



The Prevalence of Depression among Patients with Diabetes Mellitus in the Levant and Gulf countries

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ABSTRACT

The main purpose of this paper is to shed the light on the available data on depression among patients with diabetes mellitus in the Levant and Gulf countries, as well as get better understanding on the prevalence of the co-occurrence of this double whammy and find out what other sociodemographic factors that might affect the co-occurrence. Electronic databases CINAHL, Pub Med, Google Scholar, and Medline with Full Text were searched for English language articles in peer-reviewed journals between 2005 and 2014. A total of 11 studies exploring diabetes among patients with diabetes were selected, in order to review evidence on recent research in Gulf as well as Levant countries. Nine of the reviewed articles reported high rates of co-morbidity of depression and diabetes. Moreover, diabetic women experience a higher prevalence of depression than men. Additionally, Poor glyceemic control (Hb A1c) is linked with increased depressive symptoms. Also being on insulin regimen had shown to be associated with depression among patient with diabetes. Current research suggested that the risk of developing depression is increased in people with diabetes; however, further studies in the Gulf and Levant countries are required in order to establish the nature of the relationship between depression, glyceemic control and the development of diabetes complications, then to make appropriate recommendations for treatment and to support management of diabetes.

Keywords: depression, diabetes, Gulf and Levant countries.

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INTRODUCTION

Diabetes is a serious metabolic health problem among Arab speaking countries and the prevalence is continuing to increase.¹ International Diabetes Federation (IDF) estimated that around 37 million Arab people have type 2 diabetes mellitus, and this is projected to reach 68 in 2035.² Unpleasantly, the top six world leading countries; among Arabic speaking, countries were Kuwait, Lebanon, Qatar, Saudi Arabia, Bahrain, and United Arab Emirates (UAE).³

Diabetes has been presented to be one of the most psychologically and behaviorally demanding medical illnesses. People with chronic medical condition such as diabetes suffer from psychological and social disturbances.⁴ Unlikely, Depression is the most common psychiatric disorder witnessed by the diabetes community,^{5,6} the relationship between both were highly documented.^{7,8,9} Furthermore, the prevalence of having the double whammy has increased dramatically.¹⁰

The prevalence of clinical depression was 12 % for people with type I DM,¹¹ and up to 18% in people with type 2 DM.¹² Other epidemiological evidence suggested that at least one third of people who have diabetes suffer from clinically relevant depressive disorders.⁶ The prevalence rate is varied in many researches findings, which could be due to using different scales in assessing depression.¹³

There is growing evidence regarding this relationship. In a systematic review, Renn, Feliciano, and Segal mentioned that relationships between both conditions are bidirectional; depression as a consequence of diabetes and depression as a risk factor for diabetes.¹⁴ Some of the factors that attributed the co-occurrence were genetic susceptibility, pathophysiological abnormalities, psychological and psychosocial impact of the disease.^{14,15}

The Problem is not stopped for having diabetes and depression together only, complications extended to have poor disease control, decreased self-care behaviors, increased missed appointments, adverse health outcomes, and impairment in quality of life.^{16,17} The final results are high cost and a heavy burden among those individuals with diabetes aside from depression.¹⁷ Holt & Feltz-Cornelis found that the management of diabetes in developed countries costs at least 10 % of the total health budget for diabetes management and its complication.¹⁸

In conclusion, depression and diabetes are chronic non comorbid illnesses that cause disability for large amount of the population.¹⁹

For those reasons, both conditions should be optimally detected and treated to maximize patient outcomes, which may improve health outcomes in DM population.²⁰ Strategies like collaborative

model approaches can be used on this vulnerable population. But, further research is needed to evaluate its effectiveness.¹⁷

Purpose of this literature review

Though the prevalence rate of depression and diabetes is going up in Arab countries, there were limited researches in Levant and Gulf countries to identify even the relationship between both conditions. Therefore, the aim of this review is to bring to light the currently available evidence about:

The prevalence of the co-occurrence of both conditions, namely depression and diabetes in the Levant and Gulf countries . To find out what other sociodemographic factors that might affect the co-occurrence of this double whammy.

MATERIALS AND METHOD

Eleven studies were chosen to describe the concept of diabetes and depression . In order to review evidence on recent research and innovations in care, literature searches of full text articles in the last 10 years were conducted. Articles were identified using CINAHL, Pub Med, Google Scholar, and Medline with Full Text. Search terms included menopause, perimenopause, “menopause symptoms” ,midlife and quality of life. In addition, several other websites were searched based on findings from the research papers or from the Google Scholar articles during the period between 2005 and 2014. Only English language articles in peer-reviewed journals were chosen for the review. Search terms included following terms: “diabetes,” “relationship,” “depression.” and “depression and diabetes” The Inclusion criteria were; primary data with full text. Studies including patient diagnosed with type 1 or 2 DM, and used HbA1C to confirm that patient had DM, participants older than 18. Unpublished manuscripts or doctoral dissertations and review or opinion articles had been excluded. Methodological pathway is presented in Figure 1.

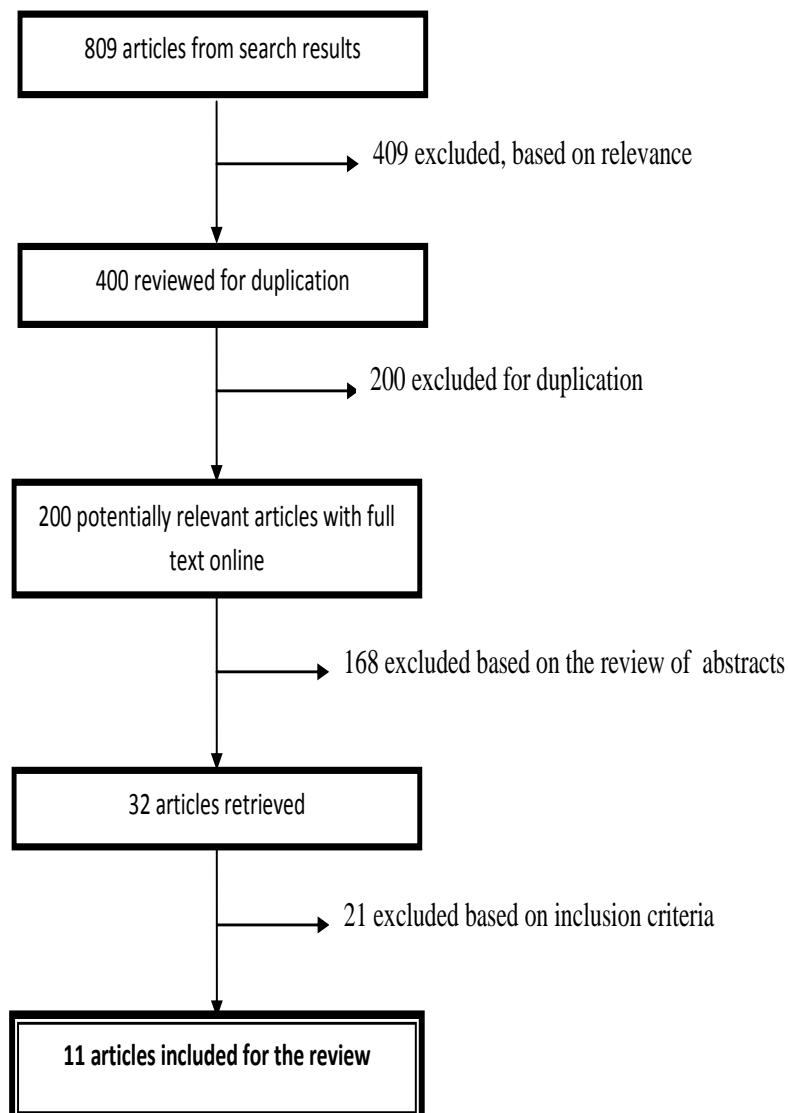


Figure 1: Methodological flow chart:

RESULT AND DISCUSSION

A total of 11 quantitative studies published between 2005-2014 were identified from the literature search, all were done using cross sectional design, these studies were conducted in 7 Arab countries namely Jordan-2^{21,22} (Mansour, Al Badawi, Haourani, & Marmash, 2013; Al-Amer, Sobeh, Zayed, & Al-domi, 2011); Oman-1²³ (Al-Maskari Al-Shukaili, & Al-Mammari, 2010); Iraq-1²⁴ (Mansour, & Jabir 2007), Palestine-1¹³ (Sweileh, et al. 2014), UAE-2^{25,26} (Hawamdeh, Almakhzoomy, Hayajneh 2013; Sulaiman, Hamdan, Tamim, Mahmood, & Young, 2010), KSA-3^{27,28,29} (AL-Baik, Moharram, Elsaid, Al-Baik, Al-Dahan, Alkhadhrawi, Al-Omran, & Dahneam, 2014; Al-Hayek, Robert, Alzaid, Nusair, Zbaidi, Al-Eithan, & Sam, 2012; El Mahalli, 2015); and

Bahrain -1³⁰ (Almawi, Tamim , Al-Sayed, Arekat, Al-Khateeb, Baqer, Tutanji, & Kamel, 2008).

The details are presented in Table 1.

	Title	Author	Year	Sample	Country	Tool	Result
1.	Screening and Correlates of Depression and HbA1C in United Arab Emirates (UAE) Women With Diabetes	Hawamdeh, et al	2013	182 female	UAE	Beak Depression Inventory II	<ul style="list-style-type: none"> - significant relationship was found between depression level and diabetes status. - A positive relationship between poor glycemetic control and higher levels of depression was identified.
2.	The prevalence and correlates of depression and anxiety in a sample of diabetic patients in Sharjah, United Arab Emirates	Sulaiman, et al.	2010	347 female	UAE	K6 scale	<ul style="list-style-type: none"> - Patients who are depressed tended to have poorer self-care, more severe physical symptoms and were less likely to adhere to prescribed care regimens
3.	Prevalence of depression among people with type 2 diabetes mellitus: a cross sectional study in Palestine	Sweileh, et al.	2014	294	Palestine	Beck Depression Inventory (BDI-II) scale	<ul style="list-style-type: none"> - 40% of the screened patients were potential cases of depression, - Significant predictors of depression were low education, having no current job, having multiple additional illnesses, and having low medication adherence.
4.	Depression among adults with diabetes in Jordan: risk factors and relationship to blood sugar control	Al-Amer, et al.	2011	649	Jordan	Patients' Health Questionnaire-8 (PHQ-8).	<ul style="list-style-type: none"> - 19.7% have depression - Females are more likely to develop depression than males
5.	Screening for depression in diabetic patients	Baik, et al.	2014	203	KSA	Arabic version of PHQ-2	<ul style="list-style-type: none"> - All diabetic patients are at risk of having depression, female gender, long standing

							diabetes, insulin use and having medical comorbidities are at higher risk.
6.	Association between diabetes self-care, medication adherence, anxiety, depression, and glycemic control in type 2 diabetes.	Hayek, et al.	2012	147	KSA	Hospital anxiety and depression scale (HADS)	- The results of this study indicate that poor diabetes self-care management behavior, low adherence to medicine, higher level of anxiety, and depression are associated with poor glycemic control.
7.	The prevalence of co morbid depression among adults with diabetes in southern Iraq	Mansour and Jabir	2007	103	Iraq	Center for Epidemiologic Studies Depression Scale (CES-D)	- Diabetic were having higher score for depression than the control, but both group scored >16, which mean that all of our population were depressed
8.	Depression, psychological distress and coping skills among patients diagnosed with type-II Diabetes Mellitus	Mansour, et al	2013	307	Jordan	Beck Depression Inventory-II (BDI-II)	- 22.0% of the patients reported that they had moderate to severe depressive symptoms, - More than 50% had moderate level of psychological distress. - Significant difference between male and female patients in their depressive symptoms
9.	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	Almawil, et al.	2008	143	Bahrain	Depression Anxiety Stress Scales (DASS)	- Higher proportion have mild-moderate and severe- extremely severe depression , anxiety, and stress groups. - Chronic disease and disease duration were significantly associated with the 3 disturbances, Anxiety, depression, and stress were associated with DM after adjusting for all

							variables.
10.	Pro-Inflammatory Cytokines in Omani Type 2 Diabetic Patients Presenting Anxiety and Depression	Maskari, et al	2010	30	Oman	Hospital Anxiety and Depression Scale (HADS)	- High prevalence of anxiety and depression along with high levels of inflammatory markers were detected.
11.	Prevalence and Predictors of Depression among Type 2 Diabetes Mellitus Outpatients in Eastern Province, Saudi Arabia	El Mahalli	2015	260	KSA	The Center for Epidemiologic Studies Depression Scale (CES-S)	- Almost fifty percent of diabetics were depressed - Patients with poor diabetes mellitus control and unmarried were more risky for developing depression and difference was significant.

Most of the studies used HbA1c (level 7 is the cutoff point) to confirm Diabetes among participants. In regard to depression assessment; 4 studies used Beck Depression Inventory (BDI), patients with score 16 or higher were considered depressed, 2 studies used Patients' Health Questionnaire (PHQ) and the score of 10 or more was considered to be significant. Depression Anxiety Stress Scales (DASS) also was used in one study and score 10 or more is considered. One more study used (K6) score 19 or above was considered significant. And two studies used Hospital Anxiety and Depression Scale (HADS) and score 8 or more was considered to be significant. Finally, The Center for Epidemiologic Studies Depression Scale (CES-S) with cutoff point of 15 and above indicated clinical significance.

Regarding the prevalence of co-occurrence of Diabetes and Depression, the majority of the study findings agreed that the prevalence of depression was found to be higher among participants with diabetes than participants without Diabetes.^{13,21,22,24,25,27,30} While Al Maskari and colleagues failed to find a significant correlation between hyperglycemia and depression.²³

The causes of the association between depression and hyperglycemia in individuals with diabetes cannot be determined from that cross-sectional study. Furthermore, Hawamdeh and colleagues found a high significant relationship between types of depression and having type 1 DM more than having type 2 DM.²⁵

There was an association between glycaemia and depression among participants without diabetes particularly for HbA_{1c}. Many studies found that worsening glycemic control (Hb A1c) is

linked with increased depressive symptoms.^{22,26,27,28,29} One of these studies found high significant relationship (p value <.001) with poor glycemic control and the level of depression (Hawamdeh, Almakhzoomy, & Hayajneh, 2013). In contrast, Sweileh and coauthor found no significant association between depression score and glycemic control, and duration of diabetes.¹³

Regarding the relationship between demographic and personal variables, Several factors seem to be correlated with depression in types 1 and 2 diabetes. Mansour and colleagues found a negative correlation between age and depressive symptom, but it wasn't statistically significant.²¹ This goes hand in hand with a study conducted in Bahrain, the result found no significant correlation with regard to age.³⁰

Regarding gender differences, there are Consensus and agreement over those cross-sectional studies that depression was associated with female gender ; women were more likely than men to get depression with DM.^{13,22,24,27,30} Marital status was shown to be significant; El Mahalli noticed that unmarried diabetic patients were three times more depressed than married ones and the difference was statistically significant.²⁹ While the results of the studies conducted by AL-Baik as well as Sulaiman revealed the opposite.^{26,27} Other factors were not significantly associated with increased risk for depression such as being smoker.²⁶

Other findings among UAE women, revealed that women who received university education and had higher income had poor glycemic control.²⁵ This is matched with the result of 103 male and female patients from Iraq.²⁴ In contrast, having lower education had been a significant factor associated with depression among adult diabetes patients in Jordan,²² as well as having a low income is considered as a predictor.³⁰ Moreover, patients who were unemployed have significant higher depression score than a full time employee.²¹ On the contrary, AL-Baik and colleagues found that being unemployed, uneducated, with low income were not associated with increased risk for depression in KSA.²⁷

Other factor such as type of diabetes is correlated. Hawamdeh and co-authors found those who significantly reported severe to extreme depression had type 1 DM.²⁵ Also being on insulin regimen had shown to be associated with depression among patient with diabetes,^{22,25,27} as well as having other medical comorbidities.^{13,22,27} Additionally, others revealed that BMI was shown to be associated with depression,²⁹ but AL-Baik, et al. and Sulaiman mentioned these relationship as not significant.^{26,27} Moreover, those patients had poor self-care management behavior, lower medication adherence than those not depressed.^{13,22,28}

Furthermore, long standing diabetes will be contributing factors and significantly associated with depression among diabetic community.^{22,27} Those opposed the results of the Saudi study where

patients who had DM for more than 20 years were not at higher risk to get depression.²⁹ The strange result in KSA study, even if it's not significant, reflect that all non- Saudi diabetics were depressed .²⁹ This finding was consistent with a study conducted in Emirate where non-Emiratis were more depressed.²⁶

This review considered the latest evidence on diabetes and depression in term of prevalence, association with glycemic control, and risk factors among diabetic patients of Arab middle east countries. The evidence of reviewed studies suggested that depression prevalence is higher among people with diabetes. As well as diabetic patients have more risk to get depression. The results of this study correspond to large-scale population-based assessment, in which They found that depression is highly prevalent among people with diabetes across countries which are different in language, culture and level of socioeconomic development.³¹ Likewise, Brown and colleagues found that similar incidence of new-onset depression between diabetics and non-diabetics.³² However, other mentioned that “no association between glycemic control and depression among participants without diabetes” and also “If depression is indeed a risk factor for development of diabetes, we might have expected to see higher glucose levels associated with more depression symptoms in the participants without diabetes”.³³

There was agreement that poor glycemic control and severity of depression seems to be correlated to each other. The result is corresponding with one conducted in western country in which they noticed that HbA_{1c} was significantly higher in patients with diabetes who were depressed than who were not.³³ Furthermore, the severity of depression is positively correlated with HbA_{1c} .³⁴ While no difference in HbA_{1c} level in diabetic patients with and without depression.³⁵ In patients who had diabetes and depression, researchers reported that psychotherapy and antidepressant medications had a positive effect on both mood and glycemic control. Additional research will help us better understand the links between behavior and psychological mechanisms by which improvement in depression reflect better adherence to diabetes treatment and healthiest living.³⁶

Sweileh and coworkers 2014 found that diabetic patients with depression had a Less medication adherence than who were not depressed.¹³ Lin and colleagues supported this idea, that depressed patient couldn't adhere to their diabetic regimen, and state that depressed patients used around 20 less days of hypoglycemic agents than non-depressed patients.³¹ Moreover, lack of physical activity, high rates of non-adherence to medicine, and inadequate clinical monitoring of Diabetes were identified as three barriers that interfere with effective diabetes management to achieve favorable diabetes outcomes among depressed patients.³⁷

This review has shed light on potential demographic variables. The Studies reviewed suggested that women with diabetes found to have higher rates of depression. That corresponds with a meta-analysis of 42 eligible studies' result done by Anderson and coworker in 2001, which found that the prevalence of comorbid depression among women was significantly higher than men.⁶ A remarkable feature of depression in the general population is that women are more likely to experience depression compared with men.³⁸ Approximately 25% of women and 16% of men will have depressive episode during their lifetime.³⁹ University of Maryland Medical Center summarized that depression is associated with the combination of genetic, psychological, environmental, and biological factors.⁴⁰ Moreover, other factors such as being a female, poverty, severe or chronic medical conditions, insomnia, exposed to violence or abuse are also associated with depression. Diabetes self – management programs for women as well as men that focus on behavior modification can help these diabetic patients improve their metabolic control, sense of wellbeing and quality of life. New researches showed that treatment supervised by a nurse case management could improve both depression and diabetes.⁴¹

However, AL-Baik showed that long standing DM in KSA might be led to depression,²⁷ which correspond with other study conducted in the same region, who found that depression is higher among diabetics with long duration of DM, and with poor glycemic control.⁴² Other factors like being on insulin therapy were also found to be associated with the risk of having depression. This risk factor is also documented by other studies such as Pouwer and co-workers in 2003.⁴³

In terms of income, there is no settled answer, whether if economic status and level of education affect positively or negatively on depression among diabetic patients. This finding is not unexpected. As mentioned in a literature review done by Leone and colleagues, they report a limited number of studies discussed the occurrence of depression and the co-occurrence of depression in people with diabetes and its relation with socio-economic status.⁴⁴

Furthermore, two studies found that smoking didn't affect the level of depression among diabetic patients.^{24,26} While other evidence from previous work showed that people with diabetes who smoke have higher depression score than others who were not smoking.^{45,46}

There were many barriers to diagnose and treat Depression. In a Jordanian study, authors found that “Lack of education about Depression, lack of availability of appropriate therapies, competing clinical demands, social issues, and the lack of patient acceptance of the diagnosis were felt to be among the most important barriers to the identification, diagnosis, and treatment of patients with depression in this population”.⁴⁷ The demand on improve patients' self-efficacy and self-care behavior are required.⁴⁸ Different interventions that tailoring patients needs and preferences should

be implemented.⁴⁹ Different treatment approaches that maximally improve both depression and glycemic control should be created, with the focus shifting away from separate management of the two conditions and two solutions.⁵⁰

Recommendations and Nursing implication

The review of literature on Arab middle east countries herein presents the higher comorbidity rate of depression and diabetes. More cross sectional and longitudinal researches are needed in this field to identify factors and barriers, as well as there is a need for randomized controlled studies to inform the development of effective treatments for depression in diabetic patients. Also We highly recommend opening channel between patients and health care providers for better understanding to the experiences from a patient perspective, in order to build supportive and culturally sensitive interventions for the management of the illness. Additionally, introducing a psychological aspect is the need of the hour, subsequently considering the other support system to manage diabetes and depression together can offer the diabetic patients of the middle eastern countries, a better quality of life. Treatment of Depression in the context of diabetes should be managed by a mental health professional, who is in close communication with the physician providing the diabetes case.

Managing diabetes can be stressful and lead to symptoms of depression. diabetes can cause complications and health problems that may worsen symptoms of depression. Also, depression affects the ability to perform tasks, communication, which can interfere with the ability to manage diabetes successfully.

CONCLUSION

From our literature review, the analysis specifically demonstrates an increased prevalence of depressive disorders among Arab middle east diabetic patients. Finding regarding the association between depressive disorders and hyperglycemia has been consistent with previous literature. Moreover, the relationship between depression and diabetes may be complicated by sociodemographic factors, such as gender, duration of diabetes, socioeconomic status, insulin therapy, and smoking. However, this review revealed that there is a scarcity of data regarding depression and diabetes in Arab countries.

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