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Faculty of Graduate Studies

Prevalence of Depression among Diabetic Patients

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الاهداء

إلى الشمعة التي احترقت حتى توصلني إلى ما أنا فيه... أبي الغالي

إلى الروضة التي تنبت أزكى الأزهار إلى من يسعد قلبي بلقياها... أمي الغالية

إلى ينبوع العطاء الى رمز الرجولة والتضحية... زوجي الحبيب

إلى الأنامل الملائكية التي تحرك الأمل والحياة ...ابني محمد

إلى من يحملون في عيونهم ذكريات طفولتي وشبابي..... إخوتي وأخواتي

إلى من ضحوا بحريتهم من اجل حرية غيرهم..... الأسرى والمعتقلين

إلى من هم أكرم منا مكانة..... شهداء فلسطين

إلى من احتضنتني كل هذا الكم من السنين ..... فلسطين الحبيبة

إلى زملائي وزميلاتي في جامعة النجاح الوطنية

إلى كل من ساهم في إنجاح هذا العمل

الشكر والتقدير

أستاذنا الفاضل ا.د. وليد صويلح

لك منا كل الثناء والتقدير، بعدد قطرات المطر، وألوان الزهر ، وشذى العطر ، على جهودك الثمينة والقيمة من أجل الرقي بمسيرتنا التعليمة ..

إلى الدكتورة سماح الجابي المشرف الثاني على هذا البحث لجهودها ومساعدتها في إتمام هذا البحث.

إلى كل الأساتذة الأفاضل في الصرح العلمي الكبير(كلية التمريض في جامعة النجاح الوطنية)

إلى وزارة الصحة الفلسطينية ممثلة بكافة مراكزها الصحة النفسية الأولية للمساعدة في الوصول إلى المعلومات اللازمة لهذا البحث...

الاقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان :

Prevalence of Depression among Diabetic Patients

أقر بان اشتملت عليه هذه الرسالة هي من نتاج جهدي الخاص باستثناء من تمت الإشارة إليه حيثما ورد. وان هذه الرسالة ككل أو إي جزء منها لم يقدم من قبل لنيل درجة أو لقب علمي أو بحثي لدى إي مؤسسة تعليمية أو بحثية أخرى.

Declaration

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

Student's Name: **اسم الطالب:**

Signature: **التوقيع:**

Date: **التاريخ:**

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List of Abbreviations

Abbreviation	Meaning
APA	American Psychological Association
BDI	Beck Depression Inventory scale
BMI	Body Mass Index
CESD	The Centre for Epidemiologic Studies-Depression scale
CI	confidence interval
DM	Diabetes Mellitus
HbA1c	The glycated hemoglobin
IGR	Impaired Glucose Regulation
IRB	Institutional Review Board
MADRS	The Montogomery and Aasberg Depression Rating Scale
MMAS-8	Morisky Medication Adherence Scale
MOH	Ministry Of Health
NGOs	Non-governmental organizations
OR	Odd Ratio
PHQ-8	The eight-item Patient Health Questionnaire depression scale
SPSS	Statistical Package For Social Sciences
UNRWA	United Nations Relief and Works Agency
US	United State
WHO	World Health Organization
WHO-5	The World Health Organization-5 Well Being Index

Prevalence of Depression among Diabetic Patients

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Abstract

Background: Diabetes mellitus is a common chronic metabolic disorder, and is among of the main causes of death in Palestine. Palestinians are continuously living under stressful economic and military conditions which make them psychologically vulnerable. The purpose of this study was to investigate the prevalence of depression among type II diabetic patients and to examine the relationship between depression and socio-demographic factors, clinical factors, and glycemic control.

Methods: This was a cross-sectional clinical study at Al-Makhfiah primary healthcare center, Nablus, Palestine. Two hundred and ninety-four patients were surveyed, and Beck Depression Inventory (BDI-II) scale was used to assess the presence of depressive symptoms among them. Moreover, patients' records were reviewed to collect the socio-demographic characteristics of patients (age, gender, marital status, level of education, smoking status, body mass index (BMI)); and other information related to diabetes mellitus disease (duration of diabetes, glycemic control using the glycated hemoglobin (HbA1C) test, use of insulin); and presence of additional illnesses. In addition, medication adherence of the patients

included was assessed using the 8-item Morisky Medication Adherence Scale (MMAS-8).

Results: Out of 294 patients included, 164 (55.8%) patients were females and 216 (73.5%) were < 65 years old. One hundred and twenty patients (40.2%) scored ≥ 16 on BDI-II scale. Univaraite statistical analysis showed a significant association between high BDI-II score (≥ 16) and female gender, low educational level, having no current job, having multiple additional illnesses, low medication adherence and obesity (BMI ≥ 30kg/m2). On the other hand, no significant association was found between BDI-II score and glycemic control using (HbA1C), duration of diabetes, and the other socio-demographic factors. Multivatriate analysis showed that low educational level, having no current job, having multiple additional illnesses and low medication adherence were significantly associated with high BDI-II (≥ 16) scores.

Conclusion: In the current study, the prevalence of depression was higher than that reported in other countries. Although 40% of the assessed patients were considered as potential cases of depression, none of them were being treated with anti-depressants. Psychosocial evaluation should be recommended as a routine clinical assessment of diabetic patients at primary healthcare clinics to improve their quality of life and reduce adverse outcomes.

Key words: Diabetes mellitus, Depression, Palestine.

Chapter One

Introduction

1.1 Background

Diabetes mellitus (DM) is a common chronic metabolic disorder and health problem with serious medical and economic consequences. In developing countries there will be a 69% rise in the number of adults diagnosed with DM between year 2010 and 2030, and around 20% rise in the number of adults having DM in developed countries during this period (Shaw, Sicree, & Zimmet, 2010). In addition, compared to other parts of the world, the Arab world (i.e. North Africa, Middle East, and Gulf area) will be ranked the second regarding the increase in percentage of people with DM in 2030 (Shaw, et al., 2010). Few studies about prevalence of DM were carried out in Palestine, and they found a higher rate of DM in urban than in rural communities (Abdul-Rahim, Husseini, Giacaman, Jervell, & Bjertness, 2001; Husseini, Abdul-Rahim, Awartani, Giacaman, et al., 2000; Husseini, Abdul-Rahim, Awartani, Jervell, & Bjertness, 2000). However, no reliable data have been existed in Palestine regarding treatment, economic effect, complications, and outcomes of DM treatment (Husseini, et al., 2009).

Depression is a high prevalent psychological problem worldwide. At any specified time, around 340 million people suffer from depression worldwide (Greden, 2003). In a study that examined the prevalence of

mood disorders in some countries during a 12-month period found that the prevalence of mood disorders was ranged from 0.8% to 9.6% (Demyttenaere, et al., 2004). On the other hand, it was estimated that the prevalence of depressive disorders was higher among females compared to males worldwide, and depressive disorders were the 4th and the 7th leading cause of disease burden among females and males respectively (Meyer, 2004; Ustun, Ayuso-Mateos, Chatterji, Mathers, & Murray, 2004). In addition, major depression was found to be the 2nd leading cause of disability-adjusted life years (DALYs) lost in females and the 10th leading cause of DALYs lost in males (Michaud, Murray, & Bloom, 2001). In Palestine, psychological distress is high, quality of life is very low, and daily life of Palestinians is constantly under threat which make Palestinians more vulnerable to stress and depression (Husseini, et al., 2009).

Relationship between DM and depressive disorder has been examined by many researchers. Prevalence of depression among diabetic patients may vary according to DM type, race/ ethnicity, and developed and developing countries (Ali, Stone, Peters, Davies, & Khunti, 2006; Li, Ford, Strine, & Mokdad, 2008). Therefore, screening for depression among diabetic patients is important in different races and ethnicities. Actually, it was indicated that approximately 49% of the diabetic patients who have severe depression were misidentified by healthcare providers (W. Katon, et al., 2004; W. J. Katon, et al., 2004). Unfortunately, Palestinians with

chronic diseases are usually less likely to undergo regular screening as a part of medical care or preventive services (Giacaman, et al., 2009).

1.2 Statement of the problem

Given the scarcity of research about depression among Palestinians in general and among diabetic patients in particular makes such study needed. In addition, Palestinians are continuously living under stressful economic and military conditions which make them psychologically vulnerable. The knowledge gained from this study will assist healthcare practitioners to better understand depression in DM and design treatments that address the psychological and the metabolic needs of affected individuals to improve overall health outcomes.

1.3 Objective of the Study

The objectives of the current study were to:

1. estimate the prevalence of depression among Palestinian patients with type 2 DM who attended a primary healthcare setting.

2. assess the socio-demographic and clinical characteristics associated with depression among those diabetic patients.

1.4 Research questions

No	Research Question	Hypothesis	Statistics
1	What are the socio-demographic and clinical characteristics of individuals with Type II DM?	no hypothesis	Descriptive; mean ± SD or median (Q1 – Q2) based on normality of the data
2	What is the glycemic control, adherence and depression status of patients with type II DM?	no hypothesis	Descriptive; mean ± SD or median (Q1 – Q2) based on normality of the data
3	What is the relationship between higher depression score and socio-demographic variables?	No significant relationship found between higher depression score and socio-demographic variables.	Univaraite analysis
4	What is the relationship between higher depression score and clinical variables?	No significant relationship found between higher depression score and clinical variables.	Univaraite analysis
5	What are the factors associated with higher depression score	No significant relationship found between higher depression score and socio-demographic or clinical variables.	Multivaraite analysis using multiple logistic regression

Chapter Two
Literature Review

There are many studies about prevalence of depression in diabetic patients. However few were published from the Arab world. Below is a list of the studies with their main findings:

1. A study carried out in Jordan found that 19.7% of diabetic patients have depression according to the eight-item Patient Health Questionnaire depression scale (PHQ-8). The results of multivariate analysis showed that females were 1.91 more likely to have depression than males with ($p = 0.001$], and low-educated people were 3.09 more likely to have depression compared to educated people ($p \leq 0.002$). In addition, patients treated with insulin were 3.31 more risks to develop depression ($p = 0.001$). Furthermore, not following the recommended diet plans, lacking blood glucose self-monitoring and increased barriers to medications adherence were also significantly associated with the occurrence of depression among patients with DM (Rasmieh M. Al-Amer, Sobeh, Zayed, & Al-domi, 2011).

2. A study carried out in Iraq found that diabetic patients group were having higher score for depression compared to the control group; however both groups were scored > 16, which mean that both groups may complain from depression (Mansour & Jabir, 2007).

3. A study carried out in Sharjah, United Arab Emirates found that around 12.5% of patients had a score of $\geq$ 19 on the K6, which indicated a possible

mental health concern. In addition, among the diabetic patients included 24% suffered from diabetic complications which are mainly retinopathy, peripheral neuropathy or peripheral vascular disease. A significant association was found between higher scores on the K6 screening tool and the occurrence of these complications, the use of oral antidiabetic agents and the use of lipid lowering medications (Sulaiman, Hamdan, Tamim, Mahmood, & Young, 2010).

4. A study carried out in Bahrain found that 33.3% of diabetic patients scored 16 or more on Beck Depression Inventory (BDI) scale. It has been found that there was a significant association between higher BDI score (≥ 16) and gender, obesity (body mass index (BMI) ≥ 30kg/m^2), the presence of coronary artery disease, using insulin in DM treatment and developing nephropathy as DM complication. However, no significant association was found between BDI score (≥ 16) and glycemic control, duration of DM disease, the other socio-demographic variables and the other diabetic complications (Nasser, Habib, Hasan, & Khalil, 2009).

5. A study carried out in Pakistan in 2011found that depression was significantly associated with female gender (adjusted OR = 1.88; 95% CI = 1.07-3.31), family history of DM (OR = 2.64; 95%CI = 1.26-5.55), and poor glycemic control (OR = 5.57; 95%CI = 2.88-10.76). In addition, depression was significantly associated with low compliance to self-care activities such as dietary restrictions (OR = 0.45; 95%CI = 0.26-0.79),

taking dose as advised (OR = 0.32; 95% CI = 0.14-0.73), and foot care (OR = 0.38; 95%CI = 0.18-0.83) (Zuberi, Syed, & Bhatti, 2011).

6. A study carried out in India found that 23% of diabetic patients were classified to have major depression, 54 (18%) have moderate depression. While the majority of patients (178; 59%) did not meet the criteria of depression, thus they had no clinically significant depression. On the other hand, depression was significantly associated with patients older that 54 year (odds ratio (OR) = 1.26, 95% confidence interval (CI) = 1.02-1.67; $p < 0.05$), central obesity (OR = 1.34, 95% CI = 1.04-1.64; $p < 0.001$), and and pill burden (>4) (OR 1.27, 95% CI 1.01-1.44; P=0.035). In addition, developing DM complications (i.e. neuropathy, nephropathy, peripheral vascular disease, and diabetic foot) were significantly associated with developing depression among DM patients. On the other hand, the of the occurrence of depression was not significantly associated with DM disease duration and the use of insulin in DM treatment (Raval, Dhanaraj, Bhansali, Grover, & Tiwari, 2010).

7. A study carried out in the brazil by Papelbaum et al., (2011) found that the prevalence of depression among the study sample was 18.6%. In addition, diabetic patients who were complaining from depression had significant higher levels of HbA1c (8.6 ± 2.0) when compared to patients who did not show a mood disorder (7.5 ± 1.8) (Papelbaum et al., 2011).

8. A study carried out in the Netherlands found that about 33% of patients with type 1 DM, and 37-43% of patients with Type 2 DM were reported to

have a depressive affect based on the World Health Organisation-5 Well being Index (WHO-5). On the other hand, using the Center for Epidemiologic Studies-Depression scale (CESD); the prevalence of depressive affect was 25% and 30% in patients with Type 1 DM, and 35% and 38% in patients with Type 2 DM, respectively. In addition, depending on the Composite International Diagnostic Interview (CIDI), 8% of patients with Type1DM (no gender difference) and 2% of males and 21% of females with Type 2 DM suffered from a depressive disorder. Furthermore, depressive effect was associated with poor glycemic control and proliferative retinopathy in patients with Type 1 DM, while non-Dutch descent, obesity and neuropathy were correlated with depressive effect in patients with Type 2 DM (Pouwer et al., 2010).

9. A study carried out among South-Asian (SA) and White-European (WE) found that prevalence of depression for the total sample with Type 2 DM and impaired glucose regulation(IGR) was 21.3% (, 20.6% in SA and 21.6% in WE, p = 0.75) and 26.0% (28.9% in SA and 25.3% in WE, p = 0.65) respectively. In addition, for patients with normal glucose tolerance, the prevalence of depression was 25.1% (26.4% in SA and 24.9% in WE, p = 0.86). After age adjustment, the prevalence of depression was higher among females compared to males. In addition, the adjusted OR for age, gender, and race, showed no significant increase in the prevalence of depression in patients with Type 2 DM (OR = 0.95, 95%CI 0.62 to 1.45) or IGR (OR = 1.17, 95% CI 0.96 to1.42) (Aujla et al., 2009).

10. A study carried out in China found that 12% of the older adults reported physician-diagnosed DM, and 26% among them reported elated level of depressive symptoms. In addition, DM was significantly associated with depression even after age, gender, marital status, and education adjustment (Chou & Chi, 2005).

11. A study carried out in Bangladesh in 2007 found that 29% of males and 30.5% of females who were diagnosed with DM and 6.0% of males and 14.6% of females who did not have DM had depressive symptoms rating $\geq$ 20 on the Montogomery and Aasberg Depression Rating Scale (MADRS). A significant association was found between depressive symptoms and DM ($p < 0.01$). In addition, the association of depression with DM remained significant even after adjusting the potential confounding factors including age, gender, fasting plasma glucose > 7.0 mmol/l and waist-hip ratio (Asghar, Hussain, Ali, Khan, & Magnusson, 2007).

12. A study carried out in Greece in 2008 found that (33.4%) of the participants reported elevated depressive symptoms. In addition, diabetic females reported symptoms of depression higher than that among diabetic males (48.4% vs. 12.7%, $p < 0.001$). Among the female patients, depressive symptoms were associated with HbA1c ($p = 0.04$), and duration of diabetes ($p = 0.004$). On the other hand, among the males patients, no significant relationships between depressive symptoms and the testing variables was found (Sotiropoulos et al., 2008).

13. A study carried out in The US in 2009 found that mean BDI-II score, adjusted for age and gender, was significantly higher in patients with type 1 DM than in non-diabetic persons (least-squares mean ± standard error(SE): 7.4 ± 0.3 vs. 5.0 ± 0.3; $p < 0.0001$). In addition, Type 1 diabetic patients were using more antidepressant medications than non-diabetic participants (20.7 vs. 12.1%, $p = 0.0003$). Higher type 1 diabetic patients compared to non-diabetic participants were classified to have depression using BDI-II cut score (17.5 vs. 5.7%, $p < 0.0001$) or by either BDI-II cut score or antidepressant use (32.1 vs. 16.0%, $p < 0.0001$). In addition, patients who developed diabetes complications ($n = 209$) had higher mean BDI-II scores than those without complications (10.7 ± 9.3 vs. 6.4 ± 6.3, $p < 0.0001$) (Gendelman et al., 2009).

14. A study carried out in the US in 2009 found that younger age and female gender were associated with depression in patients with type 2 DM (Lee et al., 2009).

15. Another study carried out in the US in 1997 found that depressed patients were effectively discriminated from non-depressed participants based on the full 21-item BDI, the cognitive items alone, or the somatic items alone ($p < 0.001$ for each comparison). However, the cognitive items were significantly more effective than the somatic items ($p < 0.0005$). BDI total scores between 12 and 14 have the best balance between sensitivity (0.90-0.82) and specificity (0.84-0.89), but a cutoff score $\geq$ 16 for the entire 21-item has the best balance between sensitivity and positive predictive

value when prediction values were extrapolated to a diabetic population with a depression prevalence rate of 20%. This cutoff score would capture > 70% of the patients diagnosed with major depression yet provide > 70% certainty that a person screening positive actually has the psychiatric disorder (Lustman, Clouse, Griffith, Carney, & Freedland, 1997).

16. A study carried out in the US in 2007 found that patients with high BDI scores at the baseline and after 6-year follow-up had significantly higher baseline HbA1c values ($p = 0.01$), and were more likely to show progression of diabetic retinopathy (OR = 2.44; 95% CI = 1.01-5.88; $p = 0.049$) and progression to proliferative diabetic retinopathy (OR = 3.19; 95% CI = 1.30-7.87; $p = 0.01$) than patients with low BDI scores at both baseline and 6-year follow-up. This was independent of baseline medical risk factors for diabetic retinopathy (Roy, Roy, & Affouf, 2007) .

17. A study carried out in the US in 2005 found that Pearson correlations between BDI scores and HbA1c in all groups were low and insignificant ($0.015 \leq$ or $r \leq$ or 0.066) except for those administering three or more daily shots of insulin ($r = 0.284$; $p = 0.034$) (Surwit, van Tilburg, Parekh, Lane, & Feinglos, 2005).

18. A study carried out in the United States (US) found that the score of Diabetes Distress Scale [DDS] was significantly associated with glycated hemoglobin (HbA1c) and physical activity, whereas the score of PHQ8 was not. However, both DDS and PHQ8 scores were significantly and

independently associated with patients' diet and medication adherence (Fisher et al., 2009).

19. A meta-analysis study found that the risk for depression was not increased in patients with impaired glucose metabolism (IGM) versus patients with normal glucose metabolism (NGM) (OR = 0.96, 95% CI = 0.85-1.08). In addition, the risk of depression did not differ between individuals with undiagnosed diabetes and individuals with either IGM (OR 1.16, 95% CI 0.88-1.54) or NGM (OR 0.94, 95% CI 0.71-1.25). Individuals with IGM or undiagnosed diabetes had a significant lower risk of depression than individuals with previously diagnosed type 2 DM (OR = 0.59, 95% CI = 0.48-0.73, and OR = 0.57, 95% CI = 0.45-0.74, respectively) (Nouwen et al., 2011).

Chapter Three
Methodology

3.1 Design and Methods

This was a cross-sectional descriptive study for the purpose of evaluating the presence of depression symptoms and their association with glycemic control (HbA1c), medication adherence, clinical and demographic variables among Palestinians with type 2 diabetes mellitus.

Schmidt & Kohlmann (2008) defined cross-sectional study as one type of observational studies that involves data collection from a population, or a representative subset, at one specific point in time. They provide data on the entire population under study and may be used to describe some feature of the population, such as prevalence of an illness (Schmidt & Kohlmann, 2008).

3.2 Research Setting

The study was carried out at the governmental diabetes primary healthcare clinic (Al-Makhfia) in Nablus city. Nablus is the largest city in north West-Bank of Palestine. Residents of Nablus city are predominantly Arabs. There are five main healthcare providers of health services in Palestine: Ministry of health (MOH), United Nations Relief and Works Agency (UNRWA), Non-governmental organizations(NGOs) , Palestinian Military Medical Services (PMMS) and Private for profit. The MOH bears the heaviest burden, as it has the major responsibility (Palestinian Ministry

of Health, 2011). During the study period, the investigator visited the primary healthcare center at Al-Makhfeia, Nablus. The visits were made on Sundays, Tuesdays, Wednesdays and Thursdays every week. These are the assigned days for diabetic clinics to deliver care for patients with type II DM. Al-Makhfeia center is the only governmental center that provides care for diabetic patients with governmental insurance in Nablus city.

3.3 Sample Population

This study included a convenience sample of adult population. Participants were recruited from Al-Makhfeia diabetic clinics while waiting to be seen by their health care providers. The inclusion criteria for this study were: 1) males and females 18 years old and older who self-report being diagnosed with type 2 DM by a health care provider and has a medical file at the diabetic clinic; 2) self-report type 2 DM for one year or longer; 3) under medical care for diabetes treatment according to MOH documents; 4) able to understand the questions in order to help complete forms and questionnaires; 5) willingness to participate in this study and finally 6) being scheduled to do HbA1c at the laboratory of MOH at the time of the visit. The exclusion criteria were based on self-report of the following: 1) physical and or mental conditions that interfere with participation, and 2) inability to obtain venous blood sample.

3.4 Sample Size

No studies about the prevalence of depression among diabetic patients in Palestine have been reported. Therefore, we estimated the sample size based on studies in other Arab countries (Rasmieh M. Al-Amer, Sobeh, et al., 2011). The sample size was estimated based on the following assumptions: a descriptive study with dichotomous outcome the sample size tables shows that a sample of 246 participants is needed if we assume the prevalence of depression to be 20% and the width of CI to be 10% and the confidence limit to be 95%.

3.5 Data collection Procedure

The investigators obtained written approval from the Institutional Review Board (IRB) at An-Najah National University , MOH , and the Faculty of graduate studies- to carry out this study. A brief screening for recruitment of participants was conducted by the investigators to identify potential participants in the following manner: every person in the waiting area was asked if he is willing to talk to the investigator. If the person agreed to talk to the investigator for possible participation, the attending specialist was asked if that person is scheduled to do HbA1c at that visit. If the person who agreed was scheduled to do HbA1c, then an informed consent was read and obtained by the investigators at the diabetic clinic. Once the consent was signed, verification of inclusion and exclusion criteria took place. The questionnaires required for the study were presented and explained for its completion during this session. The forms and

questionnaires that were completed included: 1) demographic and clinical questionnaire to gain information on participant, 2) BDI-II to measure depressive symptoms, Morisky Medication Adherence Scale (MMAS-8) to determine level of medication adherence among participants.

An investigator, who is a graduate nursing student with a long experience in nursing, was trained prior to initiation of the study to assist in the recruitment and administration of questionnaires. Re-training of the investigator who administered the questionnaire took place after the first week of the research study based on the need to clarify certain points in the questionnaire. All participants completed the questionnaires in a private area in the clinic. A venous blood test, in a non-fasting state, was drawn for measuring the HbA1c during the same session. A certified medical technologist was available on site to obtain the sample and forward it to official labs of the MOH. Results regarding HbA1c for each participant were available to the primary investigator within the same working day. Data collection and the completion of questionnaires took place before HbA1c test. A note was given to healthcare provider in the clinic about each participant's HbA1c results.(Appendix 1)

3.6 Instruments

3.6.1 Measure of Depression Symptoms

The presence of depression symptoms was evaluated using the Beck Depression Inventory-Second Edition (BDI-II) (Beck, Steer, & Brown).

Beck Depression Inventory is a well-known self-report instrument. Its original version (21 items) was introduced in 1961 and its reliability and validity have been established across a broad spectrum of clinical and non-clinical populations (Beck, Guth, Steer, & Ball, 1997; Steer, Ball, Ranieri, & Beck, 1997, 1999; Steer, Cavalieri, Leonard, & Beck, 1999; Steer, Clark, Beck, & Ranieri, 1999; Steer, Rissmiller, & Beck, 2000; Winter, Steer, Jones-Hicks, & Beck, 1999). The BDI-II is available in English and has been translated into Arabic and validated for use to measure depression. Permission to use the Arabic version of BDI-II was obtained from the author who did the translation and validation (Alansari, 2005, 2006).

The term "depression" in this study referred to the self-report of depressive symptoms identified in the BDI-II. The format of the BDI-II test is for the participants to select and circle the number beside one of the four phrases listed that best describes their state in the past two weeks including the day the questionnaire is answered. The instrument consists of 21-items/statements that are self-reported and takes approximately 15 minutes to complete. The score ranges from 0 - 63 to determine possible degree of depression symptoms. The instrument developers established four groups of scores and classified as the following: "minimal 0-13, mild 14-19, moderate 20-28, and severe 29-63" (Beck, et al.). Scores provide an estimate of the overall symptom severity of depression. High scores indicate greater depressive symptoms. The researcher used the most

commonly used cut-off scores for BDI of ≥ 16 to indicate clinical depression (Nasser, et al., 2009)

3.6.2 Serum Glycated Hemoglobin Measure (HbA1C)

Glycated hemoglobin (HbA1c) is used to measure blood glucose control over several months and provides an estimate of how well DM has been controlled over the last 2 or 3 months. It is the goal standard of care for determining potential risk for developing problems, such as retinopathy, renal disease, cardiovascular disease, peripheral neuropathy or stroke. Potential complications are especially true if HbA1c remains high for a long period of time (ADA, 2010). The goal for HbA1c in adults is < 7% (ADA, 2010). Serum blood test for HbA1c was obtained on the same day and in the same clinic site either before or immediately after completing the questionnaires depending on time available in clinic. The blood sample was obtained by venous puncture drawn by a certified phlebotomist and sent to a designated local laboratory with coded identification number.

3.6.3 Medication Adherence

Anti-diabetic Medication adherence was measured using Morisky Medication Adherence Scale (MMAS-8) (Morisky, Green, & Levine, 1986). Approval to use and translate the MMAS-8 into Arabic language was obtained from the developer. The translation was carried out according to standard forward and backward method. The Arabic- translated version of MMAS-8 was used in previous publication (Jamous, et al., 2011). The

MMAS-8 is an eight items questionnaire designed to measure medication adherence. It is composed of seven Yes/No questions. Details of the Arabic translation and its use were described previously (Jamous, et al., 2011). The eighth question is a 5-points likert scale. In this study, patients with a total score of MMAS-8 less than 6 are considered to have poor medication adherence.(Morisky, Ang, Krousel-Wood, & Ward, 2008). Furthermore, the Arabic version of Morisky scale has not yet been validated.

3.6.4 Demographic and Health Questionnaire

A questionnaire was designed for this study to gain information that would assist in obtaining biographical and health history of the participants. The contents included personal descriptive data such as age, gender, years of education, and income. Personal identification information that may breach confidentiality of participants was not included. The inclusion of address was obtained separately to be able to send results of HbA1c, if desired. Information was obtained on medical history, duration of DM, current pharmacological DM treatment, and whether treatment for depression was in progress. The medical history components is a list of nine illnesses commonly identified with type 2 DM where the response is in a dichotomous (yes/no) format with an option to write in additional illnesses not included in the list. All the participants were asked to report all the medications that they use on chronic basis. The data reported by the participants regarding their medications was validated through checking the computerized system at the MOH which contained up-to-date information

about the patients and their medications. The questionnaire was available in Arabic language.

3.7 Data Management and Statistical Analysis

3.7.1 Pre-Analysis

During the pre-analysis phase, the data were coded to maintain confidentiality for all participants. Participants were given an identification number assigned by the primary investigator for use throughout the study. In order to carry out quantitative statistical analysis, measurement for variables was established. Demographic information and summative score of the instruments was obtained as a continuous measure as much as possible to ease the process of designation measure according to statistical analysis. The data were entered onto The Statistical Package for the Social Sciences SPSS-version 20) statistical software That was used for data analysis.

3.7.2 Statistical Analyses

Descriptive statistics were carried out for all variables and expressed as mean ± SD for continuous variables with normal distribution. Non-normally distributed continuous variables were expressed as median and lower–upper quartiles (Q1-Q3). Normality of the data was tested by Kolomogrov-Smirnov test. Factors associated with depression scores > 16 were analyzed using multiple logistic regression analysis. The dependent

variable was depression scores (≥ 16 versus < 16). A P- value of < 0.05 was considered statistically significant.

3.8 Protection of Human Subjects

Approval for this study was submitted to the IRB at An-Najah National University. All identifiable information was kept confidential and consent forms were number coded for identification. This file will be kept for five years after completion of the study. At the end of this period, records will be destroyed appropriately. The potential risks for participating in the study were few and included any of the following: (1) becoming fatigued or nervous while completing the questionnaires, (2) possibility of pain to site during needle stick, (3) a hematoma at the venous puncture site, and/ or (4) infection, although it is highly unlikely, from the needle stick. (Appendix 1)

Chapter Four
Results

During the study period, approximately 1400 patients visited the center and did the HbA1c test per required by the physician. Many of those patients left the clinic immediately after taking the blood sample which made them un-available for interview. A net total of 301 diabetic patients were available and agreed to do the interview. Seven patients were excluded because of their inability to communicate or understand the questions or have sensory impairment like being deaf. A net of 294 type 2 diabetic patients met the inclusion criteria and were interviewed and their HbA1c test was obtained.

The majority (216; 73.5%) of participants were younger than 65 years old. Age was negatively skewed with a median (Q1 – Q3) of 60 (52 – 66.25) years. The majority (164; 55.8%) of participants was female. The largest portion (n=213, 72.5%) of participants reported being either illiterate or had a limited school education while those with college education were minority (n=40; 13.6%). The marital status as reported by participants was married (n = 243; 82.7%), single/ divorced/ widowed (n=51, 17.3%). A small proportion (n=62, 21.1%) of the participants reported that they have a current job. The majority (n = 223, 75.9%) of participants were non-smokers at the time of the study. Participants reported the number of years since diagnosis with type 2 DM which showed a wide distribution ranging from 5 – 35 years, positive skewness with a median (Q1 – Q3) of 10 (5 – 16) years.The (BMI) of the participants

showed positive skewness with a median (Q1 – Q3) of 30.6 (27.2 – 35.1). The median (Q1-Q3) of The BMI for males was 28.8 (26.6 – 33.8) while that for females was 32 (28.3 – 37.4). The difference in BMI between males and females was significant ($P < 0.01$) with a Z score of – 3.44. More than half (166; 56.5%) of the participants had a BMI ≥ 30. Both systolic and diastolic blood pressures (SBP, DBP) showed positive skewness. The median (Q1 – Q3) values for SBP and DBP were 132 (120 – 143) and 80 (75 – 88) mmHg respectively.

The number of diabetes medications reported by participants ranged from 0-3 types with the mean ± SD being 1.7 ± 0.7 and a median (Q1 – Q3) of 2 (1 – 2) medications. One hundred and forty seven (50%) reported insulin use either as a monotherapy or in combination with other medications for diabetes management. Two hundred and sixty participants (88.4%) acknowledged having additional illnesses along with diabetes. The number of additional illnesses ranged from 1 – 5 with a median (Q1 – Q3) of 2 (1 - 3). The most common chronic illness reported by the participants was high cholesterol (n=219, 74.5%), followed by hypertension (n=178, 60.5%), cardiac problems (n=84, 28.6%) and renal problems (37, 12.6%). In the reported medical history, none of the participants recalled being informed that they had depression. Additionally, none of the participants reported taking medications for depression.

The results for HbA1c ranged from 5.2 to 13%, a median (Q1 – Q3) of 8.2% (7.2 – 9.1) and a mean of 8.3% ± 1.4. The median and mean scores

of HbA1c exceed the recommendation of < 7.0% established by the ADA (ADA, 2010). The results were un-equally distributed with 3 extreme scores representing HbA1c between 12 and 13%. The HbA1c results were further divided into two categories: controlled (<7%) and uncontrolled (≥7.0%). The percentage of participants who had a controlled glucose was 17.7% (n=52). However, 242 (82.3%) were in the uncontrolled level which places individuals at a greater risk for developing diabetic complication.

The depression symptoms score distribution was positively skewed with the majority of participants [174 (59.2%)] scored less than 16 while 120 (40.2%) patients scored ≥ 16 in the depression scale. Medication adherence scores were negatively skewed. The median value for medication adherence scores was 5.8 (4.8 – 6.8). The majority (n = 167, 56.8%) of the participants had low adherence scores (MMAS-8 < 6).

Table 1 shows univariate analysis of demographic and clinical factors with depression scores. The analysis showed that female diabetic patients, low level of education, having no current job, having higher number of additional illness, low medication adherence score and having high BMI were significantly associated with depression score of ≥16.

Furthermore, multivariate analysis showed that: 1) diabetic patients with college education have lesser odds [OR = 0.24 CI (0.087 – 0.664)] of depression than those with lesser level of education, 2) diabetic patients with no current job have higher odds [OR = 2.77 CI (1.23 – 6.265)] of

depression than those who are currently working, 3) diabetic patients with multiple additional illnesses have higher odds [OR = 1.807 CI (1.049 – 3.113)] of depression than those with ≤ 1 additional illness, and finally 4) diabetic patients with high medication adherence score have lesser odds [OR = 0.31 CI (0.18 – 0.529)] of depression than those with low (<6) medication adherence score.

Table 1: Univariate Analysis of demographic and clinical variables Associated with Depression

Variable	Total	BDI-II depression score		Unadjusted O.R	P-value
		≥ 16	< 16		
Age (years) ≤ 65 > 65	216 (73.5%) 78 (26.5%)	85 (39.4%) 35 (44.9%)	131 (60.6%) 43 (55.1%)	0.8 (0.47 – 1.34) Reference	0.4
Gender Male Female	130 (44.2%) 164 (55.8%)	43 (33.1%) 77 (47%)	87 (66.9%) 87 (53%)	Reference 1.8 (1.11 – 2.89)	0.017
Education Illiterate Elementary High School College	87 (29.6%) 126 (42.9%) 41 (13.9%) 40 (13.6%)	47 (39.2%) 53 (44.2%) 13 (10.8%) 7 (5.8%)	40 (23%) 73 (42%) 28 (16.1%) 33 (19.0%)	Reference 0.62 (0.4 – 1.1) 0.4 (0.2 – 0.9) 0.2 (0.1 – 0.5)	0.001 0.086 0.02 0.0001
Marital status Married Others	243 (82.7%) 51 (17.3%)	101 (41.6%) 19 (37.3%)	142 (58.4%) 32 (62.7%)	1.2 (0.64 – 2.2) Reference	0.58
Currently Smoking Yes No	71 (24.1%) 223 (75.9%)	32 (45.1%) 135 (60.5%)	39 (54.9%) 88 (39.5%)	1.3 (0.73 – 2.15 Reference	0.4
Working Yes No	62 (21.1%) 232 (78.9%)	12 (19.4%) 108 (46.6%)	50 (80.6%) 124 (53.4%)	Reference 3.63 (1.84 – 77)	<0.01
Duration of illness	10 (5 – 16)	12 (6 – 16.75)	10 (5 – 15)	1.016 (0.99 – 1.047)	0.323
Number of additional illness	114 (38.8%)	36 (31.6%)	78 (68.4%)	Reference 1.9 (1.16 – 3.1)	0.011

≤ 1 ≥ 2	180 (61.2%)	84 (46.9%)	96 (53.3%)		
Number of anti-diabetic medication ≤ 1 ≥ 2	112 (38.1%) 182 (61.9%)	44 (39.3%) 76 (41.8%)	68 (60.7%) 106 (58.2%)	Reference 1.11 (0.69 – 1.8)	0.68
Insulin use Yes No	147 (50%) 147 (50%)	64 (43.5%) 56 (38.1%)	83 (56.5%) 91 (61.9%)	1.25 (0.79 – 2) Reference	0.343
HbA1c < 7 ≥ 7	52 (17.7%) 242 (82.3%)	23 (44.2%) 97 (40.1%)	29 (55.8%) 145 (59.9%)	Reference 0.84 (0.46 – 1.544)	0.58
Medication Adherence score < 6 ≥ 6	167 (56.8%) 127 (43.2%)	86 (51.5%) 34 (26.8%)	81 (48.5%) 91 (73.2%)	Reference 0.344 (0.21 – 0.566)	< 0.01
BMI < 25 25 – ≥ 30	30 (10.2%) 98 (33.3%) 166 (56.5%)	7 (23.3%) 34 (34.7%) 79 (47.6%)	23 (76.7%) 64 (65.3%) 84 (52.4%)	Reference 1.75 (0.68 – 4.5) 3 (1.21 – 7.33)	0.016 0.247 0.017

Table 2: Multivariate Analysis of variables Associated with Depression

Variables	**B**	**S.E.**	**Wald**	**P-value**	**O.R (95.0% C.I)**
Gender (female)	-0.040	0.313	.016	0.898	0.961 (0.520-1.773)
Education(illiterate)			9.154	0.027	
Education (elementary)	-0.334	0.312	1.150	0.284	0.716 (0.388-1.319)
Education (high school)	-0.849	0.447	3.614	0.057	0.428 (0.178-1.027)
Education (college)	-1.424	0.517	7.569	0.006	0.241 (0.087-0.664)
Occupation(not working)	1.021	0.415	6.051	0.014	2.777 (1.231-6.265)
Additional illness (≥ 2)	0.592	0.277	4.550	0.033	1.807 (1.049-3.113)
BMI (<24)			3.791	0.150	
BMI (25 - < 30)	0.501	0.521	.924	0.336	1.650 (0.595-4.578)
BMI (≥ 30)	0.859	0.495	3.012	0.083	2.362 (0.895-6.234)
Adherence (MMAS-8 score ≥ 6)	-1.172	0.273	18.411	0.000	0.310 (0.181-0.529)

Chapter Five

Discussion

This study investigated the prevalence of depression among adult Palestinian type II diabetic patients and identified demographic and disease-related risk factors for depression. Our study showed that 40% of the screened patients are potential cases of depression. Most patients were females with multiple additional illnesses, currently jobless, had low educational level, had low medication adherence, and had an abnormally high BMI. However, multivariate analysis showed that the only significant predictors of depression were low education, having no current job, having multiple additional illnesses, and having low medication adherence.

Many research groups have investigated the relationship between DM and depression. Some research groups indicated that depression is highly prevalent among diabetics and the risk of depression might be increased in the presence of other co-morbid conditions (Ali, Davies, Taub, Stone, & Khunti, 2009; Anderson, Freedland, Clouse, & Lustman, 2001; Asghar, et al., 2007; Chou & Chi, 2005; de Groot, Jacobson, Samson, & Welch, 1999; Engum, Mykletun, Midthjell, Holen, & Dahl, 2005; Li, et al., 2008; Mansour & Jabir, 2007; Mezuk, Eaton, Albrecht, & Golden, 2008; Pibernik-Okanovic, Peros, Szabo, Begic, & Metelko, 2005; Pouwer, et al., 2010). Compared to other published studies, our results reported higher prevalence rate of depression among diabetic patients. A meta-analysis of 42 published studies found that the prevalence of major depression in

people with DM was 11% and the prevalence of clinically relevant depression was 31% (Anderson, et al., 2001). A study in Jordan reported that the prevalence rate of undiagnosed depression among Jordanian diabetic patients was 19.7% (R. M. Al-Amer, Sobeh, Zayed, & Al-Domi) while a meta-analysis study that was held in the United States reported a prevalence rate of depression among adult diabetic patients ranging from 3.8% to 27.3%(Anderson, et al., 2001). Other studies reported a prevalence rates of 5.4% (Zahid, Asghar, Claussen, & Hussain, 2008), 8% (Lloyd, Dyer, & Barnett, 2000), 32.4% (Bailey, 1996) and 41.3% (Rubin, Poland, Lesser, Winston, & Blodgett, 1987) This is the case of Palestinian people who have been living under chronic strain, apprehension and violence so that the prevalence of depression is higher than other country (Madianos, Sarhan, & Koukia, 2012).

The increased vulnerability to depression in individuals with type 2 DM is not yet clearly understood. However, depression involves physiological changes of the neuroendocrine system. The underlying cause of depression is thought to be related to changes in the neurotransmitters in the brain such as serotonin (5-HT), dopamine (DA), and norepinephrine (NE) which are monoamine neurotransmitters which affect mood and behavior. It is believed that during psychological stress counter regulatory hormones such as catecholamine a neurotransmitter, glucocorticoids, growth hormones, and glucagons are activated (Grisel, Rasmussen, & Sperry, 2006). The activation of the counter regulatory hormones interferes

in the action of insulin which is not able to lower glucose but instead elevates blood glucose. The increase in glucose level creates a greater challenge in maintaining metabolic control. Poor glycemic control and functional impairment due to increasing diabetes complications may cause or worsen depression and lessen the response to antidepressant treatment (Lustman & Clouse, 2005). In spite of the known devastating effect of depression on DM , it was found that only 31% of patients with DM and depression received adequate antidepressant treatment and only 6% received 4-5 sessions of psychotherapy in a 12 month period (Katon, 2008). Studies of the economics of treatments of depressed individuals with DM have yielded positive results. The health care expenses sustained by individuals with DM and depression are higher than those with diabetes alone (Ciechanowski, Katon, & Russo, 2000; Katon, et al., 2005). A recent study of the cost-effectiveness of treatment of depression among individuals with diabetes by Simon et al. concluded that systematic depression treatment significantly increased time free of depression resulting in an economic benefit from the perspective of the health plan(Simon, et al., 2007) . In summary, these studies suggest that treatment of depression in people with DM is both efficacious and cost-effective and can result in improved overall outcomes.

It may be argued that the high prevalence rate of depression found in our study is due to many patients having uncontrolled DM (82%). However, we did not find significant relationship between glycemic control

and potential for depression. Studies focusing on the relationship between depression and poor glycemic control gave mixed results. Studies have also shown a negative relationship between depression and poor glycemic control and diabetes complications. Worse glycemic control was observed in depressed adults with diabetes (Sahota, Knowler, & Looker, 2008). A meta-analysis study (Lustman, et al., 2000) found that depression was significantly associated with hyperglycemia in patients with type 1 and type 2 DM and that depression was associated with persistently higher HbA1c levels over the time period (Lustman, et al., 2000). Wagner et al.(2009) also found higher HbA1c and more diabetes complications in African Americans with higher depressive symptoms after controlling for confounders between depression and HbA1c levels (Wagner, Abbott, Heapy, & Yong, 2009). Van Tilburg reported that variations in depressive mood below the level of clinical depression were associated with differences in glycemic control among patients with type1 diabetes (M. A. L. Van Tilburg, et al., 2001). In a prospective representative study of patients with type 2 DM, depression predicted problems with medication adherence, and unsatisfactory glycemic control (Dirmaier, et al., 2010). Diabetes complications are also greater among individuals with depression. In a meta-analysis of 27 studies including adults with type 1 and type 2 DM, de Groot et al.(2001) found significantly greater diabetes complications including: diabetic retinopathy, nephropathy, neuropathy, microvascular complications and sexual dysfunction. Diabetes complications and mortality for individuals with depression has been

reported as being greater than in individuals with diabetes without depression (L. E. Egede, 2005a; W. J. Katon, et al., 2004). The microvascular and macrovascular complications of diabetes are augmented by the presence of depression in diabetes thus contributing to the increased mortality rate in this population (Black, Markides, & Ray, 2003). In contrast, many other investigators have found no relationship (Bailey, 1996; Marcus, et al., 1990; Niemcryk, Kraus, & Mallory, 1990; Palinkas, Barrett-Connor, & Wingard, 1991; Peyrot & Rubin, 1997; Robinson, Fuller, & Edmeades, 1988; Viinamaki, Niskanen, & Uusitupa, 1995; Wilson, et al., 1986; Winocour, Main, Medlicott, & Anderson, 1990) (Geringer, Perlmuter, Stern, & Nathan, 1988; Peyrot & Rubin, 1997). Cross-sectional studies have found a significant positive correlation between depressive symptoms and HbA1c in patients with Type 1 DM but no significant correlation in patients with Type 2 DM (Ciechanowski, Katon, Russo, & Hirsch, 2003; Surwit, et al., 2005; M. A. Van Tilburg, et al., 2001), giving rise to the hypothesis that depression affects glycemic control in patients with Type 1 but not Type 2 DM. In support of this notion, a study found that patients with Type 1 but not Type 2 DM who had a lifetime history of major depression showed significantly worse glycemic control than their counterparts without a history of depression (de Groot, et al., 1999; Georgiades, et al., 2007). A study showed that changes in depressive symptoms were not associated with changes in HbA1c or fasting glucose levels over a 1-year period in either patients with Type 1 or Type 2 DM (Georgiades, et al., 2007).

Our study showed that approximately two thirds of those who scored ≥ 16 points were females. The predominance of depression among females is consistent with other studies (Anderson, et al., 2001) (L. E. Egede, Zheng, & Simpson, 2002) (Rasmieh M. Al-Amer, , Ayman A. Zayed, & Al-domi, 2011; Asghar, et al., 2007; Black, et al., 2003; de Groot, et al., 2007; de Groot, Pinkerman, Wagner, & Hockman, 2006; Lustman, Griffith, Clouse, & Cryer, 1986; Peyrot & Rubin, 1997). In a meta-analysis, Anderson et al found that DM doubles the risk of depression and it is especially more among females (Anderson, et al., 2001). However, not all studies reported this gender differential (Peyrot & Rubin, 1997). Our results indicated that about 90% of the total sample was either overweight or obese (had a BMI > 25) which is expected in people with type 2 diabetes. The BDI score was significantly higher among obese patients. In a large community study, depression was found to be more common among diabetic women especially if they were overweight and the body weight in these women was a predictor of depression more than diabetes itself (Nichols & Brown, 2003). Similarly, recent studies have found that higher BMI was a predictor of depression in type 2 DM (de Groot, et al., 2007; Sacco, et al., 2007). High educational level decreases the odds of being classified as depressed patients which is similar to findings published in other studies (Rasmieh M. Al-Amer, , et al., 2011; W. Katon, et al., 2004). Medication adherence showed a significant relationship with depression. Aderent patients are associated with lower odds of being depressed. It has been reported by other researchers that depressed diabetic patients do not

pay much effort on daily management activities (Lerman, et al., 2004; Park, Hong, Lee, Ha, & Sung, 2004) and this result is consistent with many studies that reported that depressed diabetic patients are likely to have physical limitations and a poor quality of life (Brown, et al., 2000; Leonard E. Egede, 2004; Finkelstein, et al., 2003; McCollum, Ellis, Regensteiner, Zhang, & Sullivan, 2007), bearing in mind that self-care behaviors in diabetes include adherence to dietary restrictions and medications, adequate physical exercise and blood glucose monitoring (Lerman, et al., 2004; Park, et al., 2004). Clinical management guidelines for DM emphasize the importance of medication adherence, physical activity, diet and self-monitoring of blood glucose (L. E. Egede, 2005b). Gonzalez et al. (2008) proposed that the presence of depressive symptoms are good predictors of poor adherence to self-care particularly in adherence to medications and diet and exercise regimens Therefore, interventions should simultaneously address depression and self-care skills to achieve optimal diabetes outcomes. A systematic review of treatment adherence among individuals with DM and depression indicated that there was a significant relationship between depression and treatment non-adherence (Gonzalez, et al., 2008). Finally, our study indicated that having no work is significantly associated with depression score ≥ 16 points. This is expected since having no work is by itself a depressing factor.

Our study showed no significant association between depression score and age (P= 0.3). However, other studies showed association between

depression and age (Blazer, Moody-Ayers, Craft-Morgan, & Burchett, 2002). Our study showed that there was no statistical significant association between depression and the use of insulin which is contrary to another published study (Li, et al., 2008). Other studies reported that delayed initiation of insulin in type 2 makes a substantial number of patients vulnerable to diabetic complications and its adverse outcomes, including depression (Phillips, et al., 2001). Our study found that the duration of DM was not significantly associated with depression among diabetes. This is consistent with many studies that reported that the duration of illness was not associated with depression among diabetic patients (Karlson & Agardh, 1997; Miyaoka, Miyaoka, Motomiya, Kitamura, & Asai, 1997). However, because the incidence of diabetes complication increases with increased illness duration (Ajlouni, 2008), one could expect greater depression risk in those who have been ill for a longer time. Some research groups reported a significantly higher rate of depression in individual with long standing history of diabetes than in the newly diagnosed diabetic (Palinkas, et al., 1991).

Limitations of the study

Our study is the first to be conducted in Palestine to determine the prevalence of undiagnosed depression among diabetic patients. However, our study has few limitations. This study is cross-sectional where causal relationship between DM and depression cannot be established. The factors identified as predictors of depression may precede depression, but in some

cases, these factors could also occur as a result of depression; thus, undiagnosed depression among diabetic patients must be interpreted with caution. The primary limitation of this study was its partial reliance on self-report for its measures, including depression and medication adherence; therefore, a clinical interview to assess depression maybe a superior measure because of its higher level of specificity. Accordingly, a longitudinal study of a community-based sample is needed to assess the relationship between those variables at the same time. Furthermore, the Arabic version of Morisky scale has not yet been validated.

Conclusion

The prevalence of depression among Palestinian diabetic patients is higher than reported in other communities and has never been approached before. Being a female, not adherent to anti-diabetic medications, having low educational level and being jobless were significant predictors and are associated with an increased likelihood of developing major depressive disorders. We highly recommend the introduction of the psychological aspect among the diabetic health care plan to reduce the number of the depressed or the misrecognized depressed diabetic patients and consequently offer them a better quality of life.

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Appendix 1

Data collection sheet

Socio-demographic Data

1. Patient serial number: …….

2. Age: …….

3. Location □ City □ Village □ Camp ……..

4. Education □ Illiterate □ Elementary □ Secondary □ Diploma B.A

5. Material Status: □ Married □ Single □ Divorce □ widow

6. Gender □ male □ female

7. Smoker □ yes □ no

8. Occupation: □ employee □ labor □ none

9. Type of job: …….

10. File number in clinic……

Physical Data:

- Weight ……..
- Height ……..
- Waist circumstances: …….
- BP: first reading: …….. second reading:…….
  Third reading:

History of Diabetes mellitus

1. Duration of diabetes mellitus …….

Other medical history for patient:

□ Hypertension □Ischemic heart disease

□ Atrial fibrillation □ Heart failure

□ Hypercholesterolemia □Renal dysfunction

□Asthma/COPD □Hypercholesterolemia

□ Renal dysfunction □Others : ……

Current Drug profile:

Drug Name	Dose	Route	Frequency	Duration

Diabetes complications

□ Nephropathy □ Neuropathy

□ Retinopathy □ Coronary artery disease

□ Peripheral vascular disease □ Stroke

□Others : ……

Morisky Scale

1- هل تنسى أحيانا أن تتناول الدواء الخاص بالسكري	**نعم**	**لا**
2- لا يتناول الناس أحيانا الأدوية الخاصة بهم لأسباب أخرى غير النسيان. هل كان هناك أية أيام على مدى الأسبوعين الماضيين لم تتناول فيها الدواء الخاص باالسكري؟	**نعم**	**لا**
3- هل سبق لك أن خفضت أو توقفت عن تناول دواء السكري دون أن تخبر طبيبك وذلك لأنك شعرت بأن حالتك الصحية أصبحت أسوأ عندما تناولت الدواء؟	**نعم**	**لا**
4- عندما تسافر أو تغادر المنزل ، هل تنسى أحيانا اصطحاب دواء السكري ؟	**نعم**	**لا**
5- هل تناولت الدواء الخاص بالسكري بالأمس؟	**نعم**	**لا**
6- عندما تشعر بأن مستوى السكر لديك تحت السيطرة، هل تلجأ أحيانا إلى التوقف عن استعمال دواء السكري؟	**نعم**	**لا**
7- تناول العلاج بشكل يومي قد لا يروق لبعض الناس. هل تشعر بعدم رضا أو امتعاض أو تشويش بسبب التزامك اليومي بدواء السكري	**نعم**	**لا**
8- كم من الأحيان تواجه صعوبة في تذكر تناول جميع أدويتك؟ (يرجى وضع دائرة حول الرقم الصحيح)	**أبدا / نادرا 0** **من حين إلى حين 1** **أحيانا 2** **عادة 3** **دائما 4**	

استبانه "بيك" للاكتئاب

تعليمات : ستجد في الاستمارة مجموعة من الجمل الرجاء قراءة كل مجموعة بتمعن ثم اختار الجملة الوحيدة التي تصف حالتك بدقة خلال الأسبوعين الماضيين بما في ذلك اليوم ضع دائرة حول رقم الجملة التي تختارها.

No		Question
1	0	لا اشعر بالحزن
	1	اشعر بالحزن اغلب الوقت
	2	أنا حزين طول الوقت
	3	أنا حزين جدا أو غير سعيد إلى حد لا استطيع تحملها
2	0	أنا لست متشائما في نظرتي للمستقبل
	1	اشعر بان المستقبل غير مشجع
	2	اشعر بأنه لم يعد لدي شيء أتطلع إليه
	3	اشعر بان المستقبل لا أمل فيه وان الأمور لا يمكن أن تصبح أحسن
3	0	لا اشعر بأنني شخص فاشل
	1	لقد فشلت أكثر مما ينبغي
	2	كلما نظرت إلى الوراء أرى الكثير من الفشل
	3	اشعر بأنني شخص فاشل تماما
4	0	اشعر بالرضا اتجاه ما افعله في حياتي
	1	لم اعد استمتع بالأشياء بنفس الطريقة التي كنت عليها من قبل
	2	لم اعد احصل علي الشعور بالرضا الحقيقي في أي شيء أبدا
	3	أنا غير راضي أو اشعر بالملل في كل شيء
5	0	لا اشعر بالذنب
	1	اشعر بالذنب في كثير من الأوقات
	2	اشعر بالذنب تقريبا معظم الأوقات
	3	اشعر بالذنب طيلة الوقت
6	0	لا اشعر بأنني أعاقب
	1	اشعر أنني قد أعاقب
	2	إنني أتوقع أن أعاقب
	3	اشعر باني أعاقب فعلا
7	0	لا اشعر بخيبة أمل في قراره نفسي
	1	اشعر بخيبة أمل في نفسي
	2	أنا مشمئز من نفسي
	3	إنني اكره نفسي
8	0	لا اشعر بأنني بحال من الأحوال أسوا من الآخرين
	1	إنني انتقد نفسي في حالات ضعفي أو أخطائي
	2	إنني ألوم نفسي طيلة الوقت على أخطائي
	3	إنني ألوم نفسي على أي شيء سيء يحدث
9	0	ليست لدي أية أفكار للانتحار

	1	لدي أفكار للانتحار ولكن لا يمكنني تنفيذها
	2	أريد أن انتحر
	3	قد انتحر لو سمحت لي الفرصة
10	0	لا ابكي أكثر من المعتاد
	1	أصبحت ابكي أكثر من المعتاد
	2	إنني الآن ابكي طيلة الوقت
	3	كان بمقدوري البكاء قبل ذالك ولكني الآن لا استطيع أن ابكي رغم إنني أريد ذلك
11	0	لست أكثر تهيجا أو استثاره عن المعتاد
	1	اشعر بالتهيج والاستثارة أكثر من المعتاد
	2	اهتاج أو استثار لدرجة انه من الصعب علي البقاء
	3	اهتاج أو استثار لدرجة تدفعني للحركة أو فعل شيء ما
12	0	لم افقد رغبتي أو اهتمامي بالناس الآخرين
	1	أصبح اهتمامي بالناس الآخرين اقل من المعتاد
	2	لقد فقدت معظم اهتماماتي ورغبتي في الناس الآخرين
	3	لقد فقدت كل اهتماماتي ورغبتي في الناس الآخرين
13	0	قدرتي على اتخاذ القرار لم تتغير تقريبا
	1	أؤجل اتخاذ القرارات أكثر من المعتاد
	2	لدي صعوبة في اتخاذ القراراات أكثر من ذي قبل
	3	ليس بمقدوري اتخاذ قرارات إطلاقا
14	0	لا اشعر باني عديم القيمة
	1	لا اعتبر نفسي ذو قيمة وذو نفع كما اعتدت أن أكون
	2	اشعر أنني عديم القيمة بالمقارنة بالآخرين
	3	اعتقد أنني عديم القيمة تماما
15	0	لدى نفس القدر من الطاقة كالمعتاد
	1	لدى قدر من الطاقة اقل من المعتاد
	2	ليس لدى طاقة كافية لعمل الكثير من الاشياء
	3	لا استطيع القيام بأي عمل على الإطلاق
16	0	استطيع أن أنام كالمعتاد
	1	نومي لم يعد كالمعتاد
	2	استيقظ ساعة أو ساعتين قبل المعتاد واجد صعوبة في الاستغراق في النوم ثانية
	3	استيقظ بعدة ساعات قبل المعتاد ولا استطيع النوم فيما بعد
17	0	لا اشعر بالإرهاق أو الانزعاج أكثر من المعتاد
	1	أرهق أو انزعج بسرعة أكثر من ذي قبل
	2	اشعر بالإرهاق و الانزعاج من أداء أي شيء تقريبا
	3	إنني في غاية الإرهاق والانزعاج للقيام بأي عمل كان
18	0	شهيتي للأكل ليست أسوأ من المعتاد
	1	شهية للأكل ليست جيدة
	2	شهيتي للأكل أصبحت أسوأ بكثير
	3	ليست لدي أي شهية للأكل على الإطلاق
19	0	استطيع التركيز بكفاءتي المعتادة

لا استطيع التركيز بنفس الكفاءة المعتادة	1	
من الصعب على أن أركز عقلي على شيء لمدة طويلة	2	
أجد نفسي غير قادر على التركيز على إي شيء	3	
لست أكثر إرهاقا أو إجهادا من المعتاد	0	20
أصاب بالإرهاق أو الإجهاد عن عمل الكثير من الأشياء التي اعتدت عملها	1	
يعوقني الإرهاق أو الإجهاد عن عمل الكثير من الأشياء التي اعتدت عملها	2	
إنا مرهق أو مجهد جدا لعمل اغلب الأشياء التي اعتدت عليها	3	
رغبتي الجنسية لم يطرأ عليها أي تغيير	0	21
لدي رغبة في الجنس اقل مما كانت عليه	1	
رغبتي في الجنس اقل بكثير الآن	2	
لم تعد لدي أي رغبة في الجنس على الإطلاق	3	

(scores from 0-13 indicate minimal depression, scores from 14-19 indicate mild depression, scores from 20-28 indicate moderate depression, and scores from 29-63 indicate severe depression).

Result of investigations:

Test for diabetes mellitus	result
HBA1C	
Fasting blood glucose	

Important comments:

……

Appendix

جامعة النجاح الوطنية

كلية الدراسات العليا

نموذج موافقة على المشاركة في بحث

الباحثة: هنادي معين إحسان أبو حديد طالبة في كلية الدراسات العليا / ماجستير صحة نفسية مجتمعية، جامعة النجاح الوطنية

المشرف: البروفيسور وليد صوليح أستاذ في قسم الصيدلة/ كلية الطب وعلوم الصحة/ جامعة النجاح الوطنية و الدكتورة سماح الجابي أستاذ مساعد في قسم الصيدلة/ كلية الطب وعلوم الصحة/ جامعة النجاح الوطنية.

الجهة المشرفة: جامعة النجاح الوطنية / كلية الدراسات العليا / قسم التمريض / الصحة النفسية المجتمعية.

عنوان البحث:

معرفه مدى انتشار الاكتئاب بين مرضى السكري

Prevalence of Depression among Diabetic Patients

يحتوي هذا الملف على :

1. معلومات وتفاصيل البحث

2. شهادة الموافقة على المشاركة في البحث

(سيقدم لكل مشارك نسخة كاملة عن ورقة الموافقة على المشاركة في البحث)

معلومات وتفاصيل البحث

أخي/ أختي المشارك/ة:

أنا الباحثة هنادي أبو حديد طالبة ماجستير صحة نفسية مجتمعية في جامعة النجاح الوطنية يسرني أن أدعوك إلى المشاركة في بحثي المتعلق بمعرفة مدى انتشار الاكتئاب بين مرضى السكري . لك كامل الحرية والإرادة في المشاركة في هذا البحث ولك الحق في اخذ الوقت الكافي للتفكير في المشاركة من عدمها وسؤال الباحث عما تراه مناسبا والتحدث لأي شخص أو جهة عن هذا البحث.

كما يمكنك الاستفسار عن أي جزء يتعلق في البحث الآن أو فيما بعد وإذا كانت هناك كلمات أو أجزاء غير مفهومة بإمكانك سؤال الباحث وستجد/ين الوقت والإجابة الكافيتين.

يضمن البحث سرية المعلومات المتعلقة بالمشارك/ة.

الهدف من البحث: إن الغرض من هذه الدراسة التعرف على مدى انتشار الاكتئاب بين مرضى السكري من النوع الثاني،ودراسة العلاقة بين الاكتئاب والعوامل الاجتماعية والديمغرافية، والعوامل السريرية،ودرجة التحكم بنسبة السكر في الدم. كما ان مشاركتك ودعمك لهذا البحث سيساهمان في تطوير وتعزيز الواقع الصحي في فلسطين.

طبيعة المشاركة في البحث: بعد الموافقة على المشاركة في البحث لمعرفة مدى انتشار الاكتئاب بين مرضى السكري ، سنطلب من المشارك اخذ عينة دم منه لقياس مستوى السكر التراكمي و كذلك قياس الضغط واخذ الوزن والطول ، تليها مقابلة شفوية لأخذ معلومات تتعلق بالعوامل الاجتماعية والديموغرافية التي تلزم لمعرفة مدى انتشار الاكتئاب بين مرضى السكري.

اختيار المشاركين:

سيتم اختيار المشاركين من مرضى السكري والمراجعين في عيادة السكري – مديرية الصحة في محافظه نابلس .

المشاركة طوعية واختيارية وبإمكان المشارك الانسحاب من البحث في أي وقت ودون الحاجة لإبداء الأسباب وبدون أي تبعات.

المدة المتوقعة لإنهاء إجراءات البحث:

عشرة دقائق لكل مشترك .

شهادة الموافقة على المشاركة في البحث:

إقرار من المشارك في البحث: قمت بقراءة المعلومات الواردة في ورقة معلومات البحث وأتيحت لي الفرصة أن أسال أي سؤال وقد تمت الإجابة على كافة أسئلتي بشكل كاف، وبناءا على ذلك أوقع طوعيا على المشاركة في هذا البحث.

اسم المشارك.....

توقيع المشارك.....

التاريخ...../...../.....

اقرار من الباحث:

قمت بقراءة المعلومات الواردة في ورقة معلومات البحث بطريقة صحيحة وواضحة، وبذلت جهدي أن يعي المشارك أن البحث سيتضمن:

1. مقابلة المشارك في البحث في عيادة السكري – مديرية الصحة في محافظه نابلس لأخذ عينة دم منه و كذلك قياس ضغط الدم واخذ الطول والوزن .
2. التحدث إلى المريض شفويا لأخذ المعلومات المتعلقة بالعوامل الاجتماعية والديموغرافية.

أؤكد على أن المشارك اخذ الفرصة الكافية للإجابة على استفساراته بشكل واضح وصحيح وبذلت ما بوسعي لتحقيق ذلك.

أؤكد أن المشارك لم يجبر على التوقيع على الورقة وان مشاركته كانت بمحض إرادته وكامل اختياره.

الباحثة:

هنادي معين ابو حديد

توقيع الباحث.....

التاريخ...../...../.....

جامعة النجاح الوطنية
كلية الدراسات العليا

معرفة مدى انتشار الاكتئاب بين مرضى السكري

إعداد

هنادي معين ابو حديد

إشراف

أ.د. وليد صويلح

د. سماح الجابي

قدمت هذه الأطروحة استكمالا لمتطلبات الحصول على درجة الماجستير لتخصص تمريض الصحة النفسية المجتمعية بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس– فلسطين
2014

معرفه مدى انتشار الاكتئاب بين مرضى السكري

إعداد

هنادي معين ابو حديد

إشراف

أ.د. وليد صويلح

د. سماح الجابي

الملخص

الخلفية:

يعتبر داء السكري من أشهر الأمراض المزمنة ومن احد الأسباب الرئيسية المودية للوفاة في فلسطين. حيث أن الفلسطينيين الذين يعيشون باستمرار في ظل ظروف اقتصادية وعسكرية مرهقة مما يجعلهم اكثر عرضة للحالات والضغوطات النفسية .

الأهداف :

إن الغرض من هذه الدراسة التعرف على مدى انتشار الاكتئاب بين مرضى السكري من النوع الثاني، ودراسة العلاقة بين الاكتئاب والعوامل الاجتماعية والديمغرافية، والعوامل السريرية، ودرجة التحكم بنسبة السكر في الدم.

منهجية الدراسة:

تم اختيار عينة الدراسة باستخدام أسلوب العينات السريرية المستعرضة في عيادة المخفية للرعاية الأولية –نابلس –فلسطين .حيث تمت عمليه المسح على 294 مريض سكري من النوع الثاني لفحص وجود أعراض الاكتئاب وذلك باستخدام (مقياس بيك لقياس الاكتئاب) . بالإضافة إلى ذلك تمت مراجعة سجلات المرضى لاستخلاص المعلومات التالية:الخصائص الاجتماعية والديموغرافية بما في ذلك: العمر، الجنس، الحالة الاجتماعية، ومستوى التعليم، والتدخين، ومؤشر كتلة الجسم(BMI) ، ومدة الاصابه بمرض السكري، ومستوى السكر التراكمي

(HbA1c), واستخدام الأنسولين في العلاج، وجود أي أمراض إضافية. وتم تقييم مدى التزام المرضى بالعلاج باستخدام مقياس مورسكي (Morisky 8).

النتائج:

164 مريض (55.8%) كانوا اناث , (73.5%) كانو اقل من 65 سنة , 120 مريض (40.2%) سجلوا اكبر من 16 نقطة على مقياس بيك لقياس للاكتئاب.

هناك دلالة احصائية ذات مغزى بين الذين حصلوا على علامة اعلى او يساوي 16 على مقياس بيك لقياس الاكتئاب وبين (اناث/اصحاب مستوى تعليم منخفض/ ومن ليس لديهم وظيفة/ ومن لديهم امراض اخرى / ومن لديهم التزام اقل بالعلاج / ومن يعانون من السمنة).

لم يتم ايجاد دلالة احصائية ذات مغزى في العلاقة بين العلامة على مقياس بيك للاكتئاب النفسي ومدى التحكم في نسبة السكر التراكمي والعوامل الاجتماعية الاخرى.

هناك دلالة إحصائية ذات مغزى بين الحصول على علامة عالية في مقياس بيك للاكتئاب النفسي من جهة وانخفاض مستوى التعليم وعدم وجود وظيفة وعدم الالتزام بالعلاج من جهة أخرى.

الاستنتاجات :

نسبة انتشار الاكتئاب كان مرتفعا في الدراسة أعلى من النتائج في الاقطار الاخرى حيث إن حوالي 40% من المرضى كانوا معرضين للإصابة ولم يتم معالجة احد بواسطة مخفضات الاكتئاب . كذلك وجوب متابعة العوامل النفسية كجزء من متابعة الروتينية للمرضى في مراكز الرعاية الصحية الأولية لتحسين مستوى الحياة وتخفيض الأعراض السلبية المصاحبة لمرض السكري على المرضى.