetic patient's anthropometric measurements (weight, BMI, and waist circumference (WC)); and laboratory tests (post-prandial BG, BP and cholesterol level))at pre and post DEP.

2- To assess diabetic patients' knowledge, attitudes and practices (KAP) at the end of the program, as well as their physical activity, medical adherence and dietary behaviors at pre and post DEP.

3- To assess the attendance rate and the reasons for non-attendance of the DEP, and to identify whether there is a significant difference in demographic and other characteristics between attendees and non-attendees.

4- To appraise the participants' satisfaction level with the program regarding its preparation, teaching methods and content as well as the impact of program on their self-efficacy in maintaining diabetes-related behaviors.

5- To appraise the opinions and experiences of health care workers (HCWs) who had been involved in the program regarding its strengths and weakness.

6- To investigate the barriers and difficulties for program implementation from the two points of view: HCWs and participants.

Chapter Two

Literature review

2.1 Diabetes self-management education

2.2 Diabetes management programs

2.3 Effectiveness of diabetes education programs

Chapter Two

Literature review

2.1 Diabetes self-management education

Patient education has been considered a fundamental part of diabetes treatment since the beginning of last century. It has been shown to be effective in improving metabolic control and reducing complications [29]. Health education of diabetic patients is a priority in diabetic care not only to improve knowledge, but also to change patients' attitudes, skills and behaviors [30]. Unfortunately, 50% to 80% of people with diabetes have significant knowledge and skill deficits.Also, mean glycated hemoglobin (HbA1c) levels are unacceptably high both in people with type I and type II diabetes [31]. Diabetes self-management education (DSME), the process of teaching people to manage their diabetes, has been considered an important part of the clinical management of diabetes since the 1930s [31].DSME is the formal and ongoing process of improving knowledge, skills and abilities necessary for self-care for individuals with, or at risk fordiabetes [32]. The value of DSME is evident from research which suggests that patients who never received DSME had a remarkable four fold increased risk for major diabetes complications compared with patients who received some form of DSME[33].The overall objectives of DSME are to support informed decision making, self-care behaviors, problem solving,and active

collaboration with the health care team and to improve clinical outcomes, health status and to prevent acute and chronic diabetes complications[31,34].

Many national groups and organizations have developed guidelines to assist in theimplementation and evaluation of programs targeted toward diabetes management. Themajority of guidelines recognized by these organizations are based on the National Standards for DSME, which were developed by a committee composed of individuals representing the ADA who reviewed and revised those standards approximately every 5 years because of the dynamic nature of health care and diabetes-related research[34]. The most recent standards for DSME were published in January of 2014[34]. Recently updated national standards for DEME are based on evidence for its benefits. The researched benefits of DSME cited in these standards of care include improved diabetes knowledge and self-care behavior, lower HbA1c values, lower self-reported weight, and improved quality of life [35].

2.2 Diabetes management programs

The increase in the prevalence of diabetes, coupled with the complexity of its treatment, such as dietary restrictions and use of medication, reinforces the need for effective education programs that are viable for the public health service[36]. Various organizations such as ADA, the National Institute of Health (NIH) and the CDC fund diabetes programs and initiatives to reduce the prevalence, complications, and deaths

associated with diabetes. The National DEP was launched in 1997 which is cosponsored by NIH and CDC. The aim of NDEP is to improve the treatment of diabetes and its complications, to promote early diagnosis, and to prevent the onset of diabetes[37].The objectives of NDEP are “to increase public awareness of the seriousness of diabetes; to improve understanding about diabetes to promote better self-management behaviors; to improve health care providers’ understanding of diabetes and its control; and to promote health care policies that improve the quality of and access to diabetes care” [37].

2.3 Effectiveness of diabetes education programs

2.3.1 Globally:

Several studies have evaluated the use and effectiveness of DSME programs in the world. One of these studies conducted in South Africa aimed to evaluate the (Take Five School) group education program for patients with type II diabetes. 84 patients from 6 different clinics completed four sessions of an hour each. Questionnaires, interviews with HCWs and focus group discussions with patients were used. The results showed a significant improvement in adherence to a diabetic diet, PA and foot care, while qualitative data revealed that comprehensive education was appreciated[38].

Another study conducted in Spain aimed to assess the effectiveness of the (PRECEDE) (Predisposing, Reinforcing, Enabling, Causes in

Educational Diagnosis, and Evaluation) education model in the metabolic control in patients with DM type II. 600 patients were randomized in two groups, PRECEDE and conventional model for health promotion education. HbA1c and systolic BP levels decreased significantly in the PRECEDE group, while the decrease levels in diastolic BP and low-density lipoprotein (LDL cholesterol) were non significant[39]. On the other hand, a study conducted in South India to evaluate DEP emphasized that the KAP score and PPBG of test group patients improved significantly ($P<0.001$). Total cholesterol, triglycerides and LDL also showed a decrease in the test group [40].

These studies showed that DSME can help patients better manage their diabetes. Other studies showed similar results; one of them conducted in Texas aimed to assess effectiveness of DSME program at the community clinic. A total of 70 patients completed the training program. After a twelve-month follow up period, mean HbA1C improved significantly from 9.7 to 8.2 (P value< 0.001)[41]. A prospective study carried out in Canada aimed to evaluate the long-term success of a DEP and to assess if there was a decline in learned self-care practices over 6 months. This study showed that attendance at a DEP is beneficial in terms of long-term glucose control (HbA1c) which improved significantly (pre 8.5 ± 1.69 vs. post $7.3\pm1.4\%$, $p<0.05$) and reported self-care practices (eating frequency, exercise recommendations, foot care and glucose monitoring recommendations) and, if maintained,would have a significant impact on costs associated with

DM[42]. Furthermore, a study done in Croatia aimed to evaluate the impact of a structured educational program in diabetic patients. The study results showed that patient education was found to have significantly improved glycaemic control ($p=0.011$), BMI ($p<0.001$) and knowledge about the disease ($p<0.001$) six months after the program in a random sample of 32 diabetic patients who attended a 4-week educational units program [43].

Another study conducted in NewZealand aimed to evaluate the pilot group DEP for diabetic patients. Multiple evaluation methods were used to assess behavioural changes among participants and if they were satisfied with the educational sessions. The study findings showed that the sessions were very poorly attended by enrolled participants; there were no significant results in regards to improving self-efficacy or behaviour. However, overall participants were satisfied with the program. The external review tool, which was completed by the researcher demonstrated that four areas in the program needed to improve [44]. On the other hand, a pilot study conducted in Malaysia aimed to evaluate a culturally tailored Malaysian Diabetes Education Module (MY-DEMO) based on the health belief model. The results of pre- and post questionnaires showed that there was a significant increase in the total score in post-tests (97.34 ± 6.13) compared to pre-tests (92.80 ± 12.83) ($p < 0.05$); improvement in post-test score was in 4 of 6 items tested while the remaining 2 items which measured the perceived severity and cues to action had poorer post-test score. The

preliminary results suggest that MY- DEMO may be suitable for integration with the existing DEPs in Malaysia [45].

A study that took place in London (United Kingdom) aimed to determine the impact of Ramadan-focused education on weight and hypoglycaemic episodes during Ramadan in a Type II diabetic Muslim population. The curriculum targeted physical activity, meal planning, glucose monitoring, hypoglycaemia, dosage and timing of medications. At 12 months after attending the program, there was a mean weight loss of 0.7 kg after Ramadan ($p<0.001$), a decrease in the total number of hypoglycaemic events ($p<0.001$), and HbA1c reduction was sustained in patients who attended the educational program [46].

Despite the many systematic reviews published on the efficacy of self-management education models[33,47], observed outcomes are heterogeneous due to thevariable duration of study periods, types of interventions, and target populations. Most programs obtained some benefits over standard care in improving diabetes knowledge, self-management behaviors and clinical outcomes. A meta-analysis of 20 randomized controlled trials (3,094 patients) indicated that the programs produced a significant reduction in HbA1c[47]. However, reviews have demonstrated sharp declines in benefits only a few months after interventions ended[33]. There was no strong evidence that interventions were effective in reducing morbidity, mortality and cost effectiveness among patients with diabetes[47]. Among the demographic and intervention

characteristics examined, only duration of the intervention was found to predict a programme's success[33].

Although DSME programs have been shown to improve patient outcomes [38-47], initial and ongoing attendance at DEPs is often poor. For this reason, several studies evaluated the program's non-attendees to learn more about reasons for non-attendance in order to improve program attendance. In Canada, a cross-sectional descriptive study was conducted to evaluate the demographic characteristics of attendees and non-attendees and their reasons for non-attendance at the DEP. The survey of a random list of clients found that attendees were more likely to be older, come from lower income groups, and be retired while non-attendees were more likely to be working full-time than attendees. The most common reason cited for non-attendance was being too busy[48]. On the other hand, the Department of Health and Human Services in Maine (United States) has published a report about barriers to referral and participation in DSME in Maine. After conducting a statewide survey of providers, diabetes educators and diabetic patients; the results showed that there were perceived barriers in which the patients did not feel they needed the information offered by these programs. Results also point to a need to address structural barriers to participating in DSME where the programs were not offered at times and/or dates that were attractive or convenient and there was often difficulty in transportations. The survey results also showed that the patients did not know enough about these programs [49].

2.3.2 Regionally:

A randomized controlled study conducted in Iran aimed to evaluate the efficacy of DEP on health-related quality of life of diabetic patients. Eighty patients were randomly selected and assigned to two groups, 40 to the intervention and 40 to the control group. All participants were followed for 4 months. The intervention group showed a statistically significant increase in mean of knowledge, behavior, physical and psychological health and also had a statistically significant reduction in mean of HbA1c [50]. Another randomized controlled study was conducted in Turkey to evaluate the effect of patient education on knowledge, self management behaviours and self efficacy in patients with type II diabetes. Eighty patients with type II diabetes were randomly assigned to the intervention and control group. Two weeks after the education, significant improvements were observed in taking regular walks (p=0.043), recognising nutrients with high caloric content (p=0.037), recommended daily fat distribution (p=0.024), and in regulating BGlevels to avoid complications (*p*=0.002); while patient education had a limited effect on knowledge and self-reported self management behaviours in participants[51].

A study carried out at Abha Primary Health Care Center, in the Asir region of Saudi Arabia aimed to evaluate DEP at this center. The files of diabetics who attended the center and the essential structure of the program were evaluated by using checklist sheets. The results found that compliance

to appointment was good in 60% and poor in 30% of diabetics. About 73% of the diabetics received at least one health education topic while 27% did not receive any health education at all. Only 33% of diabetic patients had adequate health education, 80% recievedan explaination about diabetes and 77% were educated about the role of diet. Essential structure for DEP was found to be unsatisfactory [30]. Another study conducted in Saudi Arabia aimed to assess the effect of a 5-day intensive DEP on metabolic control among Saudi type II diabetic patients. After a one year follow-up period,all metabolic parameters had improved significantly (P<0.001) except for high density lipoprotein (HDL cholesterol). The study demonstrated that DEP was an effective approach and reinforced the need for implementing such a program as an essential part for metabolic control among diabetic patients [52].

In Egypt, an intervention study conducted to evaluate the effectiveness of educational program on 122 type II diabetic patients who attended the diabetic clinic in Zagazig University revealed that there was significant improvement in patients' knowledge and attitude regarding different aspects of disease with lowering of their mean level of BG and HbA1c.This study sent a strong massage to diabetes health care providers and educators for the actual need for developing education and prevention program about type II diabetes at out-patient clinics[53].

In Palestine, a quasi-experimental study with pre and post-test was implemented to measure the effect of DEP for diabetic patients attending

the Diabetic Clinic in Tulkarm Governorate of Health. The results revealed that there were significant improvements in weight, BMI, WC, fasting BG, HbA1c and total cholesterol level. Moreover, a significant increase in knowledge evaluation test scores were shown after educational intervention. The study recommended that DEPs should be an integral part of health planning in Palestine [54]. Another quasi-experimental study conducted at UNRWA clinics in the Gaza Strip (Rimal, Nusirat and Khan Younis) aimed to evaluate the impact of educational program in reducing the prevalence of GDM and its associated health problems among pregnant women. The sample consisted of 188 pregnant women, 87 subjects who attended the educational program and 101 controls who received the routine prenatal care. The educational program consisted of four main sessions, given jointly with an educational booklet for subjects. The study concluded that the education program had a positive impact on knowledge and practice regarding GDM such as adherence to healthy habits, which were significantly higher in the post-test compared with the pre-test and those of the control group [55].

Chapter Three

Methodology

3.1 Study design, setting and period

3.2 Study Population

3.3 Sample size and sampling method

3.4 Data collection Tools

3.5 Study Variables

3.6 Data collection Procedure

3.7 Data Analysis Plan

3.8 Ethical Consideration

Chapter Three

Methodology

3.1 Study design, setting and period

A mix quantitative and qualitative evaluation study was conducted for the purpose of evaluating of the effectiveness of the diabetes care program applied at UNRWA primary health care clinics in four different refugee camps (Balata and Number 1 “Ein Beit el Ma” in Nablus, Tulkarem and Jenin Camps) in the northern West Bank. It was conducted during the period from February to April, 2014, nearly three months after the end of the DEP.

- Quantitative evaluation:

1. For the first and second objectives, a comparative study with pre- and post-test was conducted to assess anthropometric measurements, laboratory tests, medical adherence, PA and the dietary behaviors of the participants regarding DEP.

2. For the third obejective, a descriptive cross -sectional study was conducted to evaluate the socio-demographic characteristics of non-participants and their reasons for not attending DEP.

-The qualitative evaluation:

For the fourth, fifth and sixth objectives, focus groups were conducted with HCWs and participants in each clinic to explore their

opinions and experiences regarding the program as well as to assess the barriers for the program implementation.

3.2 Study Population

The population of the study consisted of:

- The diabetic patients attending the four UNRWA clinics (Balata Camp , Camp No. 1, Tulkarem Camp and Jenin Camp).
- HCWs at UNRWA clinics who had been involved in the program implementation including the dietician, staff nurse, sport specialist and the psychologist.

3.3 Sample size and sampling method

- For the first, second and fourth objectives, all diabetic patients attending UNRWA clinics and received education for the “Life is Sweeter with Less Sugar” program were considered as a study sample (75 participants).
- For the third objective, a total of 120 subjects were selected by a simple random sampling technique from diabetic patients attending UNRWA clinics, but not having participated in the program; nearly 30 patients were taken from each clinic. The sample size for non-attendees was calculated by duplicating the number of participants which was from 15-18 participants in each clinic.

- For the fifth and sixth objectives, all HCWs (9) who had been involved in the program implementation were invited and interviewed in focus groups.

3.4 Data collection Tools

Differenttools were used for data collection in this study.

- ***Firstly***, the pre- and post- questionnaire was developed by UNRWA (Annex I). It was built up as a tool for assessing the participants'pre- and post-DEP biometric measurements, medical adherence, PA,and the dietary behaviors. The questionnaire consisted of five sections, mainly covering the following areas: clinical charachterstics of participants and their biometric measurments, medical adherence, and PA and eating behaviors before and after the program.

  For the PA and eating behaviors questions, adhering to the guidelines for disease management or instructions from HCWs merited a score of "one"; non-adherence was given a score of "zero". For medical adherence questions,the questions are Yes/No questions in which one point is given for each sentence based on the answer. In all questions, one point is given for each "NO" answer except for question number 3 and 6 where one point is given for the "YES" answer. The total score is the summation of the scores for the 6 questions. The total score obtained ranges from 0–6. In this study, weconsidered participants with a total score of less than 4 asnon-adherent. While

those that scored ≥ 5 were considered as adherent. The scoring for medical adherence questions was based on self-reported Morisky medication adhernce scale [56]. Although not many similar questions have been found, there were items assessing the unintentional non-adherence due to forgetfulness and carelessness and other items were measuring the intentional non-adherence such as stopping medications when feeling better or worse.

- ***Secondly***, a structured,inteviewer-administered questionnaire (KAP questionnaire) was developed for assessing the konwledge, attitude and practiceof the participants at the end of the program (Annex II). It was constructed by the researcher according to the literature [54,57,58].

The KAP questionnaire was initially pilot-tested on a small sample (25 diabetic patients) who did not participate in the DEPto assess the feasibility and thetime needed to fill out the questionnaire. Data obtained fromthe pilot study were analyzed, and accordingly necessary modifications were done. The KAP questionnaire's reliability and the internal consistency was tested using the cronbach's alpha which was found to be acceptable ($\alpha > 0.70$) for all questions.The final form of the KAP questinnaire consisted of two sections:

A- Socio-demographicand clinical characteristics of the participants: age, gender, educational level, occupation, income level,marital status, residence place, type and duration of DM, smoking, chronic diseases, and daily number of medications taken.

B- Questions on konwledge, attitutes and practiceinclude 25 questions; each correct answer was given a score of “one” and each wrong answer was given a score of “zero” regarding knowledge questions, while in attitude/practice questions, participants were considered to have answered the questions correctly if they adhered to the recommended guidelines. The maximum possible scores for knowledge, attitude and practice are 19, 2 and 4 respectively. According to the literature, we considered a score of 15–19 “Good Knowledge”; a score of 11–14 ‘Moderate Knowledge’ and 0–10 ‘Poor Knowledge’[58,59].

- **Thirdly,**another semi-structured questionnaire was developed by the researcher to evaluate the socio-demographic characteristics of non-participants and their reasons for not attending the health education program (Annex III). It cosisted of two sections:

A- Socio- demographic and clinical characteristics of the diabetic patients: age, gender, educational level, occupation, income level,marital status, residence place, type and duration of DM,

smoking, chronic diseases and daily number of medications which are taken.

B- The second section involved questions about barriers to attending the program which had 9 possible responses, and the clients were also encouraged to provide their own reasons for non-attendance.

- ***Fourthly***, eight focus group discussions (FGDs) were held in the four UNRWA clinics; two for each clinic; one with the program participants and the other with the HCWs who had been involved in the program implementation. Focus groups are a special type of group used to gather information frommembers of a clearly defined target audience. Focus groups arecomposed of six to twelve people who are similar in one or more ways andare guided through a facilitated discussion on a clearly defined topic. This tool is also defined as “carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment”.Focus groups are shown to be an effective way to obtain a different range of information in evaluation of research, and help understand the ‘why’ behind attitudes and behaviours [60].

The participants were invited by phone to focus group discussionsthat were held in the primary health care in each clinic.

An interview guide for the participants focussed on their overall opinions, experiences and satisfaction level with the program, as well as their perceptions of how the program improved their self efficacy (Annex IV). The second focus group discussion involved all HCWs who participated in the program implementation in each clinic.The interview guide for the HCWs focussed on the strengths, weakeness, and barriers ofthe program implementation (Annex V).

3.5 Study Variables

3.5.1 Dependent variables:

- Anthropometric measurements: weight:Kilogram (continuous), Height:meter(continuous), BMI: Kg/m2 (continuous), WC: centimeter (continuous).
- Laboratory tests: PPBG: mg/dl (continuous), BP: mmHg (continuous), cholesterol level:mg/dl (continuous).
- PA and dietary behavior scores at pre and post- educational program (continuous).
- Medical adherence scores at pre and post- educational program (continuous).
- Knowledge, attitude and practice scores at the end of the program (continuous).

3.5.2 Independent variables:

- Socio-demographic information: Age (continuous), gender (nominal as male or female), educational level (ordinal: primary, secondary and university education), occupation (nominal), income level (ordinal: low, medium or high), marital status (nominal: single, married, divorced or widowed), residence place (nominal: refugee camp, village,or city).

- Medical information: type of diabetes (nominal either type 1 or 2), duration of diabetes (ordinal: less than one year, from 2-5 years, from 5-10 years and more than 10 years), chronic diseases (nominal), smoking(nominal either yes or no), daily number of medications (continuous).

- Reasons for not attending the educational program: nominal involved issues regarding transportation, workforce, and timing of the program/classes.

3.6 Data collection Procedure

High risk diabetic patients, especially those with high BMI,uncontrolled BG and those who were most likely to be interestedin attendingwere invited to the “Life is Sweeter with Less Sugar” program byphysicians and other clinic staff during the regular visit to the clinic for treatment or follow up. The UNRWA pre-post questionnaire was filled out

by the staff nurse and/or the dietician through highly structured interviews with the participants. The interviews were carried out at the beginning of the program and directly at the end of the program. Biometric measurements were collected by the clinic staff every month. Both the baseline and the follow up data about the biometric measurements, physical activity, dietary behaviors, and medical adherence of the participants were used.

The KAP of participants were assessed by a questionnaire developed by the researcher. All participants were invited to the clinic by telephone calls after reviewing their names and telephone numbers.Up to 2 or 3 repeat visits and calls were made by the researcher at various times to reach each participantand to achieve a higher response rate. The self-administered KAP questionnaire was given to each invited participant.The reseacher interviewed only those who were illiterate to help them in filling out the KAP questionnaire.The focus group was conducted in a suitable room in each clinic with a number of participants who were invited and accepted to participate.

In regard to non-participants, a simple random sample were selected from the diabetic patients who attended UNRWA clinics during their regular visit for follow up. A semi-structured questionnaire was filled out by face to face interviews with them.

3.7 Data Analysis Plan

The Statistical Package of Social Sciences (SPSS) version 19 was used for data entry and in statistical analysis.

Descriptive analysis:

- All data was summarized using the mean and standard deviation for continuous variables and frequencies and percentage for categorical variables.

Inferential statistics:

- At the beginning, Kolmogorov–Smirnov test was used to test the normality of the data. They were considered normally distributed if p value> 0.05.

- Paired t–test and Wilcoxon ranks test wereused to assess significant differences in biometric measurements as well as PA, medical adherence and dietary behaviors scores before and after the DEP.

- Mc-Nemar test was used for analyzing paired categorical data before and after the program.

- Chi-square test, Fisher's exact test, t-test and Mann-Whitney tests were used to identify significant differences between participants and non-participants as appropriate.

- A significance level of p value <0.05 was considered in this study.

The qualitative data was analysed using the framework which mainly involved three steps: indexing, management, andinterpretation[60,61].

3.8 Ethical Consideration

The study was approved by the Institutional Review Broad (I.R.B.) of An-Najah National University (Annex VI) and official permission from UNRWA was obtained.

Every participant in the study received an explanation about thepurpose and confidentiality of the study. All were informed that participation is voluntary.Verbal consent were taken from all participants.

All gathered data and information were treated with confidentiality andwere used exclusively for the objectives of the study.

Chapter Four

Results

4.1 Pre and post UNRWA survey to measure effectiveness of the program

4.2 Knowledge, attitude and practice among participants at the end of program

4.3 Reasons for non-attendance of the program

4.4 Focus group with the participants

4.5 Focus group with health care workers

Chapter Four

Results

Summary: The purpose of this study is to evaluate the effectiveness of the diabetes education program applied at UNRWA clinics in the North West Bank. This chapter consists of five parts: part (1) deals with assessing the pre and post UNRWA survey which involved biometric measurements, medical adherence, PA and the dietary behaviors of the participants; part (2) deals with assessing the KAP of participants at the end of the program; part (3) shows the barriers to attending the educational program from non-participants' point of view. Part (4) and part (5) show the qualitative results of focus groups which were conducted with participants and HCWs to explore their opinions regarding the program.

4.1 Pre and post UNRWA survey to measure effectiveness of the program

Among the 81 diabetic patients who participated in the first months of the health education program and filled out the baseline questionnaire through highly structured interviews with staff nurses, only 75 participants were interviewed for the follow up evaluation giving a dropout rate of 7.4%.

4.1.1 Socio-demographic characteristics

The vast majority of participants were females (94.7%).The mean age for the participants was 49.8 years with a standard deviation (SD) of 7.6. The highest proportion of participants was in the age group of 40-49

years (46.7%), followed by 50-59 years (42.7 %). Up to 92% of participants had Type II diabetes. Results also revealed that 42.7% of the participants had a history of diabetes ranging from five to ten years from the time of diagnosis, while nearly one third of the participants (28%) had diabetes for a period between one and four years. The majority of the participants had HTN (70.7%) and 15(20%) of them were current smokers (Table 1).

The results also show that the majority of participants were married and unemployed (86% and95% respectively). Also, more than half of them (51.8 %) were living in refugee camps and 53.6% of them had low levels of education, with only 7.1% of them having a higher education. In addition, 73.2% of participants lived in intermediate socio-economic conditions.

For the purpose of assessing the reasons for non-attendance at the diabetes health education program, we selected a random sample of 120 diabetic patients who did not participate in the program from four UNRWA clinics and compared their socio-demographic characteristics with those who participated in the program. We found that there were significant differences in the categories of age, gender, place of residency, occupation and educational level. The results revealed also that there was significant difference between participants and non-participants in relation to diabetic type. However, the majority of diabetic patients in both groups were taking their medication regularly (85.7% and 94.2% respectively) with no significant differences between them in relation to medication compliance ($p=0.061$) and mean number of medications per day ($p=0.837$) (Table 1).

Table 1: The socio-demographic and clinical characteristics by participation

Variable	Participant (n=75) Frequency (%)	Non participant (n=120) Frequency (%)	P- value
Age ≤ 39 years	3 (4)	6 (5)	
40 – 49 years	35 (46.7)	16 (13.3)	
50 – 59 years	32 (42.7)	54 (45)	**<0.001 ***
≥ 60 years	5 (6.6)	44 (36.7)	
Gender			
Male	4 (5.3)	27 (22.5)	**0.001 ^**
Female	71 (94.7)	93 (77.5)	
Marital status[&]			
Single	3 (5.4)	2 (1.7)	
Married	48 (85.7)	93 (77.5)	**0.055 ***
Others	5 (8.9)	25 (20.8)	
Educational level[&]			
Elementary or less	30 (53.6)	83 (69.2)	
Secondary	22 (39.3)	17 (14.2)	**0.001 ^**
University	4 (7.1)	20 (16.7)	
Place of residence [&]			
City	14 (25)	56 (46.7)	**<0.001^**
Camp	29 (51.8)	19 (15.8)	
Village	13 (23.2)	45 (37.5)	
Occupation[&]			
Working	3 (5.4)	35 (29.2)	**<0.001^**
Not working	53 (94.6)	85 (70.8)	
Income level[&]			
Low	15 (26.8)	49 (40.8)	**0.071 ^**
Medium	41 (73.2)	71 (59. 2)	
Diabetic types			
Type I	6 (8)	2 (1.7)	**0.041 ***
Type II	69 (92)	118 (98.3)	
Diabetic duration			
Less than 1 year	5 (6.7)	2 (1.7)	
1-4 years	21 (28)	43 (35.8)	**0.125 ***
5-10 years	32 (42.7)	40 (33.3)	
More than 10 years	17 (22.6)	35 (29.2)	
Hypertension			
Yes	53 (70.7)	71 (59.2)	**0.104 ^**
No	22 (29.3)	49 (40.8)	
Smoking			
Yes	15 (20)	18 (15)	**0.365 ^**
No	60 (80)	102 (85)	

^ Chi-Square test, * fisher's exact test & these variables were collected for participants later based on KAP questionnaire (n=56)

The participants' knowledge was assessed briefly in the pre and post-educational program UNRWA survey based on four basic questions. Statistically significant differences between pre and post test results were observed in knowledge of the normal level of post-prandial BG (p value <0.001) and in the knowledge of curability of DM (p value =0.017).

4.1.2 Anthropometric measurements before and after the program

We compared the anthropometric measurements of the participants before and after the program. The results indicated a significant decrease in the participants' mean weight after the program; from 96.6 kg (±17.8) to 93.2kg (±16.7) with *p* value <0.001. Accordingly, BMI was also decreased significantly (p value <0.001) after the educational program, where the mean BMI became36.6Kg/m2 (±6.6) after the educational program, compared to 38.1Kg/m2 (±6.9) before it. In addition, WC had significantly decreased from 117.1cm (±13.7) to 110.8cm (± 13.2) after the health education program (p value <0.001). (Table 2)

Table 2: Anthropometric measurements pre and post program (n=75)

Measurements	Before mean (SD)	After mean (SD)	P- value
Weight	96.6(17.8)	93.2(16.7)	<0.001 *
Body mass index	38.1 (6.9)	36.6 (6.6)	<0.001 ^
Waist circumference	117.1 (13.7)	110.8(13.2)	<0.001 ^

^ paired t- test * Wilcoxon ranks - test.

4.1.3 Lab tests before and after the program

The beneficial effects of the educational program in DM with regard to BP, post-prandial BG, and cholesterol level are summarized in (Table 3). Post-prandial BG had significantly decreased from 223.3mg/dl (± 89.7) to 173.5mg/dl (± 54.7) after the educational program (p value <0.001). On the other hand, the decrease in cholesterol level after the educational program was not significant (p=0.143).The mean value of cholesterol had been decreased to 179.6mg/dl (± 32.7) after the educational program compared to 186.5mg/dl (± 40.5) before the DEP. Furthermore, the systolic and diastolic BP decreased slightly after the DEP, but this change didn't reach significance level (p=0.621 and p=0.655 respectively).

Table 3: Lab tests before and after the program (n=75)

Measurements	Before Mean(SD)	After mean(SD)	P- value
Systolic blood pressure	133.4(14.4)	132.5 (13.2)	0.621 ^
Diastolic blood pressure	80.9 (10.5)	80.1 (13.7)	0.655 ^
PPBG	223.3(89.7)	173.5 (54.7)	<0.001 *
Cholesterol level	186.5 (40.5)	179.6 (32.7)	0.143 ^

^ paired t- test, * Wilcoxon ranks - test

4.1.4 Medical adherence before and after the program

Medication adherence for the participants was evaluated before and after the DEP. Table 4 reveals that there was significant improvement in patients' compliance, as 97.3% of participants were compliant with doctors' instructions on taking their medication after the program

(p=0.021). As well, only12.3% of the participants skipped medicine because of feeling worse when they took it after the program (p value <0.001). A statistical significant difference was also shown in participants' belief in which only 37% of them believed that skipping medicine will lead to complications before the DEP compared to97.3% after the it(p value <0.001). On the other hand, the increase in medication adherence in other items after educational program was not significant. A total of 50% participants had not forgotten to take medicine before the program. This percent had increased to 58.1% after the program. Also, 21.8% of participants were sometimes neglectful in regard to the schedule of medicine before the program. This percent had decreased to 10.8% after the program. Furthermore, participants' belief about the importance of taking medication in controlling BG did not change (p=0.100).

Table 4: Distribution of the participants' medication adherence before and after the program (n=75)

Item	Before	After	P-value*
	Frequency (%)	Frequency (%)	
Forgetting to take medication	37 (50.0)	43(58.1)	0.392
Stopping taking medication due to side effects	38 (52.1)	64 (87.7)	<0.001
Perceived benefit of medication in controlling blood sugar	73 (98.6)	73 (98.6)	1.000
Perceived benefit of medication in preventing complications	27 (37.0)	71 (97.3)	<0.001
Carelessness in taking medication	58 (78.4)	66 (89.2)	0.077
Compliance in taking medication	64 (86.5)	72 (97.3)	0.021
Overall scores(Mean (SD))	4.1 (1.2)	5.2 (1.0)	<0.001

***P value was computed using the *McNemar X2 test* except for the overall score where *Wilcoxon ranks – test* was used**

As shown in (Table 4), the results indicated a significant increase (p value <0.001) in mean scores from 4.1 (± 1.2) to 5.2 (± 1.0) after the DEP, which fall within the definition of high adherence where 81.3% of the participants showed high adherence (adherence score >4) after the program compared to 41.3% before implementing the educational program.

4.1.5 Physical activity before and after the program

The participants' attitudes and practices related to PA were evaluated based on six questions in the UNRWA questionnaire. Participants' responses in regards to PA are listed in Table 5. Attitudes toward regular exercise had increased after the program in which 98.7% of participants stated that they were trying to be physically active at post-test compared with 85.3% at baseline (p=0.006). The perceived benefit for taking part in PA had increased after the program, however this change wasn't significant (p=0.109). On the other hand, the perceived barriers which people may have had to participate in PA had decreased significantly after the program where 20(26.7%) participants stated at baseline that there were few places and facilities to exercise compared with 3 (4%) at post-test (p value <0.001). Moreover, the percentage of participants reporting that PA is accepted in their place of residence had increased significantly from 59 (78.7%) to 70 (93.3%) after the program (p=0.013).

Regarding their self- reported practices, the results showed that there was no significant difference in practicing moderate exercise as housework

between baseline and follow up data (p=0.100). On the other hand, results revealed that 67(89.3%) participants admitted to regular exercise (walking) for 35 minutes (>3days/week) at the end of program compared with only 32(42.7%) in the baseline (p value <0.001).

Table 5: Distribution of participants' attitudes and practices toward physical activity before and after the program (n=75)

Item	Before	After	P- value *
	Frequency(%)	Frequency(%)	
Positive attitude Physical activity and health	65 (86.7)	71 (94.7)	0.109
Trying to be physically active	64(85.3)	74(98.7)	0.006
Availability of places to exercise	55 (73.3)	72 (96.0)	<0.001
Social acceptance of physical activity	59 (78.7)	70 (93.3)	0.013
Practice questions Practicing of moderate exercise daily for 20 min	72 (96.0)	73 (97.3)	0.100
Walking regularly at least three times weekly for 35 min.	32 (42.7)	67 (89.3)	< 0.001

*** McNemar X2 test**

4.1.6 Dietary behaviors before and after the program

Participants' knowledge related to dietary behaviors was assessed based on their understanding of healthy cooking practices, diet modifications, and the effect of some foods on DM patients before and after the educational program. Participants were considered to have answered the questions correctly if they adhered to the recommended guidelines. On evaluating this part of the questionnaire, statistically significant differences between pre and post test results were observed in four questions out of 13 after applying Mc-Nemar test. However, the overall scores of the participants were significantly (P value <0.001) higher

at the end of the program (Table 6). The majority (60%) of participants were aware about when they should add salt during the preparation of food at the end of program, while only 19 (25.3%) of them answered correctly before the program (p value <0.001). In addition, 57(76%) of them knew about healthy cooking practices in terms of using fat/oil during the preparation of food at the end of program compared with only 11 (14.7%) participants in the baseline (p value <0.001). Most of them 56 (74.7%) did not eat any unhealthy food while watching TV in the follow up, compared with 33 (44%) in the baseline (p value <0.001). When the participants were asked about the effect of some foods on the health of diabetic patients, a statistically significant difference was observed in correct answers related to legumes and cereals, which had increased significantly after the program (p= 0.002).

Table 6: Distribution of participants' appropriate knowledge about dietary behaviors before and after the program (n=75)

Item	Before	After	*P-value**
	Frequency (%)	Frequency (%)	
The best methods of healthy cooking	14 (18.7)	18 (24.0)	0.541
The best type of oil used in cooking	12 (16)	11(14.7)	0.100
The best time to add salt during cooking	19 (25.3)	45 (60.0)	<0.001
The best way to add oil during cooking	11 (14.7)	57(76.0)	<0.001
Eating foods such as (chocolate, chips, or nuts) while watching TV	33 (44)	56 (74.7)	<0.001
Vegetables and DM	73(97.3)	74 (98.7)	0.100
Fat and DM	71 (94.7)	74 (98.7)	0.375
Olive oil in large quantity and DM	68(90.7)	70 (93.3)	0.754
Rice, potatoes and bread in large quantity and DM	68 (90.7)	74 (98.7)	0.070
	Frequency (%)	Frequency (%)	
Legumes and cereals in specific quantity and DM	59 (78.7)	71 (94.7)	0.002
Juice and DM	70(93.3)	70 (93.3)	0.100
Sweets and DM	74 (98.7)	74(98.7)	0.100
Soda and DM	67 (89.3)	68(90.7)	0.100
Overall scores*(Mean (SD))*	8.5 (1.2)	10.2 (1.2)	<0.001

***P value was computed using the *McNemar X2 test* except for the overall score where *Wilcoxon ranks – test* was used**

Regarding their self- reported practices, most participants ate their breakfast earlier at the end of the program where the mean had significantly decreased from 8.4 (± 1.6) to 7.8 (± 1.1) at the end of program (p=0.002). As well, the number of meals had significantly increased from 2.9(± 0.8) to 4.9(± 1.3) after the health education program (p value < 0.001).

4.2 Knowledge, attitude and practice among participants at the end of program

A well-structured questionnaire was developed by the researcher for assessing the KAP of the participants at the end of the program. Out of 75 invited participants, 56 accepted and were interviewed. On evaluating the knowledge, we found that 44 participants (78.6%) knew that diabetes is a condition characterized by raised BG and 39 participants (69.6%) knew that it is considered a chronic disease. The majority of patients were aware of the diabetes types, symptoms, and their risk factors (76.8%, 85.7% and 82.1% respectively) (Table 7).

The vast majority of all participants(96.4%) knew about the importance of frequent checking for BG and all of them (100%) were aware of the consequences of diabetes. Furthermore, results revealed that nearly 94.6% of participants were aware of factors that help in controlling BG. Also, 94.6% of participants responded that salt and smoking have dangerous consequences and could increase complications of diabetes (Table 7).

Of the 56 participants, only 12(21.4 %) knew that diabetic patients should check their eyes once a year. Another crucial finding of the study was that only 25 (44.6%) knew the importance of foot checking every three months. Finally, 51 (91.1%) participants were aware of symptoms of hypoglycemia and 49 (87.5%) knew how to manage these symptoms by using table sugar. However, 12.5% of the participants had no idea of how

to deal with these symptoms. Overall, participants had a mean knowledge score of 16.0 (±1.9) from 19 knowledge-related questions which falls within definition of “Good Knowledge”. Accordingly, (80.4%) were classified as having a good level of knowledge with a knowledge score 15-19, (17.9%) have a moderate level of knowledge with a score of 11-14.

Table 7: Distribution of the participants' correct answers to knowledge questions (n=56)

Knowledge questions	**Frequency (%)**
Diabetes definition	44 (78.6)
Diabetes is considered a chronic disease.	39(69.6)
Diabetes types	43(76.8)
The symptoms of DM	48 (85.7)
The risk factors of DM	46(82.1)
The importance of BG monitoring	54(96.4)
Diabetes complications	56(100)
Lifestyle factors that can control blood sugar	53(94.6)
Monthly visits to diabetic clinic	53(94.6)
The importance of a regular exercise regimen	52(92.9)
Daily number of meals	54(96.4)
The importance of food regulation	49(87.5)
Foods that raise blood sugar	53(94.6)
The importance of reduction of salt in food	53(94.6)
The importance of quitting smoking	52(92.9)
Eye examination for diabetic patients	12(21.4)
Foot examination for diabetic patients	25(44.6)
The symptoms of hypoglycemia	51(91.1)
Hypoglycemic symptoms management	49(87.5)
Knowledge Score (Mean (SD))	16.0 (1.9)

The response of the participants regarding the attitude/practice related questions are listed in Table 8. Most of the participants reported good medication adherence in which 43 (76.8%) participants seemed to be compliant with drug therapy, as they indicated never missing the dose of their anti-diabetic medications. Furthermore, 52 (92.2%) of them had made monthly visits to diabetic clinics and took their medications as prescribed by the doctor. Attitudes toward regular exercise and dietary modification was positive in which 44(78.6%) participants admitted to regular exercise and 50(89.3%) participants adhered to the recommended controlled and planned diet.

Regarding their self- reported practices during the previous six months regarding routine BP monitoring and their eye examination, it was found that compliance to check BP was present in the majority (82.1%) of participants and only 28.6% of them did not comply with doctors' instructions in the examination of their eyes. The mean (SD) scores of the study population regarding the KAP outcomes were evaluated where most of the participants displayed satisfactory scores regarding knowledge, attitude and practice in relation to diabetes (KAP scores), as their mean (SD) overall score was found to be 20.1(± 2.5) out of 25 questions.

Table 8: Response of participants to attitude/practice questions (n=56)

Questions	Frequency (%)
Missing taking the doses of diabetic medication	
Yes	13 (23.2)
No	43 (76.8)
Maintaining regular clinic visits	
Yes	52 (92.9)
No	4 (7.1)
Physical activity	
Daily	19 (33.9)
Weekly	20 (35.8)
Monthly	5 (8.9)
Not at all	12 (21.4)
Following a controlled and planned diet	
Always	24 (42.9)
Sometimes	26(46.4)
Rarely or not at all	6 (10.7)
The last time when blood pressure was checked	
One month ago	46 (82.1)
Two months ago	9 (16.1)
Six months ago	1 (1.8)
The last time when an eye examination was done	
≤ One year	40 (71.4)
>One year	16 (28.6)
Practice scores /6	4.3 (1.2)

4.3 Reasons for non-attendance of the program

A semi-structured questionnaire was developed by the researcher where a random sample of 120 diabetic patients was asked during face to face interviews to identify barriers to attending the educational program. Results revealed that out of 120 diabetic patients, 105 (87.5%) reported that they had never heard of the program. However, when they were informed about the program and its nature, most of them stated that they would like to participate in the future. Regarding the non-attendees who had heard about the program but did not participate, some of them reported more than one barrier, but the most common reason cited was time of program, which

was not suitable for them. Another common reason was being too busy (Table 9). One of the patients reported that she could not practice PA and another one claimed that she heard about the program recently.

Table 9: Identified barriers to participate in the program (n=120)

Reason	Frequency (%)
Never heard of the program	105 (87.5)
The time was not suitable	8 (6.6)
Too busy	6 (5)
Do not need help	2 (1.6)
Other health issues more important	1 (0.83)
Forgetting	1 (0.83)
Transportation issues	1 (0.83)
Travelling	1 (0.83)

4.4 Focus group with the participants

The aim of conducting focus group with participants is to get additional in-depth information about their overall opinions, experiences and satisfaction level with the program. I communicated by phone with participants to make appointments and to invite them for focus groups in each clinic. The number of participants who accepted the invitations was in the range of 5-10 in each focus group, which were conducted at each clinic during the period of Feb 20thto March 10th, which was nearly three months after the end of the program due to UNRWA's strike. A semi-structured interview guide was prepared in which four general questions were prepared to be discussed within the same context (Annex IV). The focus groups, which lasted for approximately one hour, were recorded for the purposes of capturing details, but all comments are confidential and are never attributed to individual participants. Tapes and notes from the

interviews were transcribed and analysis was done by organizing the data into general topics according to the questions posed. As a result, four themes were raised in response to interview questions:

1. Participants’ opinions and satisfaction level about the program

2. Program aspects that were liked and disliked

3. Impact of the program on participants’ knowledge and behaviors

4. Difficulties and suggestions to improve the program

The focus groups began with questions concerning the nature of program and the content of sessions inside it. The participants were asked to describe the activities which were done during the program. Firstly, the participants mentioned that there was a weekly appointment of two hours' duration in which the main components were educational sessions in regard to pathophysiology of the disease, its signs, symptoms and complications, diet principles and the importance of adherence to treatment and blood tests. They added that cooking and exercise sessions were implemented twice a month in which they learned healthy ways to cook and the exercises which must be conducted regularly. Moreover, psychological aspects relating to behavior change for controlling the disease were offered by a psychologist in each clinic as stated. Results also revealed that participants were informed about the program through various ways in each clinic and

their decision to enroll was based on recommendations from staff nurses, as they were categorized as high-risk groups.

1. Participants' opinions and satisfaction level about the program

Most participants rated the quality of the heath educational program at UNRWA's clinics as excellent, and a small number of them described it as good. All participants emphasized that the program was worth their time. One participant said, "we postponed all other meetings in order to attend this weekly session." Another commented, "I was interested in attending each session every week." The information which was received in this program was found to be very useful by all participants. One participant said, "the program was positive and we benefited from all sessions which were offered." All participants appreciated this comprehensive program that encompassed knowledge about diabetes and its psychosocial stress, a healthy lifestyle and how to apply the new knowledge in their daily life. Most participants felt that they received a lot of information in regard to diabetes, its complications and self-management behaviors such as healthy cooking practices, regular exercise and controlled diet. Furthermore, participants found that they benefited from having a number of staff facilitating the program in which each staff member had a different type of expertise, in addition to students who came from An-Najah University. One participant described: "we did not ever feel bored during the session because different activities were offered by different staff members." Participating in the program, therefore, helped to increase participants' self-

efficacy in control of their life, especially in the area of healthy eating and PA, as described by one participant: “the program changed our quality of life positively”. Participants were asked to rate the degree to which the educational program met their needs. Nearly all participants stated that almost all their needs had been met, while some participants commented that some activities were incomplete and they hoped to have more; for example, some suggested that more exercises could be added to the sessions. One participant said: “really, I hoped that the exercise sessions were more frequent, and not just once a week”. Some participants felt that a greater focus on complications would increase motivation to adhere to treatment. “If information was presented on a projector or LCD, it could be better in offering realistic pictures, especially regarding the complications of diabetes,” as one participant commented.

2. Program aspects that were liked and disliked

When questioned, all participants reported that they liked everything in the program and it was exciting. As one participant summarized, “I liked everything in this program, I learned from it how to look after myself in all aspects”. Most participants agreed that psychological and social support was the most beneficial aspect they received from attending the program. One participant commented: “I met people with similar experience and having the same disease, which allowed me to exchange experiences with them”. However, a broad range of answers was provided. Some participants reported that the most useful information was the one about

healthy eating in general and cooking sessions in particular. For example, some participants mentioned that the program helped them to learn how to manage their diet and how to prepare food by using healthy ways. Learning how to practice PA was another aspect that the majority of participants felt they benefited from.

When participants were asked about the contents that they disliked, they initially responded that there was nothing about the program that they did not like. However, as the discussion continued, some participants talked about certain aspects of the program that they would like to see improved or changed in some way. I noticed that all participants in all clinics reported that PA facilities were inadequate, other participants suggested to hold exercise sessions outside the camp. Some participants thought that the invitation to participate could be improved. The main pitfalls were that there was no adequate advertising for the program; also,the lack of incentives to participate in the program wasstated by other participants. One participant mentioned: “I had talked to my neighbors and friends about this program and found that all of them were not aware of it". Another one added: “I had invited some people who had declined to participate due to a lack of motivation".

3. Impact of the program on participants’ knowledge and behavior

Almost all participants reported that they gained new information and knowledge by participating in this program. This knowledge pertained

to all aspects of diabetes-related behaviors with a specific emphasis on topics regarding healthy eating, PA and socio-psychological aspects of diabetes. On the other hand, few participants considered information only as supporting their knowledge in which the program provided the practical application of previously known information in the area of healthy lifestyles. Some participants mentioned that the information in regard to blood tests was very useful to them.One participant said: “the program helped me to understand the significance of blood tests and what my blood tests mean". Other participants found that the sessions in regard to diabetes complications and medication adherence were very beneficial. Some of them also reported important physical changes including reduction in weight and BG testing as one of them stated that her weight had decreased by 10 kg and another one by 20 kg.

Behavior changes were reported in different areas of diabetes-related behaviors. Changes of eating behavior and PA were the most mentioned ones. It appears that this program helped participants gain confidence in regard to initiating, as well as implementing and maintaining these changes. The participants mentioned that these changes are becoming part of their daily routine and that they had overall positive effects on their life. One participant described the changes to PA as follows: "the program changed our beliefs and attitudes regarding practicing PA and walking in our residence". “I am now practicing walking six times weekly,” was stated by another. Other participants provided examples when discussing the

implementation of healthy eating practices. Almost all participants talked about the importance of increasing the number of meals to be six meals daily with reduced quantities. As one participant commented: “I used to have my breakfast at 2:00 PM, but now I am eating it at 6:00 am; consequently, my medication adherence is improving”. Another one added: “I used to eat eight pieces of bread and more every day, but now I eat only one piece”. Participants felt that HCWs are interested to implement the program; as some of participants stated “a notebook was given to us in order to register each type of meal which was consumed and at what time to be reviewed by a dietician”. Participants also highlighted the importance of teaching them healthy cooking practices in controlling their diabetes; most of them stated that they are implementing changed practices in cooking, and it is seems to be accepted by their families.

Some participants mentioned that the program helped them to disseminate the lessons learnt and to educate others, such as their family members, friends and neighbors. Furthermore, participants felt that their families and friends are helping them by accommodating their diabetes-related behaviors. As one participant described, “my friends did not drink juice in supporting me during social visits”. Most participants viewed support received from their families in regard to those changes positively; there were, however, a few exceptions who reported that they did not change due to their families' rejections, especially for healthy cooking practices.

Finally, some participants talked about the confidence they now had to continue their established behavior in the future. Participants felt that the knowledge they received provided them with confidence to control their own life, especially in regards to healthy eating. As one participant mentioned, "a planned and controlled diet became part of my life with some breakthroughs in a few cases”.

4. Difficulties and suggestions to improve the program

When participants were asked to identify difficulties during implementing the program, almost all participants did not report any challenge. However, some participants faced difficulty in regards to the transportation; this is because their residence (in a village) is far away from health clinic in the refugee camp. Also, some of them complained that sessions had not started on time due to the late arrival of participants. One participant commented that “sometimes I did not see anyone when I came at 10:00 am”.

On the other hand, participants had very different ideas in regard to improving aspects of the program itself. For example, they mentioned improvement of teaching tools, providing incentives and motivations to participate, in addition to increasing the availability of PA facilities. The majority of participants from four health clinics agreed that it was necessary to introduce additional entertainment activities to motivate them to continue attendance. They noted that some participants dropped out of

the program after two to three sessions. One participant said: “at the beginning of the program, there were nearly 40 participants, and after some weeks, the number decreased to 20".Participants provided examples when discussing those activities. One participant pointed out that: "it would be better if there is an incentive or rewarding for the biggest loser in weight among the participants". Another one added: “I wished if there had been a meeting with other participants in other health clinics, in order to increase competition between us". Also, all participants expressed the wish for a monthly picnic for them because they felt that it would provide them with an opportunity to decrease their socio-psychological stress. Some participants suggested the provision of BG testing devices for those who participated in the program. Another suggestion, which almost all participants talked about, was the introduction of new facilities for practicing physical activity. The comment that was echoed by most of participants was: “there were no suitable rooms or fitness equipment for practicing PA effectively". Most of them stated that there was no sport specialist, except for in the first month in which some students from An-Najah University were available. While a few of them indicated that there was a male responsible for teaching them regular exercise, which is incompatible with the culture for female participants. Furthermore, some participants recommended the increase in number of exercise sessions to become twice a week, at least. As well, they suggested that a sport specialist must be present in each session in order to remind them about the previous exercises. On the other hand, some participants suggested the

inclusion of projectors or LCDs throughout the program as a teaching tool because they felt that this will help them to understand what is going on in their body, especially regarding the complications of diabetes. One participant commented: “I think that when we see the realistic pictures, this will increase our self-efficacy in maintaining diabetes-related behaviors”. Few participants also talked about pamphlets and brochures that could be introduced as a teaching tool. As one participant said: “I wish that the basic information which I learned were distributed on pamphlets because it may have provided me with a better reference once the program had finished". Furthermore, some participants suggested involvement of other healthcare providers like an endocrinologist. Finally, all participants expressed the wish for repetition of the program, or at least for conducting monthly follow-up sessions for them. They felt that this would provide them with an opportunity to increase their confidence to maintain behaviors and support each other.

4.5 Focus group with health care workers

To accomplish the last objective of progarm evaluation, focus qroups were conducted with HCWs who had been involved in program implementation in each clinic. Nine HCWs were invited and interviewed in focus groups. A semi structured interview was prepared in which four general questions were brought to discussion (Annex 5). The focus groups were taped recorded after appropriate consent, and terminated when the

discussion sufficiently covered the topic and no new information was emerging, which lasted for 20 minutes in each session.

The focus group started with an open question about HCWs' opinion of the program and how they invited the participants. HCWs reported that this kind of health educational program was implemented for the first time at UNRWA clinics. In general, the staff in all clinics pointed out the effectiveness of this program, although it was the first experience for them. They connected that success with the results which were observed either on biometric measurments or behaviour change for the participants. Regarding the invitations, qualitative results revealed that general invitations for diabetic patients was used in one clinic, while in others, staff nurses had chosen high risk patients who had high blood sugar,were obese, and were inactive to be invited by telephone calls or personally during their regular clinic visits.

A number of themes emerged during the discussion when the HCWs talked about their views of the program.The themes that were identified in this part of evaluation were:

1. The impact of program on participants
2. The reaction of the participants through the program
3. The strengths and weakness of the educational program
4. Challenges faced and suggestions to improve the program

1. The impact of program on participants

In response to the impact of the program on participants and their quality of life, all HCWs seemed to be convinced of the beneficial effects of this program. In addition to the improvements that were observed in their biometric measurements, HCWs felt that participants became able to take responsibility for their health. A dietitian reported that there are actual changes in participants' behavior in different areas after the program. Some participants adhered to recommended, planned, and controlled diet, while others to healthy cooking practices. Adherence to treatment, physical activity, and other aspects of self-care were also noticed in some participants at the end of program. One of them described: “really, I was surprised regarding participants’ acceptance for these new behaviors and their confidence to maintain their behavior in the future, especially for PA, which was neglected from them before the program". Other staff members reported that the participants gained new information about all aspects of diabetes and its related behaviors. As commented: “I noticed that some patients at the beginning of the program had had a history of diabetes for more than ten years and they did not know what diabetes was". Psychologists reported that enhanced psychological support by discussing stressors in the daily lives of patients helped them to have a positive effect on coping with and accepting the reality of diabetes among participants. One of them said: “their harmony in relaxation exercises are improved efficiently at the end of program”.

2. The reaction of the participants through the program

All staff members expressed their appreciation for participants' reactions in the program and they described it as excellent. One piece of evidence for this reaction as stated by HCWs is that participants were very motivated about attending the program, rarely missing a session; as well, dropout rate was very low in which only 6 participants out of 81 from all clinics left after one or two sessions and did not complete the program. One staff member commented: “although some participants are living far away from clinic, having transportation difficulties, and busy at work, almost all of them adhered to the weekly appointment in the clinic”. The second piece of evidence is participants' compliance with diabetes-related behaviors taught during the program. All HCWs felt that compliance of participants with these new behaviors were excellent and they had confidence to continue their established behavior in the future. As described by one of them, “participants’ lives were based on unhealthy behaviors for ten years and suddenly they have changed those practices. It is a surprise”. Other health workers pointed out that the participants have raised important questions during the sessions which indicate that they actively reacted with session contents. Furthermore, all staff nurses reported that the participants wanted to repeat the program for the second time.

3. The strengths and weakness of the educational program

Qualitative findings revealed a number of strengths and weaknesses of the current program that can be addressed. Most HCWs expressed their interest in working with the community and with people who have the same disease and they described this kind of work as very exciting. Nearly all of them agreed that the program was comprehensive in nature, encompassing all aspects of diabetes- related behaviors with a specific emphasis on topics regarding healthy eating, PA and socio-psychological aspects of diabetes. Also, some of them pointed out that the program was supported by a wide range of partner organizations, which facilitated implementing its activities. A few of them indicated that there was flexibility in implementing activities, which helped in the success of this program. As summarized, “we had the opportunity to choose participants, volunteers and the time of the program which was compatible with all participants". On the other hand, a wide range of opinions were expressed in regards to weaknesses of the program that need to be reviewed and overcome in the future. Firstly, one of the staff nurses reported that there was not enough time for invitation of participants. She said “we were informed about the campaign, and after a short time, the program was launched”. When staff nurses were asked about the low number of participants, which did not exceed 20 patients from each clinic, most of them stated that they invited the high risk patients who they viewed as most likely to be ready to attend as well as to change and maintain diabetes-

related behaviors. Others pointed out that the campaign was considered as a pilot study, so she invited a low number of participants. One of the staff members commented: “if we invited a large number of patients, only people the most committed to change would adhere to the program”. Another added: “All males who were invited declined to participate in addition to females who had children". Another weakness in the program which most HCWs talked about was the lack of commitment and support from other partners and volunteers who were supposed to implement most of the activities in the program. As described by one HCW, "volunteers participated in the first month only, which increased the workload on us". Additionally, the lack of sustainability was the most important weakness and defect in the program. As stated by most of them, “we now do not know anything about the participants and if they adhere to recommended behaviors or not".

4. Challenges faced and suggestions to improve the program

All HCWs experienced similar barriers and challenges in implementing health educational program for diabetic patients, which are summarized below. Staff members expressed greatest concern about the lack of enough cadres for implementing this kind of program, which has two strategies divided in to the medical part and community outreach activities. HCWs were actively involved in the program as an addition to their regular workload, which they found to be physically and psychologically stressful. Also, they felt a lack of support from some

partners for some of the activities in the program. The following statement is an example of this difficulty, which was noted by nearly all HCWs. “We had to shift between our daily work in the clinic and program sessions". A dietitian added: “I was responsible for four clinics during the program implementation, which was very exhausting”. Additionally, staff members talked about the lack of time; as some of them described: “in order to be more successful, this program needs the staff to devote their full day for its activities, which is impossible due to other work responsibilities in clinic”. Additional patients who wanted to participate one to two months after starting the program were unable to be accommodated, as stated by one of the staff who explained the reason as: “we decided to divide the participants to two groups: new and old, but were unable to do it because of a lack of staff and time". Sometimes there were disturbances in sessions, especially when participants had an appointment with the physician or they did lab tests during their regular visits to clinic, as one of them stated. Inadequate budget was one of the most important challenges that most staff mentioned. Most of them echoed that “the budget was acceptable, but we think it was not enough to fulfill all the program objectives". Finally, a lack of designated spaces for exercise and cooking sessions was also mentioned by a majority of HCWs as obstacles to perform these activities effectively.

When it comes to ideas about improving the program, there were several ideas from HCWs. All staff members agreed on the necessity to

provide suitable spaces either in the clinics or in the local community to implement program activities, especially for physical activity. One of them commented: “the place was not comfortable and not specialized either for meetings or cooking sessions and exercise sessions". Additionally, they suggested increasing the budget of the program in order to provide more entertainment activities such as picnics, awards and other incentives to increase the participation rate. In regard to teaching methods, one of them suggested to devote a full day for all activities which are distributed among all HCWs. Another one suggested providing pamphlets and brochures for the participants to be a reference once the program had finished. She also added: “another idea is to ask those participants to educate other patients in the community in the future, which can be of better use because they will share their expertise with their peers”. Another improvement the HCWs talked about was in the availability of transportation, especially for those who are living outside the camps. Finally, all HCWs suggested conducting monthly follow-up sessions for participants in order to enforce their established diabetes-related behaviors and to monitor their progress. Also, one of them suggested that it could be better if follow up visits were done by the health education department in Jerusalem during the program implementation to monitor the possible challenges and to encourage the participants to maintain their attendance.

Chapter Five

Discussion

5.1 Socio-demographic profile of participants and non-participants

5.2 Impact of DEP on participants' biometric measurements, knowledge and practice

5.3 Challenges faced and suggestions to improve the program

5.4 Implications for Public Health

Chapter Five

Discussion

The overall goal of the UNRWA campaign was to help Palestine refugees to prevent and control diabetes. As previously outlined, program evaluation is an important tool in public health programs to measure their effectiveness in reaching their target population, while also meeting program objectives. This study was conducted with the aim of evaluating the effectiveness of the “Life is Sweeter with Less Sugar” diabetes care program applied at UNRWA clinics in the North West Bank. Program evaluation will give stakeholders the necessary data and recommendations to make modifications to the program that may result in better outcomes for their patients.

The results of this study will be discussed from multiple perspectives; firstly, the socio-demographic profile of participants and non-participants will be analyzed. Secondly, impact of the program on participants in regard to their biometric measurements, KAP and other diabetes-related behaviors will be discussed. Thirdly, barriers and difficulties which were faced during program implementation as well as the suggestions raised for improvements of some aspects of the program to be more effective in the future from participants and HCWs’ point of view will be presented, and finally, cost-effectiveness of that program.

5.1 Socio-demographic profile of participants and non-participants

A total of 75 diabetic patients participated in the DEP at four UNRWA clinics. The study showed that almost all participants were females and unemployed, a finding which is consistent with other studies [43,48,62] with significant differences between participants and non-participants. This is expected, since unemployed females more frequently use health clinics, and so have more time to participate in educational programs than males. This is consistent with what has been shown in a study conducted in Canada by Temple B, et al. (2009) [48] that found that the majority of participants (59.7%) were retired. On the other hand, this finding is consistent with non-attendees' point of view, where the most common reason cited for non-attendance was being too busy and difficulty in getting time off work to attend, which agrees with other studies [48,49]. This view also explains the lower level of participation by the men in the DEP where almost all of men who did not participate were employed.

As noted from the survey, the mean age for the participants was 49.8(±7.6) years old which agrees with Rashed O. (2012) [54], while the mean age for non-participants was 56.0(±9.3) years (p=0.000). Younger patients were more likely to participate in DEP. This difference might be due to the fact that the mean age of participants represent the age of onset of type II diabetes. In addition, younger patients often were likely to be more concerned with their health as new sufferers of diabetes, and thus

more likely to attend and participate in educational programs than older patients.

Another variable identified among participants was the place of residents, where the majority was living in refugee camps (51.2 %). This could be attributed to the fact that all UNRWA clinics are inside or nearby the refugee camps and most of the clinics' clients are from these camps. This is consistent with the fact that physical accessibility of the health care centers is an important determinant of the uptake of its services.

The survey findings also showed that more than half of participants had a low level of education. This finding is consistent with other studies [54,63] that found that a majority of participants did not study beyond secondary school. Torres C, et al. (2009) [36] also showed that 79% of participants of his study had elementary school or less. This result could be due to the predominance of females among participants. Females often marry before completing secondary school, and so most of them are housewives and unemployed [64].Of all women who got married in 2009 in Palestine, about 22.9% were under the age of eighteen years compared with 0.8% for males [64].The economic climate among refugee population with no education and little prospect of a job, make girls a financial burden in many families. Therefore, an early marriage makes some solution for families to deal with poverty. It is obviously that there is an association between educational level and participation in the program; participants who had low level of education were more likely to participate in DEP

compared with more educated participants. This result may be due to the fact that those of a higher educational level have a greater probability of obtaining knowledge from books and other sources such as mass media [53]. Abdo NM, et al. (2010) founds that knowledge related to disease improved with a corresponding increase in the level of education and socioeconomic status and with working status [53]. On the other hand, barriers to attendance identified in the survey may explain this association as the most common reason cited was being too busy and time was not suitable. Thus, if the program was conducted in a time suitable for those who are employed, then a higher percentage from the high education group would be expected to participate.

5.2 Impact of DEP on participants' biometric measurements, knowledge and practice

DEPs are complex interventions and assessing the effect of its various components separately is difficult [65]. However, the most frequently listed indicators for measuring the outcomes at the service levels were clinical measurements, knowledge scores, self-management behavior scores, psychological adjustment which describe quality of life, and, finally, optimal cost-effectiveness [66,67].

The study results demonstrated that the six-month DEP was an effective approach in improving anthropometric measurements among diabetic patients (Table 2). Similar findings have been reported in other

studies [43,52] where patient education on lifestyle modifications resulted in decreased body weight, BMI, and WC. This outcome is a good indicator for program effectiveness because such measures generally show an improvement only after a prolonged period of education according to the literature [35,36] .The findings also revealed that after DEP, a statistically significant improvement in BG level was observed (Table 3). This result is in accordance with other studies [52,53,54]. On the other hand, other clinical outcomes such as lipid profile, systolic and diastolic BP were not improved significantly which is consistent with other studies [52,55]. Moreover, in a systematic review involving twenty two interventional studies, the more frequent improvements after educational programs were in fasting BG, HbA1c and BP, than other clinical outcomes such as lipid profile, weight/BMI, or WC [47].

Patient education constitutes a cornerstone in the management of diabetes. Knowledge regarding diabetes forms the basis for informed decisions about diet, exercise, use of medications, foot and eye care, and control of risk factors [40]. Although the acquisition of knowledge does not necessarily translate into a change in behavior [63], a significant improvement in participants ‘weight/BMI and post-prandial BG reflects that the changes that occurred in the participants’ knowledge towards diabetes were effective in changing patients' behavior regarding diabetes into a more healthy one, which is similar to that found by others [51,53].

The current study showed that by the end of the program, the majority of the participants (80.4%) had a good level of knowledge regarding different aspects of diabetes (Table 7). This finding is consistent with participants' point of view where almost all of them reported that they gained new information that pertained to all aspects of diabetes and its related behaviors. Other studies also showed an improvement in knowledge on diabetic patients after DEPs [54,55]. On the other hand, participants' knowledge regarding periodic eye and foot examination was found to be poor (21.4% and 44.6% of participants with correct answers respectively), which highlights the need for these aspects to be focused on in the future DEP.

Concerning medications, it should be pointed out that adherence to treatment is an important aspect in controlling diabetes [53]. Our study revealed a significant increase (p value <0.001) in mean scores of medical adherence after the educational program, where 81.3% of the participants showed high adherence.

Changes in eating behavior and the practice of PA in diabetic patients are very important in the evaluation of group education programs in diabetes, and are subject to the improvement of knowledge and the modification of attitudes about the disease [36]. Attitude toward PA in participants was found to be favorable in the majority with significant differences after the program, which is in accordance with a study by Abdo NM. (2010)[53].This finding is consistent with HCWs'point of view who

were surprised regarding participants' acceptance of PA and their confidence to maintain it in the future. As evidence from survey results, practicing regular exercise three times weekly for 35 min improved significantly (p value <0.001) after the program (Table 5), which agrees with a study by Atak N. (2009) [51].This indicates that participants may have been beginning to understand the importance of disease management. However, it was found that their self-reported practices need to be improved (Table 8). Compliance with medication, dietary and PA advice can only be improved by spending more time on individual education and by the availability of appropriate teaching material [30]. Therefore, there is a need for dietitians to spend more time with diabetic patients.

Making healthy food choices, understanding portion sizes, and learning the best times to eat are central to managing diabetes [67]. Participants' positive experience in adopting these behaviors are in accord with findings from similar programs [68,69]. Quantitative data also revealed that overall scores of the participants regarding dietary behaviors were significantly (P value <0.001) higher at the end of the program (Table 6).However, compliance to routine dietary modifications was reported in 43% of participants, which can be explained by the fact that some participants in FGDs reported that they did not change due to their families' rejections. Family support has been described as an essential factor for stimulating the self-care of patients with DM [64].The program, however,

must provide perceived social support to patients so that they will feel their self-management is worthwhile.

Psychological well-being is an important goal of diabetes management. It is considered an important outcome measurement that should be routinely examined in clinical trials concerning evaluation of patient education [66,67]. The findings of this study support this suggestion. In particular, qualitative findings highlighted that the group sessions were seen as helpful in reducing stress. HCWs felt that discussing stressors in the daily lives of patients had a positive effect on coping with, and accepting the reality of diabetes among participants, which is similar to other studies [69,70].

5.3 Challenges faced and suggestions to improve the program

It was encouraging to note that the participants' evaluation for the program was very positive. The qualitative results revealed that most participants rated the quality of the DEP at UNRWA clinics as excellent and that it was worth their time. This finding is consistent with HCWs' points of view. They stated that the participants were very motivated about attending the program and rarely missed a session, which agrees with the findings of a study by Potter AR. (2013) [68]. Our study contradicts the results of a Saudi Arabian study conducted to evaluate a DEP at a primary health care center, where the sessions were poorly attended by invited

participants, which could be attributed to deficiencies in the essential structures of the program [30].

However, although all participants stated that almost all their needs had been met, a wide range of challenges were expressed. The participants and HCWs share mostly the same view regarding the challenges faced during program implementation. They stated a lack of designated spaces for exercise and cooking sessions as the main challenge. They also agreed that a lack of sustainability was the most important weakness in this program, which could be improved by conducting monthly follow-up sessions in order to monitor progress, as stated by both participant groups. This is similar to findings found in a qualitative study conducted in New Zealand [69]. Moreover, a systematic review involving thirty one interventional studies concluded that although self-management training improved diabetes control at immediate follow-up, the benefit declined between one and three months after the intervention ceased, suggesting that learned behaviors can change overtime[33].

Barriers to attendance identified in the survey were most likely to include a lack of advertising for the program, in that87.5% of patients reported that they had never heard of the program (Table 9). This is similar to the findings of a survey conducted in 2006 in the USA to evaluate the barriers to participation in DSME programs, which found that the patients did not know enough about these programs [49]. This finding is also consistent with participants' point of view that the invitation could be

improved which highlights the need for advertising for this kind of program in the future. On the other hand, HCWs explained the low participation rate in this program in that the campaign was considered as a pilot study and they invited only the high risk patients who they viewed as the most likely to be able to attend as well as to change and maintain their diabetes-related behaviors. In addition, time of program and interference with work schedules were common barriers documented and are important impetus for change to the DEP structure.

The study results revealed that all participants agreed that it was necessary to introduce additional entertainment activities to motivate them to continue attending. They suggested also improving teaching tools by inclusion of projectors or LCDs throughout the program. This finding is in accordance with HCWs' point of view, who indicated that the budget was not enough to fulfill all the program objectives, and if it was more, the outcome would be more effective.

All HCWs involved in program implementation shared mostly the same difficulties during program implementation. They mentioned a lack of enough cadres and a lack of time for implementing this kind of program, which they found to be physically and psychologically stressful. Another difficulty was the lack of commitment and support from other partners and volunteers who were supposed to implement most of the activities in the program. This is similar to difficulties found in a study conducted in South Africa, as a lack of time and the high workload were considered the main

threats [38]. Furthermore, a lack of vital resources, such as time, place, and material were the main challenges found in a study conducted in Finland[71].

On the other hand, HCWs had very different ideas in regard to improving aspects of program itself. They suggested providing pamphlets and brochures for the participants to be a reference once the program had finished. Another suggestion was to make available transportation, especially for those who are living outside the camps, which agrees with Balamurugan A. et al (2006) [72] who found that the transportation issue was an important barrier at the patient-level. Finally, they suggested that the health education department in Jerusalem conduct follow-up visits to monitor the possible challenges and to encourage the participants to maintain their attendance. This is consistent with what was shown in a study conducted in Arkansas in the USA, in which the stakeholders and partners who established the DSME program held a monthly teleconference with the DSME program staff to discuss progress and barriers experienced at both program and patient levels [72].

5.4 Implications for Public Health

The ever-increasing cost of diabetes care is a challenge at UNRWA [73]. In the last ten years, the number of patients with diabetes and high BP at UNRWA's 139 clinics has more than doubled rising from 104,742 in 2002 to 211,533 in 2011 [28]. The Agency was treating over 200,000

patients with diabetes and or high BP per year, and spending 41 percent of its medication budget on drugs to treat the two conditions [28]. These calculations include only the direct treatment cost of the disease and not including indirect cost of disability, unemployment and premature death. DEP applied at UNRWA clinics is an important tool for managing DM and costs associated with it. Although no data is available on the cost of DEP applied at UNRWA clinics, its prevention efforts may be preventing further costs to the health care system at UNRWA. The findings indicate that the benefits associated with education on self-management and lifestyle modification for diabetic patients are positive and outweigh the costs associated with the intervention. More research is needed to validate that diabetes education provided by diabetes educators is cost-effective.

Limitations of the study

Several limitations should be considered when interpreting the results of this study. First, the UNRWA campaign was considered as a pilot study in which the validity of the UNRWA survey has not been tested. However, ongoing program evaluations are needed to confirm validity of evaluation tools. In addition, the invitation and selection method of participants might have created bias toward positive effects since patients who attend the clinic are those who usually care about their health. Therefore, overestimation may have occurred. As well, sample size may have been a limiting factor, which was not representative of diabetic patients at UNRWA clinics; therefore, our findings might not be

generalized to the larger population. Second, the short monitoring period for evaluating the DEP (effects were only measured directly after the last class) should have been longer than 12 months to better evaluate the effect of it. However, if the monitoring period had been increased, the numbers of drop-outs would have increased. Third, the lack of a control group to make comparison and to ensure that the effect observed was due to the DEP and not to other confounding factors was a limitation. This is because the program had already been started and completed during the data collection phase. Finally, no glycemic control data (HbA1C) were obtained, which could be a predictor for future complications. If such information had been available, then we would have been able to link knowledge and behavioral changes with glycemic control.

5.5 Conclusion and Recommendation

The goal of the UNRWA campaign was to help Palestine refugees to prevent and control diabetes. Overall, the results of this evaluation indicate thatthe UNRWA campaign was effective in meeting most of its objectives for improving diabetes self-management behaviors. The majority of the participants at the end of the program had a good level of knowledge regarding different aspects of diabetes and its related behaviours. Participants were able to identify foods that raised BG levels as wellas demonstrate an understanding of the importance of following a controlled and planned diet. Attitude and practice toward PA was also found to be favorable in the majority of participants as evidencedin survey results.In

terms of disease management, participants not only understood theimportance of routine medical care to manage complications from diabetes, but theyalso put this knowledge into practice as evedincedin biometric measurements in which weight/BMI, WC and BG improved significantly at the end of the program.This was not without challenges where the participants and HCWs reported a lack of designated spaces for exercise and cooking sessions as the main challenge. They also agreed that a lack of sustainability was the most important weakness in this program. There was a strong interest in future DEPs, if additional entertainment activities were introduced. The interviews with HCWs revealed that the lack of enough cadres, time,and commitment from other partners and volunteers who were supposed to implement most of activities were the main difficultites, reported by almost all of them.

According to the results of the evaluation; several recommendations are suggested to improve the diabetes care program at diabetic clinics in the future:

Recommendation for UNRWA:

1. To continue its strategy in improving management of diabetes to combat this growing problem in the Palestine by conducting frequent educational programs to increase awareness among diabetic patients.

2. Improving teaching tools in DEP by including LCDs, and providing pamphlets which will serve as a reference once the program has finished. As well, increase options for times DEP offered.

3. Enough cadres and staff should be available for implementing this kind of program, covering all activities.

4. Improving participant invitation through different forms of advertising for the educational program and introducing additional entertainment activities to motivate participants to continue attendance.

5. Suitable spaces should be available either in the clinics or in the local community to implement program activities effectively, especially for physical activity.

6. Building ongoing partnerships with academic institutions through putting plans for possible future cooperation that have large impact on program effectiveness as well as on students ‘learning.

7. Raising community awareness and social support for diabetic patients through designing family programs that have potentially important positive influence on patients’ self-management.

8. Long-term follow-up sessions should be conducted monthly after the end of the program so as to boost and maintain those behavioral changes which were already established.

9. Finally, we advise the health education department in Jerusalem to conduct follow up visits and supervision during the program implementation to monitor the possible challenges and to encourage the participants to continue attending.

Recommendation for the MOH:

1. To adopt diabetic health education programs in the primary health care centers that are involved in diabetes care to improve their quality of life and reduce the associated medical costs.

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Appendices

Annex I: UNRWA Survey

رقم المشترك	Code:	نوع الاستبيان: ☐ قبلي	☐ بعدي
إسم المشارك:		إسم المركز الصحي:	
الجنس:	☐ ذكر	☐ أنثى	
تاريخ الميلاد:	----------	Height: ----------	

Monthly basis	Month 1	Month2	Month 3	Month 4	Month 5	Month 6
Weight (Wt),						
WC						
PPBG						
BP						
Cholesterol **(first and last month only)**						

عزيزي المشارك، عزيزتي المشاركة :نود أن نعلمك بأن جميع المعلومات التي ستدلي بها في هذا الاستبيان**ستبقى** سرية ولن تستخدم إلا لدراسة دوراتنا التثقيفية والتدريبية من اجل تطويرها وتقديم خدمات افضل لكم في المستقبل

نرجو الإجابة على جميع الأسئلة التالية بوضع علامة (√) أو ملء الفراغات في الأماكن المناسبة:

	معلوماتك عن حالتك المرضية			
1	هل أنت مصاب بالسكري	☐ نعم	☐ لا	
2	نوع السكري لديك	☐ النوع الاول	☐ النوع الثاني	
3	هل انت مصاب بارتفاع ضغط الدم؟	☐ نعم	☐ لا	
4	هل أنت مدخن؟	☐ نعم	☐ لا	
	لستخدم الدواء			
1	هل تنسى أحيانا أن تتناول الدواء الخاص بالسكري؟	☐ نعم	☐ لا	

2	عند الشعور بأعراض جانبية من الدواء فهل تتوقف عن تناوله؟	☐نعم	☐لا		
3	هل تعتقد أن الالتزام بأخذ أدوية السكري يساعد بأن يبقى السكر بالدم ضمن الحدود الطبيعية؟	☐نعم	☐لا		
4	هل تعتقد أن تفويت بعض الجرعات من العلاج الذي تتناوله لن يسبب أي مشكلة؟	☐نعم	☐لا		
5	هل تهمل في تناول الدواء في بعض الأحيان؟	☐نعم	☐لا		
6	هل تحاول الالتزام بأخذ دواء السكر بحسب إرشادات الطبيب؟	☐نعم	☐لا		
معلومات عامة عن مرض السكري					
1	قراءة السكر في الدم من 130-180 بعد ساعتين من الطعام تعتبر طبيعية	☐نعم	☐لا	☐غير متأكد	
2	السكري مرض يمكن الشفاء منه	☐نعم	☐لا	☐ غير متأكد	
3	من الضروري عمل فحص دوري لنسبة السكر في الدم حتى في حال عدم وجود تشخيص للمرض	☐نعم	☐لا	☐ غير متأكد	
4	من مضاعفات السكري (امراض الكلى)	☐نعم	☐لا	☐ غير متأكد	
5	من مضاعفات السكري (اعتلال شبكية العين)	☐نعم	☐لا	☐ غير متأكد	
6	من مضاعفات السكري (امراض القلب)	☐نعم	☐لا	☐ غير متأكد	
النشاط البدني					
1	الأشخاص النشطاء بدنيا أكثر صحة وأقل احتمال للإصابة بمرض السكري	☐نعم	☐لا	☐ غير متأكد	
2	أحاول الإكثار من النشاط البدني	☐نعم	☐لا	☐ غير متأكد	
3	.يوجد رصيف للمشي في منطقتي	☐نعم	☐لا	☐ غير متأكد	
4	النشاط البدني مقبول في مظلقتي	☐نعم	☐لا	☐ غير متأكد	
5	هل تمارس رياضة لمدة 20 دقيقة	☐نعم	☐لا	☐ غير متأكد	

	مثل الاعمال المنزلية يوميا				
6	هل تمارس رياضة المشي لمدة 35دقيقة على الاقل 3مرات في الأسبوع	☐نعم	☐لا	☐ غير متأكد	

نمط الحياة الغذائي

1	برأيك ماهي أفضل الطرق لطهي الطعام؟	☐ قلي	☐ سلق	☐ شوي	☐ متنوع	☐ لا أعلم
2	برأيك ما هي أفضل أنواع الزيوت و الدهون المستخدمة في لطهي الطعام:					
	☐ سمن او زبدة	☐ زيت عباد الشمس	☐ زيت ذرة	☐ زيت زيتون	☐ لا أعلم	
3	متى تقوم بإضافة الملح على الطعام	☐ قبل تذوق الطعام	☐ بعد تذوق الطعام	☐ لا أضيف الملح		
4	برأيك كيف يمكن تقدير كمية الزيوت او الدهون المضافة للطعام خلال الطبخ	☐ باستخدام ملعقة للمعيار	☐ بالتقدير دون معيار معين (بالعين)	☐ لا أعلم		
5	كم عدد الوجبات التي تتناولها باليوم؟					
	☐ وجبة واحدة	☐ وجبتان	☐ ثلاث وجبات	☐ أربع وجبات	☐ 5-6وجبات	
6	اذا كنت تتناول اكثر من وجبة في اليوم اجب على السؤالين التاليين:					
	متى تتناول اول وجبة باليوم	☐ 6-8 صباحا	☐ 8-10 صباحا	☐ 10صباحا- ظهرا12	☐بعد 12 ظهرا	
	متى تتناول أخر وجبة باليوم	☐ 4-6 عصرا	☐ 6-8 مساءا	☐ 8-10مساءا	☐ بعد 10 مساءا	
7	هل تتناول اطعمة أثناء مشاهدتك التلفاز آو الكمبيوتر؟					
أ	☐ لا اتناول أي طعام اثناء مشاهدتي التلفاز او الكمبيوتر					
ب	(نعم) إختار جميع ما ينطبق	☐ مكسرات	☐ شوكلاتة	☐ بوشار	☐ شيبس	☐ خضار

المعلومات الغذائية

8 برأيك أي من الأغذية التالية تأثر ايجابيا أو سالبيا على مريض السكري (ضع علامة (√) في الفراغ)

نوع الأغذية						
* الخضروات						
*الدهون والزيت الزائدة						
*زيت الزيتون بكميات كبيرة						

*كميات كبيرة من (أرز ، بطاطا ، خبز)							
*البقوليات والحبوب بكميات محددة							
*العصائر المحلاة							
*الحلويات							
*الصودا							

نهاية الأسئلة

Annex II: KAP Questionnaire

جامعة النجاح الوطنية

كلية الدراسات العليا

2014

استمارة بحث حول " تقييم برنامج التثقيف الصحي لمرضى السكري في عيادات وكالة الغوث في شمال الضفة الغربية "

أخي/أختي مريض/ة السكري

السلام عليكم ورحمة الله وبركاته،،،،

أنا رنا داود عبدالله أبو سمره طالبة ماجستير في قسم الصحة العامة بجامعة النجاح الوطنية، أقوم بعمل دراسة تهدف إلى تقييم برنامج التثقيف الصحي لمرضى السكري تحت عنوان: "الحياة أحلى مع سكر أقل" المتبع في عيادات وكالة غوث وتشغيل اللاجئين الفلسطينيين "الأونروا" في مخيمات شمال الضفة الغربية. تتكون الاستمارة من قسمين، بعض المعلومات الديموغرافية (العمر، التعليم وغير ذلك)، ومعلومات مرضية وغذائية. لذا نأمل منكم المشاركة الفاعلة والتعاون في تعبئة هذه الاستمارة والإجابة على تساؤلاتها بدقة وموضوعية. مؤكدين اقتصار استخدام المعلومات الواردة في هذه الاستمارة على أغراض البحث العلمي وسيتم التعامل معها بمنتهى السرية والخصوصية والأمانة، ولا داعي لذكر الاسم في تعبئة هذا الطلب.

(شاكرون لكم حسن التعاون)

الطالبة: رنا داود عبد أبوسمره

جامعة النجاح الوطنية

ماجستير صحة عامة

" استمارة بحث حول " تقييم برنامج التثقيف الصحي لمرضى السكري في عيادات وكالة الغوث في شمال الضفة الغربية "

القسم الأول:

بيانات خاصة بالمريض:

1. **الجنس:** ☐ ذكر ☐ أنثى
2. **العمر:** .....
3. المستوى التعليمي: ☐ أمّي ☐المرحلة الابتدائية- الإعدادية ☐المرحلة الثانوية ☐ الجامعية
4. المهنة:.....
5. مستوى دخل الأسرة الشهري: ☐ قليل ☐ متوسط ☐عالي
6. الحالة الاجتماعية: ☐ أعزب ☐ متزوج ☐ أرمل
7. **مكان الإقامة:** ☐ قرية ☐ مدينه ☐ مخيم
8. **نوع المرض(السكري):** ☐سكري من النوع الأول ☐سكري من النوع الثاني
9. **مدة المرض:** ☐أقل من سنة ☐من 1-4 سنة ☐ من 5-10 سنة ☐أكثر من 10سنوات
10. **مدخن:** ☐ نعم ☐ لا
11. **الأمراض المزمنة :** .....
12. ما هو مجموع الأدوية التي تتناولها في اليوم الواحد لعلاج جميع الأمراض لديك مع ذكرها إن أمكن:

.....
.....
.....
.....

القسم الثاني:

الاختبار التقويمي المتعلق بمدى معرفة مريض السكري بالمرض والإعتقاد به وكيفية التعامل معه(بعدي):

1. مرض السكري هو حالة من:
(أ) ارتفاع مستوى السكر بالدم **(ج) انخفاض مستوى السكر بالدم**
(ب)ارتفاع مستوى الدهون بالدم **(د) لاأعرف**

2. يعتبر مرض السكري من:
(أ) الأمراض المعدية **(ج) الأمراض المزمنة**
(ب) الأمراض التي يمكن الشفاء منها **(د) لاشيء مما ذكر**

3. أنواع السكري:
(أ) النوع الأول هو المعتمد على الأنسولين (ج)سكري الحمل
(ب) النوع الثاني غير المعتمد على الأنسولين (د) جميع ما ذكر

4. من علامات ارتفاع السكر بالدم:
(أ) كثرة التبول (ج) الكلل العام
(ب) العطش والجوع (د) جميع ما ذكر

5. من العوامل التي تزيد من احتمال الإصابة بالسكري من النوع الثاني:
(أ) الزيادة في الوزن أو السمنة (ج) الضغوط النفسية
(ب)قلة النشاط البدني (د) جميع ما ذكر

6. من المهم عمل فحص دوري لنسبة السكر في الدم حتى في حال عدم وجود تشخيص للمرض:
(أ) نعم (ب) لا (ج) لا أعرف

7. يؤثر عدم ضبط السكر في الدم إلى حدوث مضاعفات في الأعصاب والكلى والعيون:
(أ) نعم (ب) لا (ج) لاأعرف

8. من العوامل التي تساعد على ضبط مستوى السكر في الدم:
(أ) تناول الأدوية الخافضة للسكر (ج) التنظيم الغذائي
(ب) ممارسة الرياضة اليومية (د) جميع ما ذكر

9. المراجعة الشهرية لعيادة السكري:
(أ) لا تساعد في علاج المرض المضاعفات (ج) ليست ضرورية للاكتشاف المبكر
(ب) تساعد في التقليل من المضاعفات (د) لاشيء ما ذكر

10. إن ممارسة الرياضة بانتظام تؤدي إلى:
(أ) تحسين الدورة الدموية في الجسم (ج) تخفيض مستوى السكر في الدم
(ب) تعزز من عمل الأنسولين في الجسم (د) جميع ما ذكر

11. ينصح مريض السكري بتوزيع ما يتناوله من الوجبات:
(أ)وجبتان رئيسيتان منتظمتان (ج)ست وجبات منتظمة
(ب) وجبة واحدة (د) لا يهم عدد الوجبات ولاتوقيتها

12. إن الهدف من التنظيم الغذائي هو:
(أ)ضبط مستوى السكر في الدم (ج) الوقاية من المضاعفات
(ب) الحصول على الوزن الطبيعي (د) جميع ماذكر

13. من الأغذية الواجب تجنبها لدى مريض السكري:
(أ) السكريات مثل العصائر والحلويات (ج) البقوليات والحبوب بكميات محددة
(ب) الخضروات والفواكه (د) لاشيء مماذكر

14. إن التقليل من ملح الطعام والأطعمة المملحة:
(أ) لا يساعد في الوقاية من المضاعفات (ج) لاشيء مما ذكر
(ب) يساعد في الوقاية من المضاعفات (د) لا أعرف

15. إن التقليل من القهوة والإقلاع عن التدخين:
(أ) لا يساعد في الوقاية من المضاعفات (ج) لاشيء مما ذكر
(ب) يساعد في الوقاية من المضاعفات (د) لا أعرف

16. على مريض السكري عمل فحص دائم لقاع العين:
(أ) مرة كل شهر (ج) مرة كل سنة
(ب) مرة كل ستة أشهر (د) لا داعي لعمل فحص

17. على مريض السكري عمل فحص دائم للفم:
(أ) مرة كل شهر (ج) مرة كل سنة
(ب) مرة كل ثلاثة أشهر (د) لا داعي لعمل فحص

18. من علامات هبوط السكر في الدم:
(أ) التعرق الشديد (ج) تسارع ضربات القلب
(ب) الرجفان (د) جميع ما ذكر

19. يتم التعامل مع أعراض هبوط السكر في الدم عن طريق:
(أ) تناول الدواء (ج) أخذ الأنسولين
(ب) تناول السكريات (د) لاشيء مما ذكر

20. متى تم إجراء عمل فحص لضغط الدم لديك آخر مرة:
(أ) قبل شهر (ج) قبل ستة أشهر
(ب) قبل شهرين (د) لم تفعله كليا

21. متى تم إجراء عمل فحص لقاع العين لديك آخر مرة:
(أ) قبل شهر (ج) قبل سنة
(ب) قبل ستة أشهر (د) لم تفعله كليا

22. هل تمارس الرياضة بانتظام:
(أ) نعم (ب) لا
إذا كانت الإجابة بنعم فمتى:
(أ) كل يوم (ج) مرتان بالأسبوع
(ب) مرة بالأسبوع (د) مرة بالشهر

23. هل تتبع حمية غذائية منتظمة:
(أ) نعم (ب) لا
إذا كانت الإجابة بنعم فمتى:
(أ) دائما (ج) نادرا
(ب) أحيانا

24. هل تنسى تناول الدواء في بعض الأحيان:
(أ) نعم (ب) لا

25. هل تحافظ على الالتزام بمواعيد العيادة والتعليمات الطبية:
(أ) نعم (ب) لا

Annex III: Non-participants Questionnaire

جامعة النجاح الوطنية

كلية الدراسات العليا 2014

استمارة بحث حول " أسباب عدم حضور مرضى السكري لبرنامج التثقيف الصحي في عيادات وكالة الغوث في شمال الضفة الغربية"

أخي/أختي مريض/ة السكري

السلام عليكم ورحمة الله وبركاته،،،،

أنا رنا داود عبدالله أبو سمره طالبة ماجستير في قسم الصحة العامة بجامعة النجاح الوطنية، أقوم بعمل دراسة تهدف إلى تقييم برنامج التثقيف الصحي لمرضى السكري تحت عنوان: "الحياة أحلى مع سكر أقل" المتبع في عيادات وكالة غوث وتشغيل اللاجئين الفلسطينيين "الأونروا" في مخيمات شمال الضفة الغربية. لذا نأمل منكم المشاركة الفاعلة والتعاون في تعبئة هذه الاستمارة والإجابة على تساؤلاتها بدقة وموضوعية. مؤكدين اقتصار استخدام المعلومات الواردة في هذه الاستمارة على أغراض البحث العلمي وسيتم التعامل معها بمنتهى السرية والخصوصية والأمانة، ولا داعي لذكر الاسم في تعبئة هذا الطلب.

(شاكرون لكم حسن التعاون)

الطالبة: رنا داود عبد أبوسمره

جامعة النجاح الوطنية

ماجستير صحة عامة

استمارة بحث حول" أسباب عدم حضور مرضى السكري لبرنامج التثقيف الصحي في عيادات وكالة الغوث في شمال الضفة الغربية"

القسم الأول:

بيانات خاصة بالمريض:

1. **الجنس:** ☐ ذكر ☐ أنثى
2. **العمر:** .....
3. المستوى التعليمي: ☐ أمّي ☐المرحلة الابتدائية- الإعدادية ☐المرحلة الثانوية ☐ الجامعية
4. المهنة:.....
5. مستوى دخل الأسرة الشهري: ☐ قليل ☐ متوسط ☐عالي
6. الحالة الاجتماعية: ☐ أعزب ☐ متزوج ☐ أرمل
7. **مكان الإقامة:** ☐ قرية ☐ مدينه ☐ مخيم
8. **نوع المرض(السكري):** ☐سكري من النوع الأول ☐ سكري من النوع الثاني
9. **مدة المرض:** ☐أقل من سنة ☐من1-4 سنة ☐ من 5-10 سنة ☐ **أكثر من 10سنوات**
10. **مدخن:** ☐ نعم ☐ لا
11. **الأمراض المزمنة :** .....
12. ما هو مجموع الأدوية التي تتناولها في اليوم الواحد لعلاج جميع الأمراض لديك مع ذكرها إن أمكن:

.....
.....
.....
.....

القسم الثاني:

الأسئلة التي حالت دون حضور البرنامج:

1. **كم مرة تأخذ دواءك في اليوم:** ☐ مرة واحدة ☐مرتان ☐ ثلاث مرات ☐ أربع مرات
2. برأيك ما هو **السبب الأساسي الذي يدفعك لعدم أخذ الأدوية** طبقا لتعليمات الطبيب

- لا أعتقد حقا انه يحسن حالتي الصحية
- لأنه يسبب لي أعراض جانبية غير مرغوبة

- الألم الناتج عن الحقنة
- احافظ على أخذ الدواء باستمرار

3. معدل زيارتك للطبيب من أجل علاج مرض السكري:

- كل شهر
- كل شهرين
- كل ثلاث أشهر
- كل 4 إلى 6 شهور
- لا أقوم بزيارة معتدلة للطبيب
- أقوم بزيارة الطبيب فقط عند الحاجة

4 . سبب عدم المتابعة مع الطبيب وزيارة العيادة:

- أحافظ على معدل السكر بالدم عن طريق الحمية
- لأنه غير مهم
- لا أؤمن بالأدوية
- لعدم قدرتي على توفير تكاليف زيارة العيادة
- معاملة موظفي العيادة لا تعجبني

5. خلال الستة أشهر الماضية هل تم دعوتك لبرنامج التثقيف الصحي في العيادة:

1. نعم 2. لا

6. إذا كانت الإجابة بنعم، فماهي هي الأسباب التي حالت دون حضورك ومشاركتك في البرنامج:

- لست بحاجة إلى مساعدة
- أحتاج إلى طبيب فقط لإدارة المرض
- الانشغال الشديد في العمل
- صعوبة في الحصول على إجازة من العمل
- صعوبة في المواصلات
- النسيان
- وقت البرنامج غير مناسب بالنسبة لي
- لا أرى أي فوائد صحية من حضور البرنامج
- أمور صحية أخرى أكثر أهمية

7. هل يوجد أسباب أخرى لديك حالت دون مشاركتك في البرنامج:

.....

.....

.....

Annex IV: Focus group for the participants

1. **مستوى الرضى:**
   - جودة البرنامج من وجهة نظرك: ممتاز، جيد، غير جيد؟
   - مستوى فهمك للمعلومات الموجودة في البرنامج: مفهوم جدا، على الأغلب، او على الإطلاق؟
   - الدرجة التي حقق فيها البرنامج حاجة المريض: معظم احتياجاتي، فقط عدد قليل، غير ذلك....؟

2. **الآراء والخبرات:**
   - هل تشعر بأن البرنامج يستحق وقتك؟
   - ماهي أهم الأشياء التي تعلمتها في البرنامج والتي تمارسها أكثر؟
   - ماهو الجزء الذي أعجبك أكثر في البرنامج وماهو الجزء الذي لم يعجبك؟

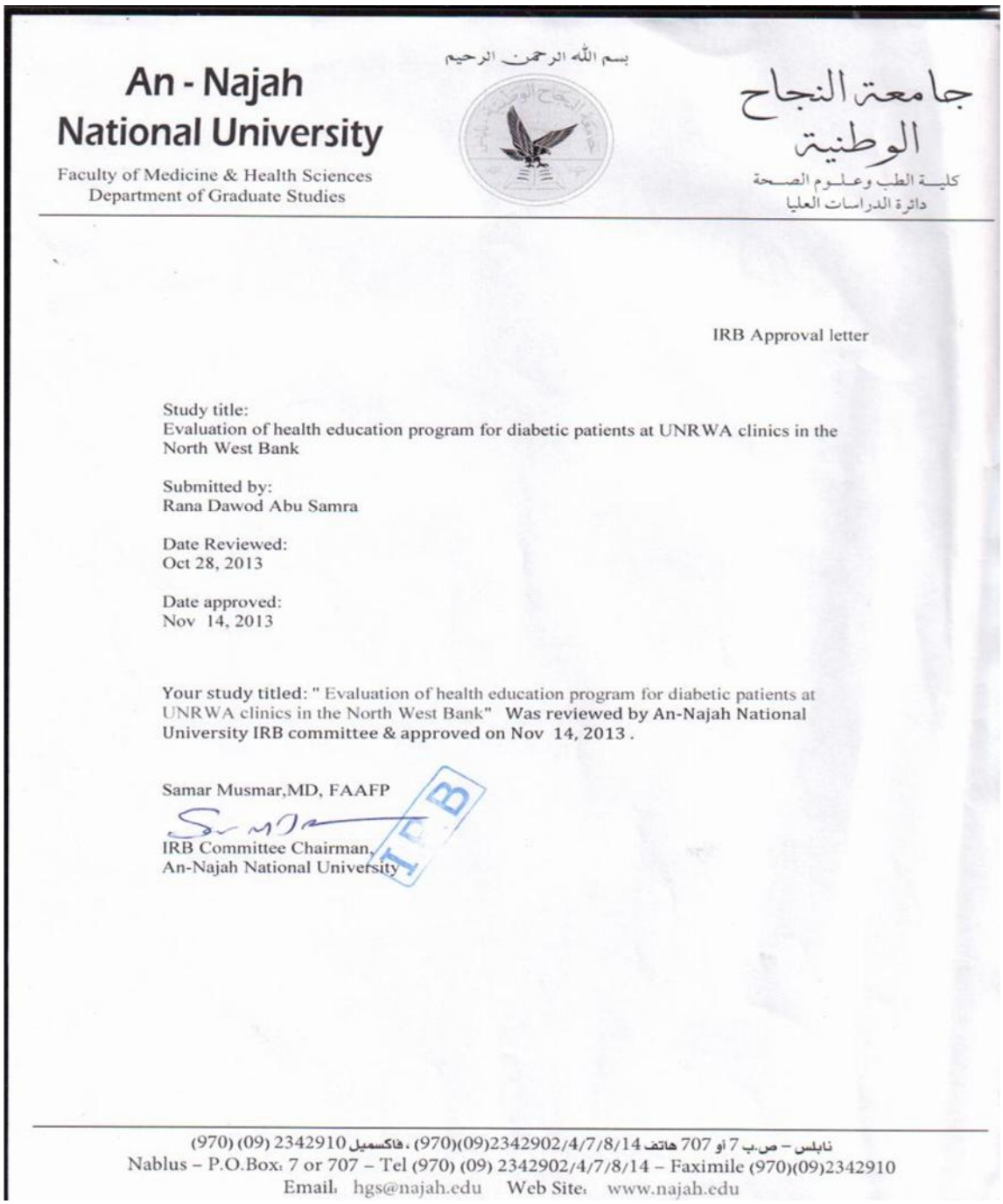
3. **التصورات:**
   - هل اصبحت اكثر وعيا: بعادات الأكل الصحية، الدور الذي يلعبه النشاط البدني **والالتزام الدوائي في إدارة مرض السكري، وماذا تعني نتائج دمك؟**
   - ماهي الطرق والسلوكيات التي تشعرفيها بأن البرنامج ساعد في تحسين الإدارة الذاتية لمرض السكري لديك، وكيف ثقتك على مواصلة هذه السلوكيات؟
   - هل تشعر بأن البرنامج لديه أي تأثير إيجابي على حياتك؟

4. **ماهي الصعوبات والعوائق التي واجهتك أثناء مشاركتك في البرنامج؟**

Annex V: Focus group for the health care workers

1. What is your opinion regards the educational program?
2. What were the strengths and weakness of the educational program?
3. How was the reaction of the participants through the program?
4. What were the difficulties and barriers facing you during implementation?

Annex VI: IRB



بسم الله الرحمن الرحيم

An - Najah National University

Faculty of Medicine & Health Sciences
Department of Graduate Studies

جامعة النجاح الوطنية

كلية الطب وعلوم الصحة
دائرة الدراسات العليا

IRB Approval letter

Study title:
Evaluation of health education program for diabetic patients at UNRWA clinics in the North West Bank

Submitted by:
Rana Dawod Abu Samra

Date Reviewed:
Oct 28, 2013

Date approved:
Nov 14, 2013

Your study titled: " Evaluation of health education program for diabetic patients at UNRWA clinics in the North West Bank" Was reviewed by An-Najah National University IRB committee & approved on Nov 14, 2013 .

Samar Musmar,MD, FAAFP
IRB Committee Chairman,
An-Najah National University

IRB

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جامعة النجاح الوطنية
كلية الدراسات العليا

تقييم برنامج التثقيف الصحي لمرضى السكري في عيادات وكالة غوث وتشغيل اللاجئين (الأونروا) في شمال الضفة الغربية

اعداد
رنا داود أبو سمره

اشراف
د. سمر مسمار
د. زاهر نزال

قدمت هذه الأطروحة استكمالا لمتطلبات درجة الماجستير في الصحة العامة بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين
2015

تقييم فعالية برنامج التثقيف الصحي لمرضى السكري في عيادات وكالة غوث وتشغيل اللاجئين (الأونروا) في شمال الضفة الغربية

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الملخص

مقدمة: مرض السكري والمضاعفات المرتبطة به تشكل مشكلة صحية كبيرة في فلسطين حيث أن معدلات الإصابة به هي الأعلى بين اللاجئين الفلسطينيين. يعتبر التثقيف الصحي جزءا هاما في إدارة مرض السكري وهو ما ثبت فعاليته في ضبط مستوى السكر في الدم والحد من المضاعفات المرافقة له. لذلك أطلقت الأونروا حملة والتي استمرت لمدة ستة أشهر وتحمل عنوان "الحياة أحلى مع سكر أقل" تهدف إلى تحسين الادارة الذاتية للمرض وسبل التعامل معه.

هدف الدراسة: تهدف هذه الدراسة إلى تقييم فعالية تطبيق برنامج التثقيف الصحي لمرضى السكري في عيادات الأونروا في شمال الضفة الغربية. بالإضافة إلى تحديد أسباب قلة مشاركة المرضى في هذا البرنامج والصعوبات المواجهة أثناء تنفيذه.

طريقة البحث: التقييم في هذه الدراسة كان كما ونوعا حيث تم استخدام استبيان قبلي وبعدي تم اعداده من قبل الوكالة لتقييم القياسات الحيوية والنشاط البدني والسلوكيات الغذائية للمشاركين بالإضافة الى استخدام استبيان لتقييم مستوى المعرفة لدى المشاركين في نهاية البرنامج. تم اجراء دراسة مسحية حيث تم اختيار عينة عشوائية من مرضى السكري الغير المشاركين لتحديد أسباب عدم الحضور. تم جمع البيانات النوعية عن طريق عقد عدد من حلقات النقاش مع المشاركين والعاملين في مجال الرعاية الصحية لتقييم آرائهم حول البرنامج. وتشكلت عينة الدراسة من 4 عيادات و75 مريض مشارك في البرنامج و120 مريض غير مشارك.

نتائج الدراسة: توصلت الدراسة الى وجود تحسن ملحوظ في مستوى المعرفة و سلوكيات الإدارة الذاتية لمرض السكري لدى المشاركين في نهاية البرنامج، بالإضافة الى وجود تحسن في المواقف والممارسات تجاه الغذاء الصحي والنشاط البدني والذي ترافق مع انخفاض ملحوظ في الوزن، معامل كتلة الجسم، محيط الخصر ونسبة السكر في الدم. في حين لم يلاحظ أي تغييرات كبيرة في مستوى الكوليسترول وضغط الدم. أظهرت النتائج النوعية أيضا أن مستوى الرضى كان جيدا لدى جميع المشاركين عن البرنامج والذي كان لا يخلو من التحديات حيث أفاد المشاركون عدم وجود أماكن مخصصة لجلسات التمارين الرياضية والطبخ في حين كان العائق الاساسي للتطبيق من وجهة نظر العاملين هو ضغط العمل، عدم وجود كوادر كافية والذي ترافق مع عدم التزام المتطوعين في التنفيذ. كشفت الدراسة أن عدم الإعلان عن البرنامج كان السبب الرئيسي لعدم الحضور والمشاركة فيه.

الخلاصة: أظهرت هذه الدراسة أن حملة الأونروا كانت فعالة في تحسين مستوى المعرفة و سلوكيات الإدارة الذاتية لدى المشاركين وتعزز الحاجة لتنفيذ مثل هذا البرنامج التثقيفي كجزء أساسي لإدارة مرض السكري في عيادات الوكالة. أوصت الدراسة بعقد جلسات متابعة شهرية على المدى الطويل لتعزيز فعالية البرنامج.