Health Care: Current Reviews
ISSN: 2375-4273

Ornelas et al., Health Care Current Reviews 2017, 5:4
DOI: 10.4172/2375-4273.1000216

Review Article Open Access

Mental Disorders in Subjects with Diabetes: A Systematic Review

Ornelas ACC[1,2]*, Alves VM[3], Carta MG[4], Nardi AE[5,6] and Kinrys G[7]

[1]*Laboratory of Panic and Respiration, Institute of Psychiatry, Universidade Federal do Rio de Janeiro, Brazil,*
[2]*Massachusetts General Hospital-Bipolar Clinic and Research Program (BCRP), Havard University, USA*
[3]*Alagoas University Federal, Institute of Psychiatry, Universidade Federal do Rio de Janeiro, Brazil*
[4]*Quality of Care and Applied Medical Technologies, Department of Public Health, Clinical and Molecular Medicine, University of Cagliari, Italy*
[5]*Laboratory of Panic and Respiration-Institute of Psychiatry, Universidade Federal do Rio de Janeiro, Brazil*
[6]*Department of Public Health, Clinical and Molecular Medicine, University of Cagliari, Italy*
[7]*MGH Clinical Trials Network and Institute (CTNI), Bipolar Clinic and Research Program (BCRP), Massachusetts General Hospital, Harvard Medical School, USA*

Abstract

Depression has been a common comorbidity and reduces the quality of life, the poor glycemic control and consequently worsens the diabetes course. The goals of this systematic review are searching of a population who have higher mental disorders in type 1 and 2 patients with diabetes and if there is a direct relationship between glycemic control and psychiatric disorders in this population. A total of 2527 references, review and review articles were excluded, 19 scientific studies were selected: 9 cross-sectional studies, 6 prospective observational studies, 3 retrospective observational studies, and 1 case-control study. Depression and anxiety have a high prevalence in subjects with diabetes. Therefore, the relevance of this study is showing that those mental disorders have a direct correlation in both types of diabetes treatments and decrease the quality of life. Also, the rates of depression could be up to three times higher in patients with type 1diabetes and twice as high in individuals with type 2 diabetes compared with the general population. Patients live in fear of complications from diabetes over the long term and also have damage due to the high psychiatric comorbidity of these chronic patients.

Keywords: Mental disorder; Diabetes; Anxiety; Depression; Quality of life

Introduction

Chronic diseases cause more than 50% of deaths worldwide [1,2]. Furthermore, it is estimated that deaths from chronic diseases will increase by 15% in the next 10 years [1-4]. Mood and Anxiety disorders have highly prevalent conditions in diabetes and have a significant impact on health outcomes [5,6]. Most relevant lifestyle factors are related to another-physic comorbidity as well, which warrants their evaluation when examining the association between quality of life, depression and adverse health outcomes in this chronic disease [5-7]. The American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (DSM-5) describes diabetes as a correlation of mood disorder and join several symptoms that cause severe dysfunctionality of an individual [8]. People with diabetes have considerable disadvantages in their emotions, cognition, and behaviors decreased by depression symptoms [9]. Actually, core symptoms like an irritable mood or reduced pleasure as an anhedonia or both. Therefore, feelings of guilt or worthlessness; fatigue or loss of energy; concentration problems; suicidal thoughts or ideation; weight loss or weight gain (around 5% change in weight); psychomotor retardation or change in activity like a slowdown and hypersomnia or insomnia lasting during 2 weeks are diagnostic criteria for a Major Depressive Disorder [8]. Depression could be described as a first episode, a recurrent or chronic episode; could be mild, moderate or severe, with or without psychotic features [8]. Study of depression as a predictor and it is moderately increased in undiagnosed in people who have diabetes or prediabetes, also increases the diabetes previously diagnosed compared to normal glucose metabolism individuals [9,10]. Anxiety appears at least, in 40% of patients with Type 1/2 diabetes [10]. In study about psychiatry disorders in patients who have diabetes show of emotional disorders (29%), depression (27%), anxiety (47%) and low quality of life (physical component score=46, SD=11.2; mental component score=36, SD=13.9, $p<0.001$ for difference) [11]. Emotional distress like injury, humiliation, worry, and fear, and may curtail routine activities such as driving or socializing are pervasive and under-addressed by health care providers [10,11]. Therefore, the consequences are increasing their anxiety and having social episodes of hypoglycemia. Patients' family members are also negatively impacted by uncontrolled patients with Type 1/2 diabetes. There is 50% risk of having a mental health problem in life, and this leads to being unemployed or unproductive people [10]. The same study described other relevant results which depression and anxiety disorders are the 4th cause, while diabetes is the 8th cause of disability-adjusted life years (DALYs) in developed countries. Depression was more prevalent among individuals with diabetes (20%) when was compared with asthmatics (12%) and patients without diabetes (4%), while anxiety was more prevalent among asthmatics (34%) than patients with diabetes (20%) and healthy individuals (8%). Predictors of depression include demographic dates, since the age of the patient, social status, poor glycemic control and duration of diabetes mellitus [10]. The goals of this study are showing the higher prevalence in psychiatric disorders and how those disorders can influence in the quality of life in patients with Type 1/2 diabetes and compare if there are differences of those comorbidities in both types.

Materials and Methods

A systematic review was conducted in PubMed, Embase and ISI Web of Science, following the recommendations of the Preferred Items for Reporting of Systematic Reviews and Meta-Analyses (PRISMA)

***Corresponding author:** Ana Claudia De Ornelas, Havard University, Psychiatry 113, OAKLAND ST UNIT 2, Malden, Massachusetts 02148, United States, Tel: 18575235004; E-mail: psianaornelas@gmail.com

Received November 24, 2017; **Accepted** December 10, 2017; **Published** December 17, 2017

Citation: Ornelas ACC, Alves VM, Carta MG, Nardi AE, Kinrys G (2017) Mental Disorders in Subjects with Diabetes: A Systematic Review. Health Care Current Reviews 5: 216. doi: 10.4172/2375-4273.1000216

statement [12]. The search terms used were "diabetes", "mental", "disorders", "depression", "anxiety", "comorbity", "quality of life" and "psychiatric". The research took place in March, 2017 and no time restriction was placed on any of database searches. Manual searches were also conducted using the reference lists from identified articles. Review and theoretical articles were excluded, and 19 scientific studies were selected.

Results

A total of 2537 references were searched in 3 data bases: 1685 Embase, 774 PubMed and 78 ISI Web of Science. A total of 349 were excluded because they were duplicates or were not in English. The abstracts of the 2188 remaining references were analyzed and after reading them 19 full text analyses were selected to write this systematic review. Those nineteen articles (Table 1) matched the inclusion criteria of "Mental disorders in subjects with diabetes: a systematic review" being an observational cohort studies, about comorbidity in mental health and including a study population of patients with Type 1/2 diabetes. According to the methodological design as shown in Figure 1, there were 9 cross-sectional studies, 6 prospective observational studies, 3 retrospective observational studies and 1 case-control study.

Date	Authors	Title	Sample	Delimitation	Method / Instruments	Abstract
2011	Chaudhry et al. [22]	Psychiatric morbidity among patients with diabetes: a hospital-based study	100	Observational prospective cohort study	HAM-A HAM-D	Patients with diabetes are more prone to comorbid disorders like depression and anxiety, 84% of the patients had comorbid depression. Females showed a high percentage of depression and anxiety than male and the severity level was also higher in the females as well.
2012	Atlantis [29]	Excess burden of type 1 and type 2 diabetes due topsychopathology	48359	Observational retrospective cohort study	Kessler Psychological Distress Scale	The prevalence of type 2 diabetes when was compared with type 1 increased by 36% between 2001 and 2008. Odds ratios with 95% CI for type 1/2 diabetes ranged from 1.43 (0.98, 2.10) to 2.44 (1.63, 3.64) and 1.32 (1.13, 1.53) to 1.67 (1.39, 2.02) for people with compared to those without psychopathology. Lifestyle is a risk factor to inform practice for more effective management and treatment plan.
2012	Maia et al. [13]	Prevalence of psychiatric disorders in patients with types 1 and 2 diabetes	200	Observational cross-sectional Cohort Study	MINI International Neuropshychiatric Interview	There is a high prevalence of psychiatric disorders in patients with diabetes. The main goal of this study was pointing to the need for a greater investment in appropriate diagnostic evaluation of patients that considers mental issues. Some mental disorders, like GAD, Depression and Social Phobia are more common in type 1 diabetic
2012	Bener et al. [14]	Prevalence, symptom patterns and comorbidity of anxiety and depressive disorders in primary care in Qatar	2080	Observational Cross Sectional Cohort Study	HADS-A HADS-D	Depression was more prevalent in the population who has diabetes than anxiety disorders. Women were likelier than men to have depression and anxiety disorders. The high-risk groups of depression and anxiety disorders were female gender, being married, middle aged and highly educated.
2013	Niraula et al. [15]	Prevalence of depression and associated risk factors among persons with type-2 diabetes mellitus without a prior psychiatric history: a cross-sectional study in clinical settings in urban Nepal	385	Observational cross-sectional Cohort Study	BDI	40.3% of individuals with diabetes were depressive. This study provides a primary care is essential as a treatment for a causal pathway from diabetes to depression. Integration of mental health services will be important to combat development of depression among those patients.
2013	Bernstein et al. [39]	Mental health issues in adolescents and young adults with type 1 diabetes: prevalence and impact on glycemic control	150	Observational cross-sectional cohort study	BDI Child Anxiety Related Emotional Disorders Inventory Eating Disorder Screen for Primary Care Instrument	This study supports screening for mental health issues in adolescents and young adults with type 1 diabetes. More than a third screened positive: 11.3% for depression, 21.3% for anxiety and 20.7% for disordered eating (14.7% had ≥ 2 positive screens).
2013	De Ornelas et al. [16]	Comorbidity of Depression and Anxiety: Association with Poor Quality of Life in patients with Type 1 and 2 diabetes	210	Observational Cross-sectional Cohort Study	HADS WHOQOL-BREF	Groups showed a high prevalence of anxiety (type 1=60%, type 2=43.8%) and depression (type 1=52.4%, type 2=38.1%), both measures were significantly higher ($p<0.05$) in patients with diabetes type 1. In overall patients with diabetes depression and anxiety seems to be a determinant of poor QoL.
2014	Van Dijk PR et al. [44]	Fifteen-year follow-up of quality of life in type 1 diabetes mellitus	283	Observational Prospective cohort study	SF-36 EuroQol	Among patients with diabetes on treatment with insulin have decreased significantly over time: mental component summary [-9.8 (-16.3, -3.2)], physical component summary [-8.6 (-15.3, -1.8)] and EuroQol-VAS - scale [-8.1 (-14.0, -2.3)], $P<0.05$ for all.

2014	Dos Santos et al. [31]	Anxiety disorders are associated with quality of life impairment in patients with insulin-dependent type 2 diabetes: a case-control study	996	Caso control Study	MINI International Neuropsychiatric Interview WHOQOL-BREF	Type 2 patients had a higher prevalence of generalized anxiety disorder, panic disorder and obsessive-compulsive disorder. These disorders in combination with type 2 diabetes was associated with worse quality of life in the physical, social, psychological and environmental domains.
2014	Maia et al. [17]	Psychiatric comorbidity in type 1 diabetes: a cross-sectional observational study	110	Cross-sectional Observational Study	MINI International Neuropsychiatric Interview HADS	Prevalence of anxiety symptoms in 60% and 53.6% of depression in a sample of 110 type 1 patients. The most remarkable data were generalized anxiety disorder (22.7%), dysthymia (18.2%), panic disorder (8.2%) and social phobia (5.5%). Presence of symptoms related to psychopathology in patients with type 1 diabetes is evident.
2015	Tüzün et al. [18]	Impact of comorbidity and socioeconomic status on quality of life in patients with chronic diseases who attend primary health care centers	2560	Cross-sectional Observational Study	WHOQOL-BREF Primary Care Questionnaire	Mental disorders and diabetes-hypertension comorbidity had the most negative effect on the QoL. The effect of diabetes-hypertension comorbidity is greater than the additive effect of hypertension and diabetes individually.
2015	Handley et al. [19]	Suicidal ideation reported by adults with Type 1 or Type 2 diabetes: Results from Diabetes MILES-Australia	3338	Observational cross-sectional cohort Study	Problem Areas In Diabetes scale Patient Health Questionnaire	Type 2 diabetes patients using insulin reported more frequent depressive symptoms, and were more likely to report recent Suicide Ideation (19%) compared with those with either Type 1/2 diabetes patients not using insulin (14 and 12%, respectively).
2015	Gemeay et al. [30]	The association between diabetes and depression	100	Retrospective Cohort Observational Study	MINI International Neuropsychiatric Interview BDI	More than 37% individuals with type 1/2 in diabetes had depression. This study revealed that there is an association between diabetes and depression although the correlation between depression and diabetes was not significant is this study, while there was found a significant relation with changes in body image.
2015	Bajor et al. [23]	Associations between comorbid anxiety, diabetes control and overall medical burden in patients with serious mental illness and diabetes	157	Prospective Cohort Observational Study	Self-Reported Charlson Index MINI International Neuropsychiatric Interview	33.1% of Individuals who have anxiety disorders were with serious mental illness and type 2 diabetes and were associated with increased severity of depressive symptoms and decreased function.
2016	van Dooren et al. [20]	Psychological and personality factors in type 2 diabetes mellitus, presenting the rationale and exploratory results from The Maastricht Study, a population-based cohort study	864	Cross-sectional Observational Study	Mini International Neuropsychiatric Interview PHQ-9 Generalized Anxiety Disorder Scale Dutch Personality Disorder Scale	Study found more psychological distress and has different personality in patients with diabetes type 2 compared to the general population. Type 2 diabetes self-management is known to be burdensome, as it requires discipline and perseverance to adapt every day activities (diet, exercise, rest) to medication use and glucose levels and Insulin therapy, particularly, may be associated with increased psychological distress.
2016	Shin et al. [24]	Help-seeking behaviors for serious psychological distress among individuals with diabetes mellitus: The California Health Interview Survey, 2011-2012	40803	Prospective Cohort Observational Study	California Health Interview Survey	The prevalence of Diabetes and psychological distress were 10.9% and 3.4%, respectively, among participants in this research. The patients with Diabetes were more likely to experience serious psychological distress than those without Diabetes (OR 1.46, 95% CI=1.11-1.91, p=0.006).
2016	Chien and Lin [25]	Increased risk of diabetes in patients with anxiety disorders: A population-based study	1000000	Prospective Cohort Observational Study	NHRI (data bases)	In patients with diabetes, anxiety disorders were higher than that in the general population (11.89% vs. 5.92%, odds ratio, 1.23; 95% confidence interval, 1.17-1.28) in 2005. The average annual incidence of diabetes in patients with anxiety disorders was also higher compared to the general population (2.25% vs. 1.11%, risk ratio 1.34; 95% confidence interval, 1.28-1.41) from 2006 to 2010. Patients with anxiety disorders revealed a higher incidence of diabetes in all age groups among both females and males.
2016	Garcia et al. [26]	Diabetes Mellitus as a Risk Factor for Development of Depressive Symptoms in a Population-Based Cohort of Older Mexican Americans	1586	Prospective Cohort Observational Study	Center for Epidemiologic Studies Depression Scale (CES-D)	Diabetes mellitus increased the risk of developing depressive symptoms in older Mexican Americans. Older Latinos with diabetes mellitus. They should be screened for depressive symptoms and prioritized for close follow-up, potentially through greater reliance on team-based models of care.

Table 1: Published studies based on Mental disorders in subjects with diabetes: a systematic review.

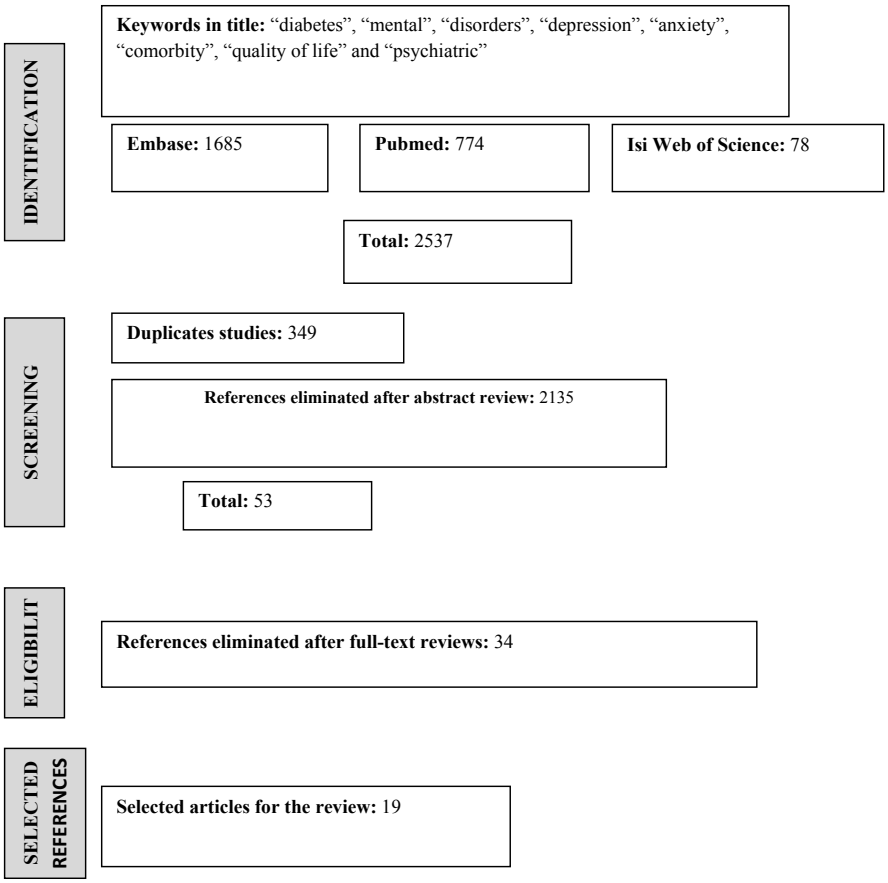

Figure 1: Results of the systematic review in "The higher prevalence of mental disorders in diabetic patients".

Cross-sectional studies [9]

Maia et al. [13] discovered that of the 200 patients with diabetes who presented each of the psychiatric disorders identified, with percentages in decreasing order, like 21% of them had GAD (Generalized anxiety disorder); 15% dysthimia; 7% social phobia; 5.5% current depression; 2.5% panic disorder and 2% risk of suicide. Of the 200 patients 42.5% were found to have at least 1 psychiatric disorder [13]. In the same year, researchers studied about anxiety symptom in patients with diabetes and HADS-A scores were 4.1 ± 3.6 for males and 4.9 ± 3.7 for females (p=0.048) and with a prevalence of 18.7% among males and 24.6% among females (p=0.017), HADS-D depressive symptom scores were 8.0 ± 6.3 for males and 10.8 ± 7.5 for females (p=0.041) and with a prevalence of 26.6% among males and 30.1% among females (p= 0.219). There are evidences that depression has a higher risk in femme population (53.1 vs. 46.9%) and anxiety disorder (56.7 vs. 43.3%) as compared to men. Results were for anxiety (56.7%) and depression (53.1%) in women group who was 18-34 years [14]. Niraula et al. [15] showed in 385 patients with diabetes and clinical depression was 40.3% of the total sample. Among those depressed patients, 48.2% were female and 31.7% were male. Sexual functioning were described in this study (χ^2= 10.91, df = 383, p< 0.001) as significantly associated to depression disorder. In other study in this year, it was observed in 150 patients, 34.7% reported positive on at least 1 of the depression inventory, anxiety, and eating disorder; 14.7% screened positive on 2 of the instruments. 11% of participants resulted positive for depression. Results showed that 21% of participants had scores for an anxiety disorder and, finally, 20.7% reported eating disorder [15]. De Ornelas et al. in 2013 [16], reported 210 patients who were evaluated and divided in two groups, patients with Type 1/2 diabetes. This study showed that patients with type 1 have 60.3% of anxiety and 67.3% of depression compared with type 2 anxiety (52.1%) and depression (52.3%). However, these patients presented decreased quality of life (F=11.78; p<0.001), whether in their overall assessment or in any of physical (F=11.77; p<0.001) and psychological (F=7.40; p<0.001) domains [16].

In other research, 110 individuals with type 1 diabetes, Maia et al. [17] found 22.7% GAD; 18.2% Dysthymia; 8.2% Current Depression; 5.5% Panic Disorder; 5.5% Social Phobia and 4.5% life-long depression as psychiatric comorbidity. These findings of anxiety generalized disorder and dysthymia in this population were highlighted in this study [17]. Tüzün et al. [18] observed in 74 patients poor quality of life when means were described 65.6 physical; 61.9 psychological; 61 social relationship and 58.9 environmental domains. Otherwise, means were 53.2; 55.8; 55.2 and 54.5, respectively in 51 patients with diabetes and hypertension as well. Handley et al. in 2015 [19], published significant results about depression and suicide ideation among participants with Type 2, insulin-using (M=27.98; p<0.001). Between those participants the criteria for likely depression was 38-43% than among those with no/mild depressive symptoms were 5-7%. Evidently, depressive symptoms also were significantly stronger in participants who were reporting suicide ideation [M=13.1 ± 5.5] than those who did not those kind of ideation [M=5.1 ± 4.5; F (1, 3281)=1203.9; p<0.001] [19].

Van Dooren et al. [20] reported a research with 864 patients with Type 1/2 diabetes had higher levels of depressive and anxiety symptoms, odds ratios (95% CI) were 3.15 (1.49; 6.67), 1.73 (0.83-3.60), 1.50 (0.72-3.12), for PHQ-9 ≥ 10, current depressive disorder and GAD-7 ≥ 10, respectively. In the same year, Sun et al. [32] studied 893 participants and found 56.1% of anxiety symptoms and 43.6% of depressive symptoms. The highest anxiety scores were more prevalent in women, with lower social status and income, chronic disease, depression and poor sleep quality. Finally, Prinz et al. [21], screened 48700 patients with diabetes have 41.5% of depression, anxiety/obsessive-compulsive disorder (41.4%) or needle phobia (75.8%) compared with patients without diabetes (34.6%) had significantly correlation (p<0.05). Patients who had not mental disorders presented depression scores (8.2%), anxiety/OCD (6.0%), or needle phobia (5.3%) [21].

Prospective Observational Studies [6]

Chaudhry et al. [22] showed that overall 84% of subjects with diabetes had comorbid depression. They found that moderate to severe depression was more prevalent in females (71.43%) compared as males (54.55%). About anxiety, male had a higher percentage in mild symptoms (81.8%) compared as females (66.7%), whereas a moderate to severe level of anxiety symptoms is two-times higher in females (39.25%) compared as males (18.18%) [22]. Bajor et al. [23] studied a sample of 157 people with diabetes, roughly half (N=77) carried a diagnosis of major depression, with the remainder divided evenly between schizophrenia disorder (N=40) and bipolar disorder (N=40). Fifty-two (33.1%) had at least one comorbid anxiety diagnosis [23].

Shin et al. [24] screened that 51.6% patients with diabetes had mental/emotional disorder or alcohol/drug abuse, 37.4% participants with diabetes and serious psychological distress sought help from general practitioner/primary care physician, while 31.1% did from mental health providers. Although, patients with diabetes are more likely to take medication for mental health (57.9% vs. 53.8%) the findings showed that were less likely to perceive that they need to see a therapist or psychiatrist compared to those with serious psychological distress only (54.7% vs. 67.8%, p=0.02) [24]. Chien and Lin [25] found in a sample of 1000000 individuals with diabetes that anxiety disorder was higher than that in the general population (11.89% vs. 5.92%, odds ratio, 1.23; 95% confidence interval, 1.17-1.28). The average annual incidence of population who has diabetes with anxiety disorders was also higher than that in the general population (2.25% vs. 1.11%, risk ratio 1.34; 95% confidence interval, 1.28-1.41) from 2006 to 2010 [25].

In 2016, Garcia et al. [26], studied in 1586 patients with diabetes who had a 35% higher rate of depressive symptoms or starting treatment with an antidepressant (hazard ratio (HR)=1.35, 95% confidence interval (CI)=1.13-1.62). Results were associated with a lower rate of regression from depressed to normal (HR=0.72, 95% CI=0.59-0.88) and a 2.3 greater rate of progression from depressed to death (HR=2.31, 95% CI=1.57-3.40) [26]. The last prospective study in 2016, Whitworth et al. [27] reported the significant correlation of severe psychological symptoms in GAD and Major depressive disorder (MDD) with high hyperglycaemical in type 2 diabetes. The authors showed in 1285 individuals with diabetes type 2 had mild severe depressive symptoms (34.2%) and 15.7% were using antidepressant drugs in the baseline. There was a higher correlation in lifetime major depression disorder with current depression symptom (B=3.16, p<0.001). The presence of lifetime GAD was associated with the severe current depression, as well, when patient had high hyperglycaemical (p<0.001) [27].

Retrospective Observational Studies [3]

Solli et al. [28] evaluated about comorbidities and quality of life in 1000 participants with diabetes. The main goal of this study was use EQ-5D instrument, because it has five dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) and three levels on each dimension, and has previously been used in diabetes patients. In total 10% of type 1 patients with diabetes had problems with mobility as judged from the EQ-5D, 3% with self-care, 19% with usual activities, 34% with pain/discomfort and 35% with anxiety/ depression. For type 2 subjects with diabetes were 26%, 6%, 25%, 45% and 33%, respectively [28].

Atlantis found a great association in psychopatology and diabetes since Census 2001. According this study, changes over time, specifically in socio-demographic and lifestyle covariates, the strength of these odds ratios were attenuated and ranged from 1.32 (0.90-1.95) to 2.24 (1.49-3.36) and 1.16 (0.99-1.36) to 1.51 (1.24,1.83) for patients with type 1/2 diabetes. On average, those patients from 1.43 (0.98-2.10) to 2.44 (1.63-3.64) and 1.32 (1.13-1.53) to 1.67 (1.39-2.02) for population without psychopathology by any definition independent of socio-demographic covariates, consistently over the 8-year period (odds ratios with 95% confidence intervals (95% CI) [29]. Gemeay et al. [30] in a sample of 100 patients with diabetes discovered that more than 37% from Type 1 and 37.9% from Type 2 patients have severe depression. Those results reported that, although there was no statistically significant difference correlation between patients with Type 1/2 diabetes and level of depression (p=0.040). Concerning the relation between patient's perceptions of changes in body image, indicates that more than 50% of type 1 patients were anxious regarding changes in body image, while 2.3% from gestational diabetes felt that their appearance has negatively changed. Among patients without diabetes and types, 48% of the individuals follow the treatment regimen, while 25% from the gestational diabetes group never complied. In the same study, concerning late insomnia as a symptoms of depression and types of diabetes, one-third from Type 2 (34.5%) either wake up early in the morning and cannot fall back to sleep, or have no difficulty to sleep again. While more than half (59.3%) from diabetes Type 1 wake up early in the morning and easily come back to sleep and 43.2% of those individuals from the gestational diabetes group wake up early in the morning and cannot fall back to sleep [30].

Case Control [1]

Dos Santos et al. [31] compared type 2 patients with diabetes and patients without diabetes and found presence of GAD, (OR=1.77; p<0.001), panic disorder or agoraphobia (OR=2.31; p<0.001) and OCD (OR=2.47; p<0.001), with the presence of social phobia being statistically similar between the two groups (p=0.273). This research reported higher significantly correlation and also an interaction between diabetes and panic disorder, resulting in poorer quality of life in the physical (F=372.2; p<0.001), psychological (F=148.2; p<0.001), social (F=514.0; p<0.001) and environment domains (F=374.1; p<0.001). Other important results were for social phobic patients with diabetes had lower scores in all four quality of life domains (physical (F=1706.1; p<0.001), psychological (F=245.9; p<0.001), social (F=10.2; p<0.001) and environment (F=660.1; p<0.001)). In OCD patients with diabetes scores decreased physical (F=392.5; p<0.001), psychological (F=85.0; p<0.001) and environment (F=184.2; p<0.001) domains; however, scores within the social skills were increased (F=6.6; p<0.01) [31].

Discussion and Conclusion

In these present exploratory results of mental disorders in subjects with diabetes about anxiety symptoms and anxiety disorders [14-16,18,23-26,32], we found some relevant points. There was a high prevalence in social phobia, panic disorders or agoraphobia, psychological distress, OCD and GAD in type 1 patients with diabetes compared with type 2 [14-16,21,31,32]. Type 1 population with diabetes appears since childhood and it possible that increase in glucose and indicated as predictive of high anxiety [18,23-30]. Also, they must have frequent self-monitoring and reasonable application of injectable insulin by the glucose level may contribute to this higher prevalence of anxiety present in type 1 patients [30,31]. As the results of this study showed, both types require a warning for the treatment of that emotional disturbance [14,15,26,32]. Worry about the future is common in patients with diabetes [14-16,21,31,32,33]. All of the time, they can get in troubles with effort, money, and stress have an emotional influence on individual stability and introduce psychiatry disorders. Anxiety disorders cause excessive anxiety and worry about the situation of life, usually without an apparent cause. It is necessary a more rigorous treatment during the chronic phase of the disease, with the purpose of preventing other physiological and emotional comorbidities over patients' lifetime. On a relevant point of this study was insulin helps the body use glucose as an energy source. In insulin resistance, there are inaccuracies in cells about the efficient use of hormone, resulting in high blood sugar [9,34].

Diabetes occurs when the body due to the absence of insulin production or the cells does not adequately use the insulin [9]. Diabetes may be more contribute to depression because of an interaction between high blood sugar levels and a neurotransmitter associated with depression, in this population. The study found that women with depressive symptoms had a 17% higher risk of developing diabetes and women who use antidepressants had a 25% higher risk of developing diabetes than those who had not depressive symptoms [35]. This study also found that women with diabetes had a 29% higher chance of depression and women use insulin had a 53% higher risk of depression compared with women patients without diabetes [35-41]. When insulin is not working well, high blood sugar levels build in the body and the consequence of that is comorbidity in several areas, eyes, heart and mental disorders. The association between depression symptoms and mood disorders with diabetes was found in several studies [14-18,20-23,26,28,30,32,42]. Specifically were cited in studies there were 18.2% participants with Dysthymia [14,17,18]. Current 8.2% with depression 52% with Major depression as comorbidity in diabetes [14,17,23]. Risk of suicide appears as a consequence of those mental disorders in some of those studies [14,15,17,18,30]. Several studies suggest that diabetes doubles the risk of depression compared to those without the disorder [1-4,36,39-42]. The chances to appear symptoms of depression increase with worsening diabetes complications [33,37,38,40-42]. Researchers reported that depression contributes to poorer physical and mental functioning, so a person who has diabetes is less likely to comply with a required diet or medication plan [17,20,28].

In general, endocrinologists when are treating the population with diabetes, wish the success of this quality of life improvement efforts, but they depend on the management will be able to take multiple medicines comprise comprehensive diabetes care. Distress, somatic symptoms, health beliefs, social support and personality traits, can have a direct or indirect impact on individual life with diabetes. Studies were surprising about the overall quality of life in the population with diabetes and their domains physical, psychological, social relationship and environmental [16,19,20,28,29,31,42]. There are other factors affecting recurrent life course in those patients with diabetes included severe depression and anxiety [9,11]. They must have regular exams for evaluation of the eyes, feet, heart, and kidneys; they can contribute to reducing the risk for patients without diabetes [9,11]. It is essential that they learn and understand the self-care and seeking preventive health services regularly. In addition, a study with 1160 individuals with cardiovascular risks and diabetes showed an improvement in their clinical and emotional health. It was a primary health care with doctor monitories (project Leonardo). This project reported a guideline that increased patient health knowledge, self-management skills and readiness to make changes in health behaviors [43]. The most important plan is based on the understanding that emotions and physical health are connected. The evidence in literature means that having a healthy emotional life and excellent coping skills will contribute that population to live longer and with better quality of life. Diabetes causes emotional disorders in all patients, but not in the same way. Differences in psychological factors can be noted in patients with Type 1/2 diabetes, such as problems with anxiety and depression disorders. Also, diabetes also affects all domains of quality of life: physical, emotional, environmental and social. Uncontrolled blood sugar levels lead to substantial psychological distress, negative moods, cognitive difficulties, irritable or aggressive behavior, and closely associated problems with social relationships, self-image and self-confidence.

The patient's age, poor glucose control and the duration of diabetes mellitus are predictors of depression. The hypersomnia or insomnia, depression, anxiety disorders and suicide risk are factors that correlated significantly with the general well-being of patients with diabetes. Depression and medical comorbidities have a direct correlation with the quality of life. Psychiatric diseases have significant effects on patients' quality of life and should have an attention in diabetes treatment as well. Treatment of mental disorders with psychotherapy, medication or a combination of these treatments can improve quality of life and self-care in diabetes.

Acknowledgement

The contribution of all the authors for the project and production of the article was the selection of articles on the web; implementation the text in Mental Health in Patients with Diabetes and revision of the manuscript.

Conflict of Interest

All the authors have no conflict of interest and they didn`t have grant for this research project.

References

1. Alt Y, Grimm A, Schlegel L, Grambihler A, Kittner JM, et al. (2015) The Impact of liver cell injury on health-related quality of life in patients with chronic liver disease. PLoS One 11: e0151200.
2. Park S, Cho MJ, Chang SM, Bae JN, Jeon HJ, et al. (2010) Relationships of sleep duration with sociodemographic and health-related factors, psychiatric disorders and sleep disturbances in a community sample of Korean adults. J Sleep Res 19: 567-577.
3. Jang SI, Lee KS, Park EC (2013) Relationship between current sleep duration and past suicidal ideation or attempt among Korean adolescents. J Prev Med Public Health 46: 329-335.
4. Park JH, Yoo JH, Kim SH (2013) Associations between non-restorative sleep, short sleep duration and suicidality: findings from a representative sample of Korean adolescents. Psychiatry Clin Neurosci 67: 28-34.
5. Chyun DA, Melkus GD, Katten DM, Price WJ, Davey JA, et al. (2006) The association of psychological factors, physical activity, neuropathy and quality of life in type 2 diabetes. Biol Res Nurs 7: 279-288.
6. Lloyd CE, Dyer PH, Barnett AH (2000) Prevalence of symptoms of depression and anxiety in a diabetes clinic population. Diabet Med 17: 198-202.

7. Regier DA, Rae DS, Narrow WE, Kaelber CT, Schatzberg AF (1998) Prevalence of anxiety disorders and their comorbidity with mood and addictive disorders. Br J Psychiatry Suppl 34: 24-28.

8. American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders.

9. Dreber H, Reynisdottir S, Angelin B, Hemmingsson E (2015) Who is the treatment-seeking young adult with severe obesity: A comprehensive characterization with emphasis on mental health. PLoS One e0145273.

10. Badescu SV, Tataru C, Kobylinska L, Georgescu E, Zahiu DM,et al. (2016) The association between Diabetes mellitus and Depression. J Med Life 9: 120-125.

11. Vanstone M, Rewegan A, Brundisini F, Dejean D, Giacomini M (2015) Patient perspectives on quality of life with uncontrolled type 1 diabetes mellitus: A systematic review and qualitative meta-synthesis. Ont Health Technol Assess Ser 15: 1-29.

12. Moher D, Liberati A, Tetzlaff J, Altman DG (2009) Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. PLoS Med 6: e1000097.

13. Maia AC, Braga AA, Brouwers A, Nardi AE, Oliveira e Silva AC (2012) Prevalence of psychiatric disorders in patients with diabetes types 1 and 2. Compr Psychiatry 3: 1169-1173.

14. Bener A, Ghuloum S, Abou-Saleh MT (2012) Prevalence, symptom patterns and comorbidity of anxiety and depressive disorders in primary care in Qatar. Soc Psychiatry Psychiatr Epidemiol 47: 439-446.

15. Niraula K, Kohrt BA, Flora MS, Thapa N, Mumu SJ, et al. (2013) Prevalence of depression and associated risk factors among persons with type-2 diabetes mellitus without a prior psychiatric history: A cross-sectional study in clinical settings in urban Nepal. BMC Psychiatry 13: 309.

16. De Ornelas Maia ACC, Braga AA, Paes F, Machado S, Carta MG, et al. (2013) Comorbidity of depression and anxiety: Association with poor quality of life in type 1 and 2 diabetic patients. Clin Pract Epidemiol Ment Health 9: 136-141.

17. Maia ACCO, Braga AA, Paes F, Machado S, Nardi AE, et al. (2014) Psychiatric comorbidity in diabetes type 1: A cross-sectional observational study. Revista da Associacao Medica Brasileira 60: 59-62.

18. Tuzun H, Aycan S, İlhan MN (2015) Impact of comorbidity and socioeconomic status on quality of life in patients with chronic diseases who attend primary health care centres. Cent Eur J Public Health 23: 188-194.

19. Handley TE, Ventura AD, Browne JL, Rich J, Attia JR, et al. (2015) Suicidal ideation reported by adults with Type 1 or Type 2 diabetes: Results from Diabetes MILES-Australia. Diabet Med 33: 1582-1589.

20. Van Dooren FE, Denollet J, Verhey FR, Stehouwer CD, Sep SJ, et al. (2016) Psychological and personality factors in type 2 diabetes mellitus, presenting the rationale and exploratory results from The Maastricht Study, a population-based cohort study. BMC Psychiatry 27: 16-17.

21. Prinz N, Bachle C, Becker M, Berger G, Galler A, et al. (2016) Insulin pumps in type 1 diabetes with mental disorders: Real-life clinical data indicate discrepancies to recommendations. Diabetes Technol Ther 18: 34-38.

22. Chaudhry R, Mishra P, Mishra J, Parminder S, Mishra BP (2011) Psychiatric morbidity among diabetic patients: A hospital-based study. Ind Psychiatry J 19: 47-49.

23. Bajor LA, Gunzler D, Einstadter D, Thomas C, McCormick R, et al. (2015) Associations between comorbid anxiety,diabetes control and overall medical burden in patients with serious mental illness and diabetes. Int J Psychiatry Med 49: 309-320.

24. Shin JK, Poltavskiy E, Kim TN, Hasan A, Bang H (2016) Help-seeking behaviors for serious psychological distress among individuals with diabetes mellitus: The California health interview survey, 2011-2012. Primaire Care Diabetes 11: 63-70.

25. Chien IC, Lin CH (2016) Increased risk of diabetes in patients with anxiety disorders: A population-based study. J Psychosom Res 86: 47-52.

26. Garcia ME, Lee A, Neuhaus J, Gonzalez H, To TM, et al. (2016) Diabetes Mellitus as a risk factor for development of depressive symptoms in a population-based cohort of older Mexican Americans. J Am Geriatr Soc 64: 619-624.

27. Whitworth SR, Bruce DG, Starkstein SE, Davis WA, Davis TME, et al. (2017) Depression symptoms are persistent in Type 2 diabetes: Risk factors and outcomes of 5 year depression trajectories using latent class growth analysis. Diabet Med 34: 1108-1115.

28. Solli O, Stavem K, Kristiansen I (2010) Health-related quality of life in diabetes: The associations of complications with EQ-5D scores. Health Qual Life Outcomes 8: 18.

29. Atlantis E (2012) Excess burden of type 1 and type 2 diabetes due to psychopathology. J Affect Disord 142: S36-41.

30. Gemeay EM, Moawed SA, Mansour EA, Ebrahiem NE, Moussa I, et al. (2015) The association between diabetes and depression. Saudi Med J 36: 1210-1215.

31. Dos Santos MAB, Ceretta LB, Reus GZ, Abelaira HM, Jornada LK, et al. (2014) Anxiety disorders are associated with quality of life impairment in patients with insulin-dependent type 2diabetes: A case-control study. Rev Bras Psiquiatr 36: 298-304.

32. Sun N, Lou P, Shang Y, Zhang P, Wang J, et al. (2016) Prevalence and determinants of depressive and anxiety symptoms in adults with type 2 diabetes in China: A cross-sectional study. Br Med J Open 6: e012540.

33. Ciechanowski PS, Katon WJ, Russo JE (2000) Depression and diabetes: impact of depressive symptoms on adherence, function, and costs. Arch Int Med 160: 3278-3285.

34. Lewko J, Kochanowicz J, Zarzycki W, Mariak Z, Górska M, et al. (2012) Poor hand function in diabetics. Its causes and effects on the quality of life. Saudi Med J 33: 429-435.

35. Wang MY, Tsai PS, Chou KR, Chen CM (2008) A systematic review of the efficacy of non-pharmacological treatments for depression on glycaemic control in type 2 diabetics. J Clin Nurs 17: 2524-2530.

36. Mosaku K, Kolawole B, Mume C, Ikem R (2008) Depression, anxiety and quality of life among diabetic patients: A comparative study. J Natl Med Assoc 100: 73-78.

37. BundoVidiella M, AubaLlambrich J, MassonsCirera J, Trilla Soler MC, Perez Villegas R, et al. (1996) Anxiety and depression in type II diabetics. Atencao Primaria 17: 58-62.

38. Lyoo IK, Yoon S, Jacobson AM, Hwang J, Musen G, et al. (2012) Prefrontal cortical deficits in type 1 diabetes mellitus: brain correlates of comorbid depression. Arch Gen Psychiatry 69: 1267-1276.

39. Bernstein CM, Stockwell MS, Gallagher MP, Rosenthal S, Soren K (2013) Mental health issues in adolescents and young adults with type 1 diabetes: Prevalence and impact on glycemic control. Clin Pediatr (Phila) 52: 10-15.

40. Liu X (2014) Sleep and adolescent suicidal behavior. Sleep 27: 1351-1358.

41. Blasco-Fontecilla H, Alegria AA, Lopez-Castroman J, Legido-Gil T, Saiz-Ruiz J, et al. (2011) Short self-reported sleep duration and suicidal behavior: A cross-sectional study. J Affect Disord 133: 239-246.

42. Breslau N, Roth T, Rosenthal L, Andreski P (1996) Sleep disturbance and psychiatric disorders: A longitudinal epidemiological study of young adults. Biol Psychiatry 39: 411-418.

43. Ciccone MM (2010) Feasibility and effectiveness of a disease and care management model in the primary health care system for patients with heart failure and diabetes (Project Leonardo). Vasc Health Risk Manag 6: 297-305.

44. van Dijk PR, Logtenberg SJ, Groenier KH, Keers JC, Bilo HJ, et al.(2014) Fifteen-year follow-up of quality of life in type 1 diabetes mellitus. World J Diabetes 15:569-576.