Predictors of Depression among Diabetes Mellitus Outpatient Attending King Abdul-Aziz Specialist Hospital in Taif, Saudi Arabia (2018)

AL-Asiri, Ibrahim Sulaiman H.[1*], Fawaz Alotaibi[2]

[1]R4 Family Medicine Resident, MOH, Taif, KSA.
[2]Consultant Family Medicine, Addiction Medicine, Armed Forces Center for Psychiatric Care, Taif, KSA.

Corresponding Author Email: abokalil 07 @ Hotmail . com

ABSTRACT

Diabetes is a primary contributor to the global burden of sickness and a developing range of research has shown hyperlinks among melancholy and diabetes. However, the available data regarding the superiority of depression in diabetes patients in KSA have been limited, and restricted in Taif region. Objectives: To assess the prevalence and determinants of depression in the sufferers of diabetes attending diabetic clinics, King Abdulaziz Specialist hospital, Taif. Methods: a cross-sectional study design was adopted including a random sample of the adult diabetic patients attended the Diabetic center at King Abdulaziz Specialist hospital in Taif city, Saudi Arabia. A data collection questionnaire composed of three parts was utilized for data collection including the personal characteristics, diabetes-related variables and the Arabic version of Beck Depression inventory scale (BDI-II) to screen depression. Results: The patients' age ranged between 18 and 92 years. Depression was reported among almost half of diabetic patients (47.4%). Factors significantly associated with depression were patient`s gender, marital status, family history of depression, level of glycated hemoglobin, level of fasting blood glucose, history of insulin therapy, number of daily taken drugs other than those of DM, compliance with therapy and presence of diabetic complications. Conclusion: Approximately half of the patients were depressed, mostly of the mild and moderate levels. Some personal-related and diabetes –related associated factors were identified. The rehabilitation program was recommended.

Key words: *Depression, Diabetes Mellitus, Predictors*

INTRODUCTION

Diabetes is a chronic sickness which influences each organ inside the human system, undoubtedly. The WHO projected that 300 million people will be afflicted by diabetes by 2025. [1] In KSA, the number of humans with diabetes is increasing due to populace growth, aging, urbanization, and growing incidence of the weight problems and physical inactivity. The general prevalence of diabetes was 23.7%, with 26.2% being males and 21.5% females [2].

Depression is a mental disorder that is commonly presented with depressed mood, decreased energy, emotions of guilt or low self-confidence, loss of interest or pleasure, poor concentration, and disturbed sleep or appetite. Depending on the number and severity of symptoms, it can be categorized as mild, moderate, or severe [3].

The lifetime occurrence of the principal despair in adults has been expected to be 7 to 12 % in men, and 20 to 25 % in women. The prevalence of despair in patients in primary care settings has ranged from 5 to 10 %. The rates have been notably higher in persons with the certain medical conditions, including obesity, diabetes mellitus, cancer, and a history of myocardial infarction [4].

Diabetes is a major contributor to the worldwide burden of ailment and a developing variety of research has shown hyperlinks among despair and diabetes [5–8]. The rate of despair in people with diabetes has been much higher than in the general population [9]. A meta-analysis including 20 controlled reseach studies observed that the chance of depression in the diabetic organizations was two-fold higher than that, in the non-diabetic comparison groups [10]. This relative threat of depression has been more than that observed in the most other persistent illnesses [11]. The risk of depression has been increased in women with diabetes [9]. The superiority of despair has been more in the sufferers of diabetes who have had long-term complications [12, 13].

Comparing the sufferers of diabetes and despair with healthy poeple, the patients with despair and diabetes have been proven to have poorer self-management and poor adherence to the antidiabetic, lipid-lowering and antihypertensive treatment [14]. They have been more likely to have higher cardiovascular risk elements such as smoking, sedentary lifestyle, obesity, and uncontrolled hyperglycaemia [13]. Depression may be a critical barrier to the effective diabetes management. Sufferers of depression and diabetes have been more likely to have better macrovascular and microvascular difficulties [9] and higher mortality rates [15]. At the same time, depression may additionally contribute to bad diabetes-associated outcomes, and diabetes and its complications may also contribute to the negative melancholy effects [11, 14, 16], within the absence of the systematic screening, the family physicians have left out at the least 50% of the cases of the principal despair [17, 18].

Aim of the study

The aim of this study was to analyze the superiority and determinants of depression in the sufferers of diabetes attending diabetic clinics, King Abdulaziz Specialist hospital, Taif, Saudi Arabia.

METHODOLOGY

Study design:

A cross-sectional study design was adopted.

Study setting:

The study was carried out in the diabetic center at King Abdulaziz Specialist hospital, Taif city, Mecca.

Target population:

All diabetic patients (type 1, type 2) attending diabetic clinics of King Abdulaziz Specialist hospital throughout the study period (April to June, 2017) constituted the target population of the study.

Inclusion criteria were Saudi adult (18 years or above) diabetic patients of both sexes attending the diabetic center at King Abdulaziz Specialist hospital.

Exclusion criteria

Patients <18 years of age, illiterate patients, non-Saudi patients, any patient with sever psychosis or other form of sever co-morbidities, gestational diabetes since they have been followed up out of the center at obstetrics and gynecology clinics, were excluded from the study.

Sample size:

The sample size (400 patients) was chosen from different clinics in the diabetic center by applying a systematic random sampling technique to select 20 patients daily.

Data collection tools:

A questionnaire which was developed by the researcher including the following three parts was utilized for data collection:

Personal characteristics : Age, sex, education, employment, marital status, number of children, presence of co-morbidity (e.g., hypertension, heart disease, bronchial asthma, renal disease, etc.), smoking and family history of depression.

Diabetes-related variables: duration of disease, insulin treatment, compliance with therapy, presence of complications. In addition to the data collected from the patients' file (type of diabetes, number of follow-up visits over the last year, last fasting blood glucose level, last HBA1c, weight and height). Fasting blood sugar level (mg/dL) of the diabetic patients was assessed. The level of the control of diabetes as indicated by fasting blood sugar control was determined according to Campbell and Braithwaite [19], as follows:

Good (<126 mg/dL)

Borderline (126-180 mg/dL)

Poor (>180 mg/dL)

Glycosylated hemoglobin (HBA1c) Levels above 9% was considered as the poor control, and the levels above 12% were considered as very poor control [20]. The Body mass index (BMI) was calculated by dividing the weight in kg by the square of the length in meter. The participants were categorized, based on their BMI values into four subgroups; normal (BMI from 18.5 to 24.9 kg/m2), overweight (BMI from 25 to 29.9 kg/m2), Obese (BMI from 30 to 39.9 kg/m2), and extremely obese (BMI ≥ 40 kg/m2).

The Beck Depression inventory scale (BDI-II), Arabic version,[21] was used for the screening of depression amongst the study population. It is a 21-item self-report measure, and considered as one of the most popular screening instruments for detecting the symptoms of depression. It can be used to assess the individuals with depressive disorders (13 years of age or older) [22]. It has been designed to document the depressive symptoms experienced over a week before testing. The responses to the 21 items have been made on a 4-point scale, ranging from 0 to 3 (scores could range from 0 to 63). The traditional cut-off points which were used to estimate the severity in adults included: 10–16 indicating the possible mild depression, 17–29 the likely moderate depression; and 30–63 the probable severe depression [23].

Pilot study: A pilot study was conducted on 40 patients to test the wording of the questionnaire in order to avoid the inter-observer variation or bias.

Administrative and ethical considerations:

All the necessary official permissions were obtained before the data collection. Prior to the data collection, the investigator informed all the participants regarding the objectives of the study. They were assured that no harm would be ever expected to occur if they decide to participate in the study. They were also assured about the anonymity and the full confidentiality of their responses. Their verbal consents to participate were requested. All the diabetic subjects who obtained scores >10 were referred to a psychiatrist to establish the final diagnosis and start the management, accordingly.

During the data collection, thirty seven patients refused to participate in the study.

Data entry and statistical analysis

Statistical Package for Social Sciences (SPSS) software version 23.0 was used for the computerized data entry and analysis.

RESULTS

Three hundred sixty-three diabetic patients were included in this study. Regarding the socio-demographic characteristics, their age was ranged between 18 and 92 years (with a mean±SD of 46.7±13.8 years). The males represented 52.9% of them. Most of the participants (79.6%) were married. More than half of them (57.9%) had at least four children. More than one third of them (35%) were either housewives or not working ; whereas 30.9% were governmental employees. The income of 40.1% of them was 5000 SR/month or less, whereas that of 28.8% exceeded 10000 SR/month. The prevalence of the current smoking among the participants was 11%, whereas that of ex-smoking was 18.5%.

Regarding the medical history, the results revealed that the family history of depression was reported among 36 patients representing 9.9% of the respondents. Less than half of the participants (43%) had a history of chronic disease other than DM. About one-third of them (32.2%) reported a history of taking at least 3 drugs on daily basis for their medical problems.

In relation to the diabetic history, the result showed that more than half of the diabetic patients (60.6%) reported insulin therapy. Approximately two-thirds of them (64.5%) claimed that they have been perfectly compliant with the diabetic therapy, whereas only 18 patients representing 5% of the participants reported that they have not been compliant with the diabetic therapy. The diabetic complications were reported among 19.6% of the diabetic patients. Type 2 diabetes was represented in most of the cases (79.3%), whereas the remaining 20.7% were of type 1 diabetes. Regarding the follow-up visits over the last year, 43.8% of the patients reported two visits, whereas only 1.9% reported four visits.

Related to the measurements, the study showed that the body mass index of the diabetic patients ranged between 14.9 and 55.2 kg/m2 with almost half of them (50.7%) who were obese, and 6.3% who were extremely obese. FBG ranged between 80 and 455 mg/dL with more than half of them (56.7%) had poor level, and 27% had borderline level. The glycated hemoglobin percentage ranged between 5.2 and 14.4%. According to the glycated hemoglobin, diabetes was poorly controlled in 33.1% of the patients and very poorly controlled in 5.2% of them.

As shown in figure 1, depression was reported in almost half of the diabetic patients (47.4%). It was mild in 20.1% of them, moderate in 20.4%, whereas it was severe in 6.9% of the patients.
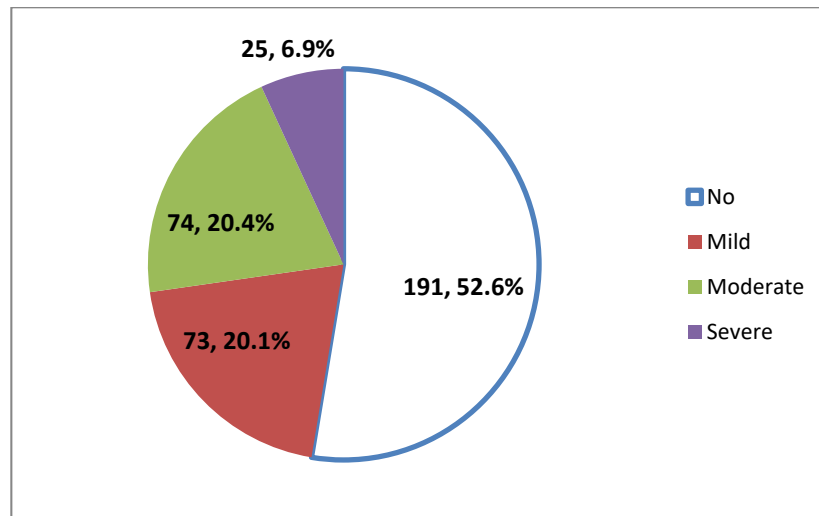
As for factors that significantly associated with depression were the patients' gender (p= 0.002), marital status (p=0.001), family history of depression (p= 0.001), level of glycated haemoglobin (p=0.030), level of fasting blood glucose (p=0.023), history of insulin therapy (p=0.014), number of daily taken drugs other than those of DM (p=0.004), compliance with the therapy and the presence of the diabetic complications (p=0.053, 0.001).

DISCUSSION

It has been documented by Lin et al that the existence of depression in diabetes patients has been often associated with the adverse diabetes outcomes [24], and since there has been no available data regarding the prevalence of depression among the diabetics in Taif region, this study was carried out to investigate the possible link between depression and diabetes and its correlates in Taif city, KSA.

In the current study, the prevalence of depression among the diabetic patients was 47.4%. It was mild among 20.1% of them, moderate among 20.4% whereas it was severe among 6.9% of patients. Quite similar results were reported from Makkah, 2010, [25], Riyadh, 2013 [26], However, a lower prevalence rate (14.5%) has been reported in a study carried out by Al-Muzien and Al-Sowielem, 2014 [27] in the Eastern Province of Saudi Arabia.

Internationally, Arshad and Alvi (2016) have reported a prevalence of depression as 38.4% among type 2 diabetic patients in Pakistan, it was mostly mild [28]. In North India, Raval et al (2010) reported a prevalence of 41% of clinically significant depression [29]. In another Indian study, Joseph et al reported a rate of 45.2% among type 2 diabetic patients , mostly of the moderate depression [30]. In Iran, Khamseh et al (2007) reported a prevalence of depression as 71.8% among the patients with diabetes (both types; type 1 and type 2) [31].

Several studies conducted in Saudi Arabia [25, 32] and internationally [29, 30, 33] reported a higher prevalence of depression among the older patients. In disagreement with these studies, the present study did not observe a significant relation between the patients` age and depression.

Female patients were more likely to develop depression and in particular severe depression compared to the male patients in the present study. Similar results have been reported elsewhere [12, 30, 31, 34-36]. However, others did not find an association between gender and depression among diabetics [29, 31].

In the current study, divorced patients were more likely to have depression and particularly severe form. Other studied reported the same findings [37-39]. This could be attributed to the possible lack of the social support among the divorced patients, particularly in the conservative societies. In accordance with others either in Saudi Arabia [25], or outside it [39], the present study confirmed a significant relationship between the family history of depression and developing depression among the diabetic patients.

Poorly controlled diabetes, as evaluated by the levels of fasting blood sugar and glycosylated haemoglobin percentage, was significantly associated with depression, in particular the severe form of depression. This

finding agreed with those of other studies that poorly or uncontrolled diabetes would increase the risk of having depression [25, 39, 40- 42]. On the other hand, other studies [10, 31] did not observe significant differences in the average HbA1C by the depression status.

Self-reported level of the compliance with diabetic therapy was borderline significantly associated with depression in the present study. This finding agreed with those reported by the others [25, 39, 40].

In the current survey, the presence of diabetic complications was a significant predictor for depression. Previous studies confirmed this finding [25, 31, 39, 42]. Also, Lustman et al [43] observed that longer depression period increased the risk of developing diabetic retinopathy as a result of the long periods of poor glycaemic control. Additionally, in a meta-analysis done by De Groot et al, [10] a significant association between diabetic complications and depression was confirmed.

The present study showed a significant association between insulin therapy and depression. In this context, Peyrot and Ruben [44] found that the risk to develop depression increased by forty percent among the diabetics type 2 patients who were using insulin.

Important limitations to the current study included the cross-sectional nature of the study design which only proved the association and not causality, the use of the self-report questionnaires, as it had been reported that the rate of depression was higher in the self-report questionnaires than the psychiatric interviews [45], and finally, carrying out the study in one institution in Taif made it difficult to generalize the findings to the other institutions.

CONCLUSION

Approximately half of Saudi adult diabetic patients of both sexes attended the diabetic center at King Abdulaziz Specialist hospital in Taif city were depressed, mostly of the mild and moderate levels. Factors significantly associated with depression included the patients' gender, marital status, family history of depression, level of glycated haemoglobin, level of fasting blood glucose, history of insulin therapy, number of daily taken drugs other than those of DM, compliance with therapy and presence of the diabetic complications.

RECOMMENDATIONS

1. Organizing a screening program for depression among all the diabetic patients at diabetic centers as well as the primary healthcare centers through trained family physicians particularly for high risk groups (females, uncontrolled, insulin treated and complicated patients).
2. Referring the diabetic patients suffering from severe depression to the psychiatrists as early as possible.
3. Conducting educational programs for physicians who are responsible for diabetic care to update their knowledge regarding the psychiatric aspects of their patients.
4. Creating a line of communication between the psychiatrists and physicians in diabetic centers.
5. Reducing the risk of the diabetes complications
6. Conducting further studies to include the patients from other institutions in Taif city.

REFERENCES

1. King H, Auburt RE, Herman WH. Global burden of diabetes 1. 1995-2025: prevalence, numerical estimates, and projections. Diabetes Care 1998; 21: 1414-31.
2. Al-Nozha MM, Al-Maatouq MA, Al-Mazrou YY, Al-Harthi SS, Arafah MR, Khalil MZ, et al. Diabetes mellitus in Saudi Arabia. Saudi Med J 2004; 25: 1603-1610.
3. World Health Organization. Depression. Fact sheet No. 369, 2015.
4. Sharp LK, Lipsky MS. Screening for Depression across the lifespan: a review of measures for use in primary care settings. Am Fam Physician. 2002 Sep 15; 66(6): 1001-1009.
5. Anderson RJ, Freedland KE, Clous RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: a meta-analysis. Diabetes Care 2001; 24: 1069–1078.
6. Ali S, Stone MA, Peters JL, Davies MJ, Khunti K. The prevalence of co-morbid depression in adults with type 2 diabetes: a systematic review and meta-analysis. Diabet Med 2006; 23: 1165–1173.

7. Dunbar JA, Reddy P, Davies-Lameloise N, Philpot B, Laatikainen T, Kilkkinen A, et al. Depression: an important co-morbidity with metabolic syndrome in a general population. Diabetes Care 2008; 31: 2368–2373.

8. Reddy P, Philpot B, Ford D, Dunbar JA. Identification ofdepression in diabetes: the efficacy of PHQ-9 and HADS-D. British Journal of General Practice, June 2010 e239-e245

9. American Diabetes Association. Depression. Available from: URL: http://www.diabetes.org.

10. De Groot M, Anderson R, Freedland KE, Clouse RE, Lustman 4. PJ. Association of depression and diabetes complications: a meta analysis. Psychosomatic Med 2001; 63 : 619-30.

11. Egede LE, Zheng D, Simpson K. Comorbid depression is associated with increased health care use and expenditures in individuals with diabetes. Diabetes Care 2002; 25 : 464-70.

12. Katon WJ, Simon G, Russo J, Von Korff M, Lin EH, Ludman E, et al. Quality of depression care in a population-based sample of patients with diabetes and major depression. Med Care 2004; 42: 1222-9.

13. Lin EH, Katon W, Von Korff M, Rutter C, Simon GE, Oliver M, et al. Relationship of depression and diabetes self-care, medication adherence, and preventive care. Diabetes Care 2004; 27 : 2154-60.

14. Katon WJ, Rutter C, Simon G, Lin EH, Ludman E, Ciechanowski P, et al. The association of comorbid depression with mortality in patients with type 2 diabetes. Diabetes Care 2005; 28 : 2668-72.

15. Regen F, Merkl A, Heuser I, Dettling M, Anghelescu I. Diabetes and depression. Dtsch Med Wochenschr 2005; 130 (17):1097-1102.

16. Black SA, Markides KS, Ray LA. Depression predicts increased incidence of adverse health outcomes in older Mexican Americans with type 2 diabetes. Diabetes Care 2003; 26 : 2822-8.

17. Arroll B, Goodyear-Smith F, Crengle S, Gunn J, Kerse N, Fishman T, Falloon K, Hatcher S. Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. Ann Fam Med. 2010; 8(4):348-53.

18. Nease DE Jr, Maloin JM. Depression screening: a practical strategy. J Fam Pract. 2003; 52(2):118-124.

19. Campbell KB, Braithwaite SS. Hospital Management of Hyperglycemia. Clinical Diabetes 2004; 22 (2): 81-88.

20. Gallagher EJ, Bloomgarden ZT, Le Roith D. Review of hemoglobin A1c in the management of diabetes. Journal of Diabetes, 2009, 1: 9-17.

21. Abdel-Khalek AM. Internal consistency of an Arabic Adaptation of the Beck Depression Inventory in four Arab countries. Psychol Rep 1998; 82(1):264-266

22. Beck A, Steer R, Brown G. BDI-II Manual. San Antonio: The Psychological Corporation, Harcourt Brace; 1996.

23. Lasa L, Ayuso-Mateos JL, Vazquez-Barquero JL, Díez-Manrique FJ, Dowrick CF. The use of Beck Depression Inventory to screen for depression in the general population: a preliminary analysis. J Affect Disord 2000; 57: 261–265.

24. Lin EHB, Rutter CM, Katon W, Heckbert SR, Ciechanowski P, Oliver MM, et al. Depression and advanced complications of diabetes. Diabetes Care. 2010; 33(2):264-269.

25. Trabulsi FA, Almasaodi KA. Depression among type 2 diabetic patients in Al-Eskan Avenue in Makkah, 2010. American Journal of Research Communication. 2013; 1(10): 49-68

26. AL-Baik MZ, Moharram MM, Elsaid T, Al-Baik S, AlDahan S, Alkhadhrawi N, et al. Screening for depression in diabetic patients. Int J Med Sci Public Health 2014; 3:156-160.

27. Al-Muzien NA, Al-Sowielem LS. Prevalence of depression in diabetics attending primary healthcare centers in the Eastern Province of Saudi Arabia. J Bahrain Med Soc 2014; 25(1): 14-18

28. Arshad AR, Alvi KY. Frequency of depression in type 2 diabetes mellitus and an analysis of predictive factors. Population. 2016; 6:7.

29. Raval A, Dhanaraj E, Bhansali A, Grover S, Tiwari P. Prevalence & determinants of depression in type 2 diabetes patients in a tertiary care centre. Indian J Med Res. 2010 Aug;132:195-200.

30. Joseph N, Unnikrishnan B, Babu YPR, Kotian MS, Nelliyanil M. Proportion of depression and its determinants among type 2 diabetes mellitus patients in various tertiary care hospitals in Mangalore city of South India. 2013; 17(4):681-688

31. Khamseh ME, Baradaran HR, Rajabali H. Depression and diabetes in Iranian patients: a comparative study. Int J Psychiatry Med. 2007; 37(1): 81-86

32. Almawi W, Tamim H, Al-Sayed N, Arekat MR, Al-Khateeb GM, Baqer A, et al. Association of comorbid depression, anxiety, and stress disorders with type 2 diabetes in Bahrain: a country with a very high prevalence of type 2 diabetes. J Endocrinol Invest. 2008; 31(11): 1020-4.

33. Larijani B, Shahi Bayat MK, Gorgani MK, Bandarian1 F, Akhondzadeh S, Sadjadi SA. Association Between Depression and Diabetes. German J Psychiatry 2004; 7: 62-65.

34. Katon W, Von KM, Ciechanowski P, Russo J, Lin E, Simon G, et al. Behavioral and clinical factors associated with depression among individuals with diabetes. Diabetes Care 2004; 27: 914-920.

35. Zahida N, Asghara S, Claussena B, Hussaina A. Depression and diabetes in a rural community in Pakistan. Diabetes Research and Clinical Practice 2008; 79(1):124-127.

36. Al-Amera RM, Sobehb MM, Zayedc AA, Al-domid HA. Depression among adults with diabetes in Jordan: risk factors and relationship to blood sugar control Journal of Diabetes and Its Complications 2011;25:247-252

37. Zhang CX, Chen YM, Chen WQ: Association of psychosocial factors with anxiety and depressive symptoms in Chinese patients with type 2 diabetes. Diabetes Res Clin Pract. 2008, 79: 523-530.

38. Zhang J, Ye M, Huang H, Li L, Yang A: Depression of chronic medical inpatients in China. Arch Psychiatr Nurs. 2008, 22: 39-49.

39. Tellez-Zenteno JF, Cardiel MH: Risk factors associated with depression in patients with type 2 diabetes mellitus. Arch Med Res. 2002, 33: 53-60.

40. Al Mouaalamy NA. Prevalence of depression among type 2 diabetic patients atteding diabetic clinic at primary health care centers in Jeddah 2004-2005 [dissertation]. Joint Programme of Family and Community Medicine, Jeddah – KSA, 2005.

41. Egede LE, Ellis C. Diabetes and depression: Global perspectives. Diabetes Research and Clinical Practice 2010; 87:302–312

42. Xu L, Ren J, Cheng M, Tang K. Depressive symptoms and risk factors in Chinese persons with type 2 diabetes. Arch Med Res 2004; 35(4):301-7.

43. Lustman P, Anderson R, Freedland K, de Croot M, Carney R, Clouse R. Depression and poor glycemic control. Diabetes Care 2000; 23:934-942.

44. Peyrot M, Rubin RR. Persistence of depressive symptoms in adult diabetic patients. 1999; 22(3): 448-452.

45. Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: a meta-analysis. Diabetes Care 2001; 24(6): 1069-1078.