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RECOGNITION OF DEPRESSION IN PATIENTS WITH DIABETES
A LITERATURE REVIEW

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Abstract

A literature review was conducted to explore the recognition of depression in patients with diabetes. Articles were obtained from PubMed, PsycINFO, and CINAHL databases. The results of these studies were compared to answer the following questions: 1) what is the current level of recognition of depression by physicians and nurses in patients with type 1 and/or type 2 diabetes? 2) What screening methods for depression are being used for patients with diabetes and how reliable are they? 3) What are the barriers to recognition? 4) In particular, what patient characteristics lead to the under-recognition of depression in this population? 5) Also, what situational variables lead to the under-recognition of depression in this population? Recognition rates were relatively low (between 20% and 86%). Nine screening tools were analyzed in studies, with the BDI and PHQ being the most widely used. Women are less likely to be assessed for depression than men but have higher rates of depression than men. More depressed women were likely to be young, unmarried, cigarette smokers, and less likely to be physically active and alcohol drinkers. Brief visits between the patient and primary care provider limit the extent of information ascertained per session. If the patient does not actively divulge information related to depression, the topic is often not discussed. Also, there are usually several medical explanations for the clinical manifestations of depression. Physicians feel that diabetes is a complicated disease that is more challenging to treat than other illnesses.

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Introduction

Affecting 12.9% of the United States population, diabetes is a serious condition characterized by hyperglycemia secondary to defects in insulin production and/or insulin action. Accounting for the vast majority of cases is type 2 diabetes, which usually begins with the body's cells not using insulin properly. Type 1 diabetes, when the body's immune system destroys pancreatic beta cells leading to an inability to produce insulin, only accounts for about 5% of diagnosed cases of diabetes (Wild, Roglic, Green, Sicree, & King, 2004; Cowie, Rust, Ford, Eberhardt, Byrd-Holt, Li, & Williams, 2009). The estimated cost of diabetes is approximately $174 billion per year, with medical costs being more than two times higher for Americans with diabetes than the average American without diabetes (American Diabetes Association, 2008).

The risk of death in patients with diabetes is about twice as high as those without diabetes (Egede & Ellis, 2010). Attributing to this fact are the major long term complications of the disease. The risk for heart disease and stroke is up to four times higher for patients with diabetes. In 2005-2008, more than a quarter of patients aged 40 years or older with diabetes had diabetic retinopathy, and almost 5% of those cases were advanced enough to lead to severe vision loss. In addition, diabetes accounts for more than 60% of nontraumatic lower-limb amputations related to nervous system damage (Kuller, 1995; Zhang, Saaddine, Chou, Cotch, Cheng, Geiss, Geiss et al, 2010; Gregg, Sorlie, Paulose-Ram, Gu, Eberhardt, Wolz, et al, 2004).

Already an economic and medical burden, when coupled with the presence of comorbid depression, diabetes becomes an unstoppable force of destruction in the lives of these patients. Recent studies have found that a diagnosis of diabetes doubles a patient's

odds of developing depression (Anderson, Freedland, Clouse, & Lustman, 2001). In 2010, research emerged listing depression as the number one factor having a negative effect on health-related quality of life in patients with diabetes. The results of this study by Verma et al suggest that the combination of depression and diabetes has more severe consequences than the addition of the two conditions separately (Verma, Luo, Subramaniam, Sum, Stahl, Liow, & Chong, 2010). Hu et al, associated with the University of North Carolina, found that diabetes symptom distress was positively correlated with depression, meaning that the severity of symptoms such as nausea, pain, fatigue, outlook, and appetite increased as depression symptoms increased. The study also revealed that the more severe the depression was in an individual, the less that individual functioned (Hu, Amoako, Gruber, & Rossen, 2007).

A recent meta-analysis of 27 studies concluded that there is a significant relationship between depression and a variety of diabetes complications. The effect sizes did not differ across an assorted mix of complications, from macrovascular to microvascular. Although type 1 and type 2 diabetes have different physiological causes, manifestations, and treatments, these subtypes showed similar results regarding the association between depression and diabetes complications. An increase in depressive symptoms related to more severe complications or a greater number of complications among all of the aggregates (De Groot, Anderson, Freedland, Clouse, & Lustman, 2001).
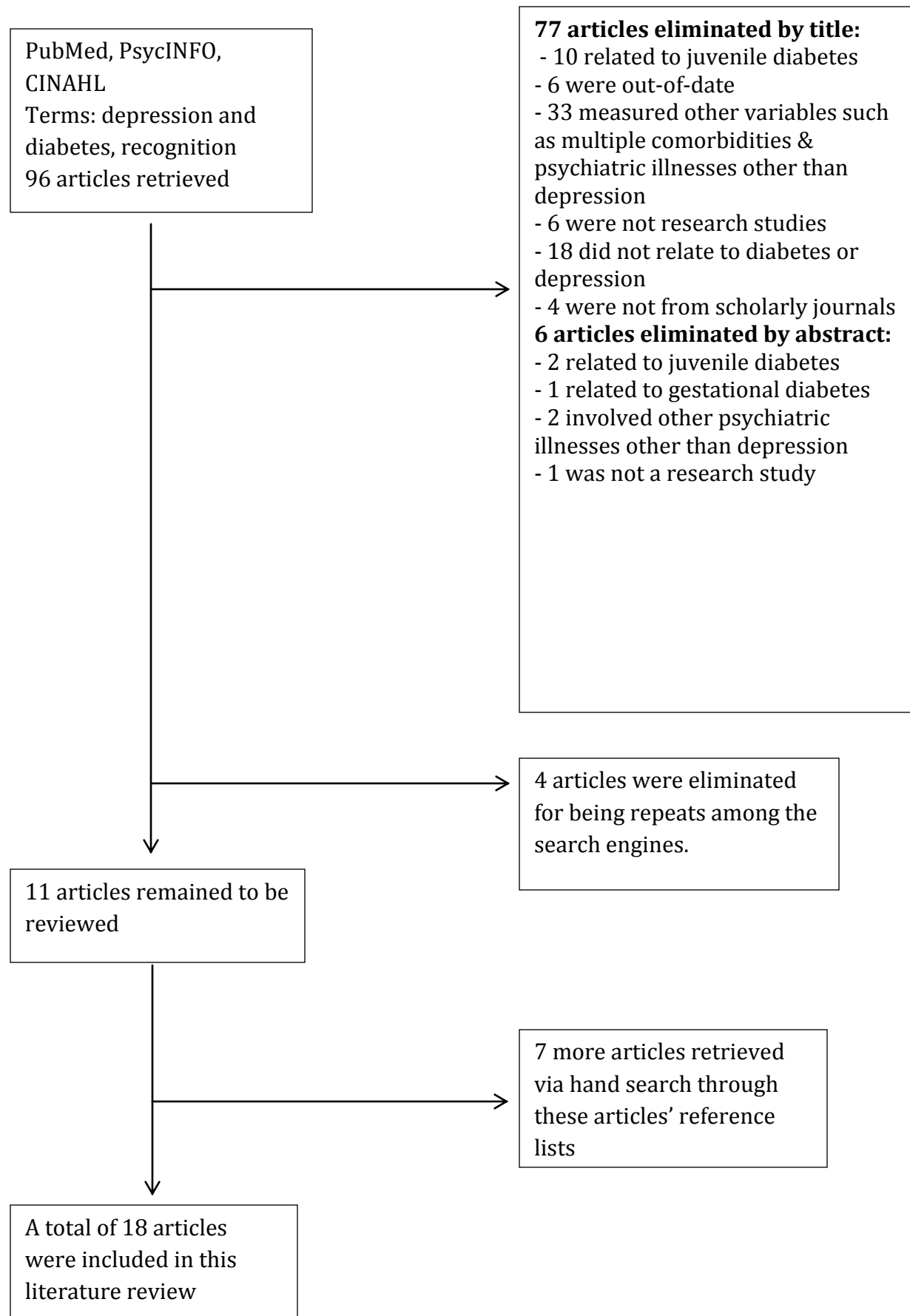
Increasing depression severity has been shown to be associated with an increase in health care costs as well. These costs are mostly medical, related to complications and symptoms of diabetes exacerbated by depression, rather than related to the mental health issue itself (Ciechanowski, Katon, & Russo, 2000). Using the Harvard Department of

Psychiatry/National Depression Screening Day Scale (HANDS) to assess symptoms of depression, researchers in Massachusetts found that increasing HANDS scores were associated with poorer adherence to general dietary and fitness recommendations. In the same study, the presence of major depression also showed a two fold increase in the odds of the patients missing one or more prescribed medications. Even patients with depressive symptoms that did not meet criteria for major depression exhibited poorer self-care behaviors (Gonzalez, Safren, Cagliero, Wexler, Delahanty, Wittenberg, & Blais, 2007). As many as one in three individuals with diabetes was found to have a level of depression that impairs functioning, quality of life, adherence to medical treatments, and glycemic control (Anderson et al, 2001).

While depression is well-documented as having a profoundly negative effect on the health and wellbeing of patients suffering from diabetes, it is still under-recognized by health care professionals. The purpose of this literature review is to evaluate the recognition of depression in patients with diabetes, including causes and risk factors of under-recognition, barriers to recognition, and implications for nursing practice. The following questions will be addressed: 1) what is the current level of recognition of depression by physicians and nurses in patients with type 1 and/or type 2 diabetes? 2) What screening methods for depression are being used for patients with diabetes and how reliable are they? 3) What are the barriers to recognition? 4) In particular, what patient characteristics lead to the under-recognition of depression in this population? 5) Also, what situational variables lead to the under-recognition of depression in this population?

Methods

Literature searches were conducted using the PubMed, PsycINFO, and CINAHL databases for all articles using the keywords "diabetes" and "depression," and "recognition." Articles meeting the following criteria were included in the searches: 1) studies published in English language journals between 1980 and 2010, 2) only adult subjects (eighteen years and older), 3) patients with a medical diagnosis of diabetes, 4) evaluation of depressive symptoms. Exclusion criteria included studies focusing primarily on gestational diabetes and juvenile diabetes. Preliminary searches yielded a total of 96 articles: 77 articles were eliminated by title for not pertaining to the purpose or not meeting criteria, 6 articles were eliminated by abstract for not pertaining to the purpose or not meeting criteria, and 4 more articles were eliminated for being repeats. A hand search through the references of the remaining articles yielded 7 more articles. A detailed description of the research process is outlined in Figure 1.

PubMed, PsycINFO,
CINAHL
Terms: depression and
diabetes, recognition
96 articles retrieved

77 articles eliminated by title:
 - 10 related to juvenile diabetes
- 6 were out-of-date
- 33 measured other variables such
as multiple comorbidities &
psychiatric illnesses other than
depression
- 6 were not research studies
- 18 did not relate to diabetes or
depression
- 4 were not from scholarly journals
6 articles eliminated by abstract:
- 2 related to juvenile diabetes
- 1 related to gestational diabetes
- 2 involved other psychiatric
illnesses other than depression
- 1 was not a research study

4 articles were eliminated
for being repeats among the
search engines.

11 articles remained to be
reviewed

7 more articles retrieved
via hand search through
these articles' reference
lists

A total of 18 articles
were included in this
literature review

Results

A total of 18 articles met the criteria to be reviewed. The characteristics and findings of these studies are outlined in Table 1 in the Appendix. The definitions of depression, diabetes, and recognition varied by study. Three of the studies performed analysis using solely secondary analysis from hospital records and data from previous studies. Primary interviews or surveys were conducted in 10 studies. The remaining 5 studies were literature reviews and meta-analysis reviews.

Rates of Recognition

The articles reviewed showed rates of recognition of depression in patients with diabetes ranging from 20-86%. Lustman and Harper (1987) reviewed the lifetime psychiatric histories of 56 subjects with diabetes, 28 of whom reported symptoms of a major depressive episode in the twelve months prior to a psychiatric evaluation. The National Institute of Mental Health Diagnostic Interview Schedule - Version Three (DSM III) determined the psychiatric diagnoses. Of the depressives, 64.3% were either incompletely diagnosed or received no psychiatric diagnosis. The authors also included data from seven other studies measuring recognition of depression in patients with diabetes in which the rates of under-recognition ranged from 35-86% (Lustman and Harper, 1987).

A study that surveyed 869 patients with diabetes found that 19% met the HANDS criteria for major depression, and two thirds of the patients had some depressive symptoms. Of those with probable major depression, over 40% did not have depression documented in their medical records (Gonzalez, 2007).

Another study that sought to determine the rate of accurate diagnosis of depression surveyed patients on the Group Health Cooperative diabetes registry. They used the Patient Health Questionnaire (PHQ-9) to screen for depression. The criteria for major depression included having 5 or more depressive symptoms for at least half of the days in a 2-week period, with the presence of depressed mood and/or anhedonia. Of the 4385 patients surveyed, 524 screened positive for major depression. About 51% of the 524 patients had a documented diagnosis of depression in the 12 months before screening (Katon, Simon, Russo, Von Korff, Lin, Ludman, & Ciechanowski, 2004).

These low rates of recognition are consistent across aggregate groups. Jones and Doebbeling compared depression screening disparities between veterans with diabetes and veterans without diabetes. The facility they studied uses the Patient Health Questionnaire-9 to diagnose depression. They monitored depression screening over a four year period at a Midwestern Veterans Health Administration (VHA) facility using electronic medical records and facility-level data from inpatient and outpatient encounters. Although the rates of screening increased in those years, veterans with diabetes were 15% less frequently screened for depression during those four years than the general veteran population. This finding is consistent with national trends among veterans; however, twice as many veterans screened positive for depression at this facility than the national average in the veteran population (Jones & Doebbeling, 2007).

Screening Tools

Lustman and Clouse (2005) summarized the depression screening tools used most often for patients with diabetes. They evaluated 9 tools, 5 of which are self-administered, including the Beck Depression Inventory (BDI), PHQ-9, the Depressive Cognition Scale, Zung's Screen for Depression, and the Centers for Epidemiologic Studies Depression (CES-D) questionnaire. The BDI is a 21-item survey that measures the presence and severity of cognitive and somatic symptoms of depression. It is specific for depression and has been validated in diabetes. This tool is reliable and has been used for more than 40 years. The PHQ-9 is also specific to measuring the severity of depressive symptoms, but it has not been validated in diabetes. The BDI and PHQ-9 are regarded highest by Lustman and Clouse (2005).

Lustman and Clouse reported that the Depression Cognition Scale assesses eight depressive cognitions, including worthlessness, powerlessness, hopelessness, helplessness, purposelessness, loneliness, emptiness, and meaninglessness. This tool is specific to depression and has demonstrated validity in diabetes. Zung's Screen for Depression is used to screen for Major Depressive Disorder and depressive mood, and it is useful in detecting the early signs of depression. It has been validated in diabetes as well. The CES-D is a 20-item questionnaire that primarily measures depressive affect and has been validated in diabetes (Lustman & Clouse, 2005).

The rest of the tools Lustman and Clouse evaluated are conducted via interview. The Hamilton Rating Scale for Depression is specific to depression but not validated in diabetes. The Diagnostic Interview Schedule is a highly structured and reliable tool, but is not specific to diabetes. The Structured Clinical Interview - DSM IV is the gold standard for

making an Axis I diagnosis of major depression. It is depression-specific and validated in diabetes. The Composite International Diagnostic Interview (CIDI) is specific to depression and validated in diabetes. There is also a short form of the CIDI available (Lustman & Clouse, 2005).

In a recent literature review, Molife discussed many of these same screening tools. He determined that the BDI, CES-D, PHQ-9, and Zung's Depression Scale have all shown adequate sensitivity and specificity in the recognition of depression in patients with diabetes. He also reported that limited knowledge regarding diagnostic tools or concerns over their reliability and validity contribute to the underuse of these tools by health care providers with diabetic patients (2010). A meta-analysis performed in 2001 found that self-administered tools yielded two to three times higher depression rates than other methods (Anderson, 2001). Discrepancies between tools is another contributing factor to their limited use.

Of the articles analyzed in this review, three studies used variations of the Patient Health Questionnaire to define depression in the subjects, one study used the Diagnostic Interview Schedule, and four studies used screening methods not outlined by Molife or Lustman and Clouse. In addition to the recommendations of these researchers, two more studies recommended the use of the Patient Health Questionnaire, while one other study recommended the use of the BDI, and one study recommended the use of CES-D. Anderson, Freedland, Clouse, and Lustman found that self-report questionnaires produced a higher prevalence of comorbid depression in patients with diabetes than standardized diagnostic interviews, suggesting, again, that tools such as PHQ-9 and BDI are most effective at detecting depression in this population (2001).

Barriers to Recognition

Persistent recognition of depression in patients with diabetes has been associated with decreased fatality (Richardson, Egede, & Mueller, 2008). Why, then, is recognition still inadequate? The answer is complex and multifactorial. Seven of the reviewed studies determined that the characteristics of the population have a profound impact on rates of recognition. For instance, gender is one of the leading variables involved in depression screening. In Lustman and Harper's study, significantly more females than males met criteria as depressives according to the DSM III (1987). Some studies suggest that gender differences in screening for depression can help explain this phenomenon.

The analysis from Jones and Doebbeling's data on the veteran population showed that women were 55% less likely to be assessed for depression than men, even though women have higher rates of depression than men. Of the women that were screened, 30.9% screened positive, compared to 17.3% in men (2007). On the contrary, Hu et al's study found that men were more likely to report depressive symptoms than women; however, it was pointed out that there were several other factors that could account for these results, including the living situation, age, and socioeconomic status of their sample (2007).

Another observation to note is that women with an increased severity of depressive symptoms have similar characteristics. According to a study on depression and diabetes in women, more depressed women were likely to be young, unmarried, cigarette smokers, and less likely to be physically active and alcohol drinkers (Pan, Lucas, Sun, van Dam, Franco, & Manson, 2010). Other studies have found similar results. Katon et al (2004)

concluded that patients with recognized depression were more often female, young, and unmarried. Some studies, however, have found no significant difference between depressed individuals and nondepressed individuals in regards to age and marital status (Lustman & Harper, 1987). These data suggest that physicians and nurses may screen certain populations for depression more often than others, including single, young women.

Other studies have determined that age is a significant factor to consider in the care of patients with diabetes. There is a significant inverse relationship between age and depression severity. That is, as age decreases, depression severity increases (Ciechanowski et al 2000). Older adults often exhibit depressive symptoms that may not be severe enough to meet criteria for major depression, but still pose a threat to their mental health, self-care, and quality of life. This population is often under-recognized as being depressed. It is for this reason that Hu et al (2007) recommend frequent assessment of older adults with even mild symptom distress and moderate functioning.

Although functioning levels in the Hu et al (2007) study proved to be negligible in predicting depression, levels of function have been significantly associated with depression in other studies. This study also had more severe depressive symptoms reported by white participants than by black participants, a finding that they report as being consistent with other studies (Hu et al, 2007). The increased health burden of depression on white patients with diabetes also seems to contribute to an increased risk of death among this patient group compared to other ethnicities. Although explanatory factors are unknown, demographic and socioeconomic variables do not alter this finding (Richardson et al, 2008). It is unclear whether these populations actually experience different levels of

depression or if white individuals are more likely to discuss these symptoms. Proper screening and diagnosis of all races and ethnicities may be lacking.

One study discussed a previously unexplored patient characteristic that may affect recognition of depression in patients with diabetes. The study explored the effect of relationship style on patients with comorbid depression and diabetes in a randomized trial of depression treatment. The four-item Relationship Questionnaire (RQ), which assesses attachment styles continuously and categorically, was used to determine relationship style. To further validate these styles, social support was assessed using the Interpersonal Support Evaluation List (ISEL), and the Childhood Trauma Questionnaire was used to measure childhood maltreatment. The PHQ-9 was used to screen for depression, and the Hopkins Symptom Checklist (HSCL) to assess depression change over time. The Health Care Climate Questionnaire was used to measure patient satisfaction with depression treatment (Ciechanowski, Russo, Katon, Von Korff, Simon, Lin, & Ludman, 2006).

The patients were randomly assigned to an intervention group or a control group. The intervention focused on improved health outcomes related specifically to depression. The patients in this group met with nurses trained in various treatment methods, and had the choice of receiving antidepressant treatment or problem-solving treatment (PST). The control group met primarily with a physician and received usual care as per facility protocol (Ciechanowski et al, 2006).

Patients in the independent relationship style group reported less collaboration with their diabetes-related health care teams. They experience less shared decision-making than those in the interactive relationship style. The independent relationship style patients also had more PST sessions than interactive relationship style patients. The independent

relationship style patients in the intervention group experienced more depression-free days than those in the control group. These findings suggest that the patient's relationship style significantly affects certain treatment outcomes. There were, however, no significant associations between the treatment groups and relationship styles in mental health visits, antidepressant prescription rates, and medication adherence (Ciechanowski et al, 2006).

The degree of depression is another factor that affects recognition. Katon et al (2004) determined that patients with recognized depression showed an increased intensity of depression symptoms and effects, including a greater number of panic attacks and dysthymias, more visits to primary care providers, increased loneliness, and worse health than individuals with unrecognized depression. These characteristics are often relatively easy to detect compared to other less overt signs of depression, and thus are more readily recognized by health care providers (Katon et al).

Six of the reviewed studies discussed health care system factors related to the under-recognition of depression in patients with diabetes. As mentioned, Anderson, Freedland, Clouse, and Lustman found that self-report questionnaires yield higher rates of depression than standardized diagnostic interviews. This finding suggests that the method of screening for depression used by the health care provider can affect the results, skewing the recognition rates (2001).

Molife (2010) also discussed several situational barriers to depression recognition in his literature review. Brief visits between the patient and primary care provider limit the extent of information ascertained per session. If the patient does not actively divulge information related to depression, the topic is often not discussed (Molife). Another study found that the average visit between physician and patient lasts 13 minutes, but a proper

diagnosis of depression following protocol takes about 8 minutes. The time spent with the physician is utilized to treat primary diagnoses, and there is generally no time left over to recognize secondary conditions (Williams et al, 1999).

The availability of specialized psychological health care in these sessions is also limited, further distancing depressive symptoms from the scope of care. As mentioned earlier, care providers are uncertain as to what diagnostic tools are available for depression and how reliable they are for patients with diabetes (Molife 2010).

Furthermore, there are usually several medical explanations for the clinical manifestations of depression. These symptoms are often attributed to the diabetes diagnosis or another comorbidity. Care providers reportedly have difficulty discerning the root cause of the symptoms, and therefore do not make a diagnosis of depression (Molife). Egede and Ellis found similar results. They discussed the difficulty in separating symptoms of depression from symptoms of poor management of diabetes. For example, fatigue, weight changes, and sleep disturbances can all be symptoms of both depression and diabetes (2010).

According to a survey of physicians conducted by Larme and Pugh (1998), diabetes is a complicated disease that is more challenging to treat than other illnesses. For example, medications must be constantly adapted to fit the body's ever changing reactions, much of the outcomes depend on the patient's lifestyle changes (diet, exercise, etc) and are out of the provider's control, the disease affects all of the body's organs biochemically, symptoms do not often correlate with severity, patients are often noncompliant with treatment regimens, the protocols for treatment of diabetes are unclear and varying, and outcomes are still unpredictable even if patient and provider are completely compliant throughout

the course of treatment. For these reasons and more, physicians have difficulty effectively treating diabetes (Larme and Pugh).

Caring for patients with diabetes is arduous, but it stands to reason that adding a comorbidity as complicated as depression will only worsen the outcome of diabetes treatment. In a study that surveyed physicians about depressive disorders, it was discovered that primary care providers possess a high level of confidence regarding depression diagnosis skills, a fact that contradicts the well-documented finding that depression is severely under-recognized. Recognition of depression for these physicians was reportedly primarily driven by an outward appearance of depression. As established in the literature, covert signs of depression are just as important as the obvious ones. These physicians also expressed incomplete knowledge of the National Institute of Mental Health (NIMH) criteria for depressive disorders, hindering their ability to accurately diagnose such disorders (Williams, Rost, Dietrich, Ciotti, Zyzanski, & Cornell, 1999).

In addition to physicians, nurses are also responsible for the lack of recognition of depression in patients with diabetes, as revealed in a study on Diabetes Nurses (DNs) in the Netherlands. The Problem Areas in Diabetes scale (PAID) measures diabetes-specific emotional distress. Patients with high PAID scores were considered to have probable depression. DNs recorded an emotional problem in the medical records of on 20% of the patients with probable depression and 25% of the patients with high levels of anxiety (Pouwer, Beekman, Lubach, & Snoek, 2006).

Furthermore, none of the individuals with increased emotional problems related to the treatment of their diabetes had these problems documented in their records. Of the patients currently seeking treatment from a mental health specialist, only 50% had

documentation of an emotional problem by a DN. Only 9% of depressed patients with type 1 diabetes discussed emotional problems with the DN, as compared to the 57% of depressed patients with type 2 diabetes that discussed these problems with a DN. The reasons behind this finding were not discussed further in the study (Pouwer, Beekman, Lubach, & Snoek, 2006).

Discussion

The reviewed studies found recognition rates of depression in patients with diabetes as low as 20% (Pouwer, Beekman, Lubach, & Snoek, 2006). Although the rates of recognition have increased in recent years, the need for more effective and consistent practice is crucial. The negative outcomes of comorbid depression and diabetes are numerous and extensive, affecting many aspects of the patients' lives. Many of the diagnostic screening tools for depression have been proven to be reliable and valid in patients with diabetes, but are still underused. The availability and accessibility of these tools seems to be underestimated. As mentioned, the diagnostics may yield differing results, clouding the reliability of the tools. However, these screening tools are the most effective early intervention to detect depressive symptoms (Lustman & Clouse, 2005).

The effectiveness of screening tools is irrelevant when they are not being used properly or at all. There are numerous barriers to the recognition of depression in patients with diabetes. Age, gender, and race are all associated with varying degrees of depression symptoms and recognition. Several factors could contribute to discrepancies between different age groups and depression. For instance, younger patients may have increased severity of depressive symptoms due to altered levels of hormones and limbic system activity compared to older adults, leading to an unstable emotional state (Keightley, Chiew, Winocur, & Grady, 2007). Younger patients are also more likely to have type 1 diabetes than type 2, and it is possible that depression could be worse in patients with type 1 diabetes (Wild, Roglic, Green, Sicree, & King, 2004).

Although some studies suggest that men are more likely to voice their feelings related to depression, women are oftentimes thought of as more open about such topics. Care providers may assume women will be more likely to voice depressive thoughts without prompting, and this idea could contribute to the less frequent screening of females for depression. A social stigma could also be present on depressive symptoms in men, and these men, therefore, feel a lack of proper social support (Alexandrino, Alves, Tofoli, Wang, & Andrade, 2011). For this reason, men may hide their depression from physicians. The issue of differences between races is more difficult to attribute to a tangible cause. Documented health disparities between different races and ethnic groups could be due to ancestry, geographic location, diet, culture, and many other variables.

The patients' relationship style can affect how they collaborate with the care providers, how they handle their treatment, and how effective that treatment becomes. These findings suggest that depression treatment needs to be more individualized in order to be effective. A patient's outward expression of depression is another factor that can affect recognition and treatment. Patients with noticeable signs of depression may have a harder time hiding their symptoms due to the severity of their depression, allowing for greater recognition. Primary care providers also have a more difficult time detecting depressive symptoms when they are hidden below the surface.

As discussed, many providers are not properly trained in using the tools that bring those covert signs to light. Even those that do possess this knowledge have poor records of properly diagnosing depression. Diabetes Nurses (DNs) in the Netherlands are thoroughly trained by the Foundation for Specific Postgraduate Education for Nurses, with a strong emphasis on the emotional aspects of diabetes. This knowledge did not prevent these

nurses from recognizing only a fraction of depressed patients. That same study pointed out that other research has shown similar results, and that educating practitioners on the detection of depression had little effect on recognition in practice (Pouwer et al, 2006).

Barriers are not limited to patient characteristics, however. The care provider's attitudes towards diabetes and depression greatly influence recognition, treatment, and outcomes. The burden of treating diabetes successfully can be overwhelming for physicians. Likewise, the recognition and treatment of depression can be equally grueling. Combining the illnesses together increases difficulty exponentially for both patient and provider.

One major contribution of this study is the recognition that research cannot distinguish either party being more at fault for low rates of recognition of depression in these patients with diabetes. The solution to the problem of under-recognition is complicated and involves many participants. The patients must be able to advocate for themselves when they are experiencing depressive symptoms. In some cases, these subjective manifestations are not outwardly visible. The nurses, physicians, and other health care professionals must be adept at evaluating all patients for depression whether they exhibit outward signs or not. Consistent measures must be taken to ensure that all patients are properly diagnosed. Understanding the barriers to recognition is only one step towards improvement.

Limitations of this review include a wide range of recognition rates, which suggests that confounding variables may be present in the literature. Furthermore, the studies are difficult to compare in certain aspects due to innate differences and variances between the studies, such as the definitions of depression, diabetes, and recognition. However, there are

also strengths to this review. Several of the studies produced results that mimic each other, allowing for some degree of generalization. Plus, the reviewed studies were conducted in different geographic areas and by a variety of researchers, eliminating certain biases. Lastly, the results are current as the majority of the studies were published in the last ten years.

Clinical Implications

The nurse is the first line of defense for these patients and must act as patient advocate. As established, physicians only spend brief stints with patients. More responsibility should be put on the nurse to help detect subtle manifestations of depression. The value of nurses in the recognition and treatment of depression in patients with diabetes is immeasurable. Proper education is the first step to understanding comorbid depression in these individuals, including signs and symptoms of depression and therapeutic communication techniques. Nurses must be educated on both overt and hidden clinical manifestations of depression. Facilities should train their nurses to recognize and report these symptoms. Web-based modules can be used to refresh nurses' knowledge annually and keep facilities up-to-date with the proper screening methods.

The nurse should be trained to ask the questions necessary to collect appropriate information regarding psychosocial issues. They must be able to establish a relationship of trust and support with their patients in order to elicit the information needed to accurately diagnose and treat these individuals. The patients should feel safe in an open environment in which they can express their thoughts and feelings freely. Nurses should also be able to recognize subtle clues as to the patient's innermost fears and anxieties.

As established by this review, self-report screening tools are accepted as the best method for detecting depression. Nurses should be trained to use tools such as the Patient Health Questionnaire and Beck Depression Inventory with all patients. Direct questions should be asked to elicit discussion, such as "have you been feeling sad or blue?" Follow-up assessments for at-risk patients should be thorough and consistent, allowing for the proper classification of all cases of depression. The nurse should always voice any concerns regarding the patient's emotional or mental status to the primary care provider for further evaluation. The nurse should encourage other health care professionals to screen their patients for depression as well.

Careful documentation is another key aspect of nursing care related to these patients. Every depressive symptom and statement by the patient should be placed in the medical record for the care team to review so that interventions can be implemented. The nurse should document every action or word that hints at some sort of anxiety or depression and then document his or her reaction towards the patient. The nurse should openly discuss the patient's emotional state and keep a detailed log of the discussion. Further action taken by the nurse or other member of the health care team should also be thoroughly documented.

Collaborative care is essential for these patients. Nurses, physicians, psychologists, and other members of the health care team should work closely together to establish a treatment plan and outcome goals for patients with diabetes, allowing for the immediate detection of complications such as depression in a variety of treatment settings. Consistent and frequent meetings should be held with all team members in attendance to discuss all

holistic aspects of the patient's well-being. Mental and emotional health should be a top priority in the care of patients with diabetes.

Patient education is another important responsibility of the nurse. Educating the patient about the signs and symptoms of depression can facilitate recognition and diagnosis by opening the lines of communication regarding this subject. Nurses should instruct the patient to seek professional help if he or she develops symptoms such as increased fatigue, weight changes, appetite changes, sleep disturbances, and feelings of sadness or anxiety. The value of early detection and treatment of depression should be stressed to the patient.

The patient should also be taught to understand his thoughts, feelings, and actions, and how they relate to his overall state of well-being. The nurse should assure the patient that there is no shame in feeling depressed and that judgments will not be made toward the patient regarding his emotional health. It may help to instruct the patient to keep a detailed, daily log of emotions, symptoms, and diabetes management to help both the patient and nurse recognize and understand subtle changes in mental, emotional, and physical health.

Finally, to ensure the best quality care for all patients, nurses should follow trends in current research regarding depression in patients with diabetes. They should use results of clinical studies to determine best practice, as the complex care for these patients is ever changing and evolving. Facilities should encourage the use of evidence-based practice in the care of their patients.

Patients with diabetes need extra attention regarding their mental and emotional state. Frequent screenings for depression should be performed by all members of the

health care team. Nurses should be able to recognize symptoms of depression, advocate on behalf of the patient to ensure quality care, and follow up with the patient and other members of the health care team to evaluate the outcomes of depression interventions.

Practice Guidelines

The American Diabetes Association states that "key opportunities for screening of psychosocial status occur at diagnosis, during regularly scheduled management visits, during hospitalizations, at discovery of complications, or when problems with glucose control, quality of life, or adherence are identified" (2010, p.S27). According to their standards, practically every moment spent with a patient is a vital time to assess for signs and symptoms of depression.

Similarly, the United States Preventive Services Task Force has found "good evidence that screening improves the accurate identification of depressed patients in primary care settings and that treatment of depressed adults identified in primary care settings decreases clinical morbidity" (2002, p.760). They have established that it is crucial to accurately and promptly screen for depression in order to treat the illness and prevent further complications.

The Veterans Health Administration (VHA) is the nation's most integrated system of health care, and resources are easily accessible to recognize, diagnose, and treat depression. Depression screenings have been mandated in these clinics for over ten years. Nevertheless, recognition rates remain inadequate in patients with diabetes in VHA facilities (Jones & Doebbeling, 2007). This finding implies that diabetes is a risk factor for screening deficit even in the most sophisticated settings. Finally, Molife concluded that

screening for depression in patients with diabetes is effective and efficient, as well as recommended (2010). The time spent with patients is valuable and cannot be wasted. Depression screening tools, when administered correctly, only take away a fraction of this time and save money and time in the long term.

As other studies point out, there are still significant gaps in the research regarding recognition of depression in patients with diabetes. Questions to be answered include: 1) does recognition of depression improve patient outcomes? 2) Is recognition of depression based on a single visit appropriate? 3) What is a reasonable timeframe to determine failure of recognition? Further research is needed to explore these questions.

Appendix

Table 1: Matrix of Articles Reviewed

Author/Date	Title	Design	Methods	Definitions	Findings	Strengths/Limitations
Katon WJ, Simon G, Russo J, Von Korff M, Lin EHB, Ludman E, Ciechanowski P, Bush T 2004	Quality of Depression Care in a Population-based Sample of Patients with Diabetes and Major Depression	Cross-sectional analysis	Demographic and clinical data was compared for those patients whose depression was and was not recognized using a 2-sides Fisher exact test probability test that generates a *P* value for the association of the dichotomous factors or *t*-tests for the continuous data. Logistic aggression analyses were performed to determine the factors that are associated with the recognition of depression.	Depression: Patient Health Questionnaire (PHQ-9)	51% of patients with major depression and diabetes were recognized as depressed, 31% received an adequate dose of antidepressants, and only 6.7% received 4 or more psychotherapy sessions. The patients with recognized depression were significantly more obese and had more primary care visits than those with unrecognized depression. No significant differences were found in IIbA$_{1c}$ levels, smoking, type of diabetes, duration of diabetes,	Limitations: The results may not be generalizable to the population. There is no data on patients with major depression who were effectively treated or who had remission of symptoms. The data may not account for physicians that recognized but did not document the depression. Strengths: It utilized a population-based sample, a stable health insurance system (fewer than 5% disenroll per year), and an automated database on utilization, pharmacy refills, and diagnosis. The study protocol was reviewed and approved by the institutional review boards at the University of Washington and Group

					treatment intensity, Rx risk score, or number of complications between those recognized and not recognized.	Health Cooperative. The results are similar to data from other primary care studies.
Jones LE & Doebbeling CC 2007	Depression Screening Disparities Among Veterans with Diabetes Compared with The General Veteran Population	Cross-sectional analysis	Logistic regression tested for associations between depression screen receipt and screening positive and demographic/clinical characteristics among patients with diabetes.	Diabetes: based off of administrative records Depression: Patient Health Questionnaire 2 Recognition: Receipt of screen in primary care	Seventeen percent of the subjects with diabetes screened positive for depression, which is two times higher than in the general population. Women and subjects with unknown A_{1C} were less likely to be screened for depression, but they were positively associated with screening positive for depression.	Limitations: Screening might not be done in patients already diagnosed with depression or already on treatment. The veterans with diabetes were not compared directly to veterans without diabetes. The diagnosis of diabetes may be misclassified, not generalizable to non-Veterans Health Administration (VHA) populations. Strengths: This study compared high-risk populations and is generalizable to other VHA facilities. The study protocol was reviewed and approved by the institutional review boards of

						Indiana University and VA.
Richardson LK, Egede LE, Mueller M

2008 | Effect of race/ethnicity and persistent recognition of depression on mortality in elderly men with type 2 diabetes and depression | Longitudinal cohort analysis | Followed a cohort of veterans with diabetes and depression for a period of ten years. Analyzed ICD-9 scores documented at follow up visits and cause of death if applicable. | Diabetes: two ICD-9 codes for diabetes

Depression: ICD-9 (296.2, 296.3, 296.5, 300.4, 309.4, and 311)

Persistent Recognition: ICD-9 codes documented at multiple clinic visits | Death occurred in 20.1% of individuals with diabetes and depression and 15.6% in individuals with only diabetes. Mortality risk decreased from 0.80 to 0.58 with persistent recognition. | Limitations: There were limited explanatory variables in datasets. The study used ICD-9 codes instead of diagnostic interviews. Unique characteristics of veterans may limit generalizability.

Strengths: The study was approved by IRB and VA research/development community. There was a large sample size. Comorbidity data was available and treatment of comorbidity was as time-dependent variables. |
| Lustman PJ & Harper GW

1987 | Nonpsychiatric physicians' identification and treatment of depression in patients with diabetes | Cross-sectional analysis | Lifetime psychiatric histories were obtained from 114 patients with DM. Experimental group: reported symptoms of a major depressive episode. Control | Depression: NIMH DIS-3

Recognition: documentation by physician | 64.3% of pts with both depression and diabetes were either incompletely diagnosed or received no psychiatric | Limitations: published in 1987

Strengths: DIS-3 is tested to be sensitive, reliable, and valid. Interviewers were trained to administer |

			group: without psychiatric diagnosis.		diagnosis whatsoever.	the questionnaire. Part of larger investigation – had more access to information.
Pouwer F, Beekman ATF, Lubach C, Snoek FJ

2005 | Nurses' recognition and registration of depression, anxiety of depression, anxiety and diabetes-specific emotional problems in outpatients with diabetes mellitus | Observational study | Analyzed data from a randomized control trial that measured whether monitoring and discussing of psychological well-being in outpatients with diabetes improves the outcomes of patient care. | Depression: Hospital Anxiety and Depression Scale

Diabetes Problems: Problem Areas in Diabetes Scale

Recognition: documentation by nurse in post-visit chart | Was recorded for 23% of patients in control group that emotional problem had been discussed. It was discussed with 50% of patients with current treatment of a mental health specialist and 19% of those not under treatment. Only 25% of patients with high level of anxiety had nurse notes about an emotional problem. | Limitations: This is not primary study. Emotional problems may have been discussed with the patient but not recorded in the medical chart.

Strengths: This study was approved by Medical Ethics Committee of VUMC. Similar studies have found similar results. |
| Lustman PJ, Clouse RE

2005 | Depression in diabetic patients: The relationship between mood and glycemic control | Literature review | Searched PubMed, PsycINFO, and MEDLINE databases | Definitions varied by study. | Depression-specific screening tools validated for patients with diabetes: Beck Depression Inventory, | Limitations: The study did not define what they included as "depression" in their analysis. The study did not mention being approved by a review |

					Depressive Cognition Scale, Structured Clinical Interview – DSM IV, Zung's Screen for Depression, CES-D Screen for Depression, CIDI and CIDI-SF Screens for Depression	board. Strengths: The study analyzed studies performed over a span of more than twenty years.
Ciechanowski PS, Russo JE, Katon WJ, Von Korff M, Simon GE, Lin EHB, Ludman EJ, Young BA 2006	The Association of Patient Relationship Style and Outcomes in Collaborative Care Treatment for Depression in Patients with Diabetes	Randomized controlled trial secondary analysis	Baseline screenings for depression and relationship styles were performed, then the patients were randomly separated to intervention or usual care. x^2 analysis and 2-tailed t tests examined differences between relationship style groups on baseline demographic, clinical, and psychosocial variables and satisfaction measures related to diabetes care.	Depression: Patient Health Questionnaire-9 Attachment Style: Relationship Questionnaire HSCL-20 – measured depression change between baseline, 3-, 6- and 12-month assessments	Of the patients with an independent relationship style, those receiving intervention had more depression-free days than those receiving usual care. Of the interactive relationship style, there was no difference between the two groups. There was no significant interaction between treatment and relationship style groups in	Limitations: The assessment of the process of collaborative care is limited to counts of visits or telephone calls. The data from a depressed sample may not generalize to nondepressed individuals with diabetes or other chronic illnesses. The findings may also not generalize to non-HMO settings or settings in which a significant proportion of patients may not have adequate resources such as insurance or telephone access.

					depression-free days over 12 months. There were no significant interactions between treatment and relationship style group with regard to specialty mental health visits, proportion taking antidepressants, or antidepressant adherence.	Strengths: The study was reviewed and approved by the institutional review boards of the Center for Health Studies at Group Health Cooperative and the University of Washington Department of Psychiatryand Behavioral Sciences.
Pan A, Lucas M, Sun Q, van Dam RM, Franco OH, Manson JE, Willett WC, Ascherio A, Hu FB 2010	Bidirectional Association Between Depression and Type 2 Diabetes Mellitus in Women	Longitudinal Study secondary analysis	Cox proportional hazards models were used to estimate age- and multivariable-adjusted relative risks of both developing type 2 diabetes in participants depressed mood compared to those without and also developing clinical depression in participants with type 2 diabetes	Depression: self-reported symptoms (Mental Health Index-5), use of antidepressants, and diagnosis by a physician Diabetes: atleast one of the following reported according to National Diabetes Data Group criteria: 1. one or more classic	Significant increased risk of developing depression in the diabetic patients compared with nondiabetic patients during the 10-year follow-up	Limitations: The results may not be generalized to the population because the study sample was homogenous. The exact diagnosis date of depression was unavailable, which could lead to reverse causation in the analysis. Information on physician-diagnosed depression and antidepressant use was self-reported.

| | | | | symptoms (thirst, polyuria, hunger, weight loss) and fasting plasma glucose levels of at least 140 mg/dL or random levels of at least 200 mg/dL
2. at least two elevated plasma glucose levels on different occasions in the absence of symptoms
3. treatment with hypoglycemic medication | | Strengths: The possibility of residual and time-dependent confounding was minimized by the use of Cox regression models to incorporate the biennially repeated measurements. They used three separate measures to define depression. Participants with coronary artery disease, cancers, and strokes at baseline that could be associated with mood disorders were excluded. |
| Ciechanowski PS, Katon WJ, Russo JE

2000 | Depression and Diabetes: Impact of Depressive Symptoms on Adherence, Function, and Costs | Secondary Analysis | Two-tailed t tests or x^2 tests with corrections for continuity were used to compare respondents and nonrespondents by age, sex, HbA_{1c} level, and Chronic Disease Score. Analysis of covariance was used to test for differences among depressive | Depression: Hopkins Symptom Checklist-90

Self-Care: The Summary of Diabetes Self-Care Activities

Health & Functional Impairment: Short-Form 12 Health Survey | For diet amount, high- and medium-severity tertiles had significantly worse adherence than did the low-severity tertile. Patients in the high-severity tertile had a significantly greater | Limitations: The small and homogenous sample size may not be generalized to the population. They used self-report questionnaires to diagnose depression.

Strengths: Analyzed data on both type 1 and type 2 diabetes. The data was collected from |

			symptom severity tertiles within each of these domains: HbA$_{1c}$ levels, functional statis, and adherence to diabetes self-care and oral hypoglycemic regimens.	Interruption in medication treatment: an episode in which a refill or subsequent prescription of oral hypoglycemics was overdue by more than 15 days and by more than 25% of the intended duration of use	percentage of interruptions in their use of oral hypoglycemics compared with the low-severity tertiles. Health care costs increased as depressive symptom severity increased.	a study that was approved by the institutional review boards of the University of Washington, Seattle, and GHC.
De Groot M, Anderson R, Freedland KE, Clouse RE, Lustman PJ 2001	Association of Depression and Diabetes Complications: A Meta-Analysis	Meta-Analysis	Meta-analytic statistics for the entire sample of studies were calculated for all complications and diabetes types combines. Studies were aggregated that compared depression ratings of patients with any complication to those without complications. To examine whether the association between depression and diabetes complications differs	Definitions varied by study	Increased depression was consistently associated with increased numbers, severity, or ratings of complications.	Limitations: A limited sample of studies were available for the analysis, which yielded small numbers of studies in each of the subgroup analyses. The Fail Safe N values indicate that additional studies are needed to confidently reject the "file drawer effect." All of the studies available for analysis used cross-sectional designs, rather than prospective longitudinal approaches. Calculation of the effect size in the majority of data

			by diabetes type, studies were aggregated by types of diabetes irrespective of complications. Finally, the studies were aggregated by specific diabetes complications.			aggregations yielded heterogenous variance estimates indicating the possible presence of moderator variables. Strengths: The analysis included studies on both type 1 and type 2 diabetes. The studies were compared for significant p-values.
Egede LE & Ellis C 2010	Diabetes and Depression: Global Perspectives	Systematic Literature Review	A qualitative aggregation of studies were performed.	Definitions varied by study	Individuals with diabetes are more likely to have depression than in individuals who do not have diabetes. Depression was significantly associated with poor glycemic control in individuals with type 1 and type 2 diabetes. There is a significant relationship between depression and treatment nonadherence.	Limitations: The methods used to gather the data were not clearly defined. Strengths: The study emphasizes the need for a collaborative care approach to diabetes and depression management. The studies that were analyzed used reliable and valid measures for depression screening.

					Patients with diabetes and comorbid depression have a 4.1-fold increase odds of disability compared with a 1.7-fold increase in adults with diabetes only and a 1.3-fold increase in adults with depression only. U.S. Medicare beneficiaries with diabetes and major depression sought more treatment for more services, spent more time in in-patient facilities and incurred higher medical costs than adults with diabetes alone. These patients also have a 36-38% increased risk for all-cause mortality over a 2-year period.	

| Hu J, Amoako EP, Gruber KJ, Rossen EK

2007 | The Relationships Among Health Functioning Indicators and Depression in Older Adults With Diabetes | Interviews | Descriptive statistics of the measures were computed to profile participants in the study. A multiple regression was conducted to determine the degree to which respondents' gender, race, comorbidities, symptom distress level, and functional status predict the variance in reported depression. | Symptom Distress: Symptom Distress Scale

Functional Status: Instrumental Activities of Daily Living Scale

Depression: 15-item Geriatric Depression Scale-Short Form | Symptom distress was significantly positively correlated with depression. Functional status was significantly negatively correlated with depression. The number of comorbid conditions, functional status level, and race were negligible predictors of depression. Males were more likely to report depressive symptoms than females. Older adults may display depressive symptoms that do not meet criteria a diagnosis of clinical depression, but these symptoms can still effect their mental | Limitations: Some findings from this study were contradictory to previous studies (females are usually more likely to report depressive symptoms, functional status is usually found to be a significant predictor of depression). The generalizability of the results is limited due to the small sample size.

Strengths: Inclusion criteria included a documented diagnosis of diabetes, ability to speak English, and functional orientation to time place, and person. Approval was obtained from the University of North Carolina's Institutional Review Board and the local Housing Authority. |
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					health, self-care, and quality of life.	
Molife C

2010 | Is Depression a Modifiable Risk Factor for Diabetes Burden? | Literature Review | Primary sources published from January 2000 to April 2009 were gathered from MEDLINE, EMBASE, CINAHL, PsycARTICLES, SocINDEX, PsycINFO, Cochrane Databases, and Cochrane Database of Systematic Reviews. *Depression* and *diabetes* were used as the main key words. | Depression: dysphoric mood, syndromal depression, all forms of unipolar and bipolar depressive disorders | Factors that affect depression diagnosis and management: brief visits, poor integration with specialized psychological health care, a false perception by some primary care providers who still believe that comorbid depression is a plausible and justifiable outcome of diabetes, limited knowledge of available and essential diagnostic elements or concern over their validity and reliability with diabetes, attributing symptoms of depression to the | Limitations: Associated findings of the studies may be subject to selection bias and may not be generalizable due to their convenience sampling or recruiting techniques. Causal relationships cannot be made between diabetes and depression because the studies used a cross-sectional design to assess the relationship.

Strengths: To maximize the search and minimize publication bias, additional sources were explored: books, doctoral theses, non-peer-reviewed journals, references listed in reviews and/or primary sources, and meeting abstracts. |

						diabetes.
Anderson RJ, Freedland KE, Clouse RE, Lustman PJ 2001	The Prevalence of Comorbid Depression in Adults with Diabetes	Meta-Analysis	Published studies that measured prevalence of depression in adults with diabetes were identified from MEDLINE and PsycINFO. x^2 statistics and odds ratios were used to assess the rate and likelihood of depression as a function of type of diabetes, sex, subject source, depression assessment method, and study design.	Major depressive disorder was assessed with structured or semistructured diagnostic interviews or self-report symptom scales. Depression prevalence was calculated as an aggregate mean, weighted by the number of subjects in the study or grouping of interest.	Diabetes doubles the odds of depression. The odds ratio of depression is more consistent across studies than is the prevalence, which varies by sex, study design, subject source, and method of depression assessment. The odds of depression were significantly higher in women than in men. The prevalence of depression varied systematically as a function of the method used to identify depression cases and the study design.	Limitations: Publication bias may limit the generalization of the results. Depression prevalence estimates may be unstable due to the small sample sizes of some studies, the small number of studies, and the fact that many of the samples were not population based. The methods used to calculate the prevalence of depression were suboptimal in that they were unable to perform a multivariate analysis. Strengths: The findings are similar to those reported in earlier literature reviews. Odds ratios were uniformly similar in bivariate tests.
Verma SK, Luo N,	Impact of Depression on	Cross-sectional	A two-step regression analysis	Depressive symptoms were	Patients with diabetes mellitus	Limitations: Some patients who were

Subramaniam M, Sum CF, Stahl D, Liow PH, Chong SA 2010	Health Related Quality of Life in Patients with Diabetes	analysis	was conducted for identifying factors affecting patients' quality of life.	assessed using the Center for Epidemiological Studies Depression Scale Health-related Quality of Life (HRQOL) was assessed using the Short Form 36 Health Survey	had poorer HRQOL than the general population. There was a negative association between medical complications of stroke and retinopathy with the physical functioning and role physical domains of HRQOL. Presence of depressive symptoms had the most significant negative effect on HRQOL. Comorbid states of depression and diabetes showed even greater decrements in health than the addition of the two conditions separately.	approached did not consent to the study. Cross-sectional design did not allow to ascertain the temporal and potentially complex relationship between depression and HRQOL. Strengths: Similar results have been reported from previous studies. Nonparticipation rate was low (6.1%) and analysis of available limited data on these subjects indicated that this group was not different in terms of age, gender, and ethnic composition from the study participants. Written informed consent was obtained from all subjects and the study was approved by the Institutional Ethics Committee.
Gonzalez JS, Safren SA, Cagliero E,	Depression, Self-care, and Medication	Cross-sectional analysis	Surveyed 879 type 2 diabetes patients who were followed	Depression was assessed using the Harvard	19.3% of the patients met HANDS criteria	Limitations: The cross-sectional nature of the design does not allow

| Wexler DJ, Delahanty L, Wittenberg E, Blais MA, Meigs JB, Grant RW

2007 | Adherence in Type 2 Diabetes | | in one of two outpatient primary care medical clinics between December 2001 and July 2003. Descriptive statistics were calculated for all study variables. | Department of Psychiatry/National Depression Screening Day Scale (HANDS).

Diabetes self-management was measured using the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA). | for a diagnosis of major depression. 66.% reported at least some depressive symptoms without meeting criteria for major depression. Only 59.4% of subjects with probable major depression had depression listed in their medical records. Major depression was significantly associated with poorer adherence to general dietary and exercise recommendations. Major depression was associated with a 2.31-fold increase in the odds of missing one or more prescribed medications over the previous 7 days. Logistic regression | for causal inferences. Self-care and adherence behavior were measured via self-report, which may overestimate true values.

Strengths: Participants provided informed consent. The sample size was large and the measures of self-care and depression are validated and sensitive. |
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					showed that every 1-point increase in the HANDS symptom severity score was associated with a 1.10-fold increase in the odds of missing one or more doses.	
Williams JW, Rost K, Dietrich AJ, Ciotti MC, Zyzanski SJ, Cornell J 1999	Primary Care Physicians' Approach to Depressive Disorders	Qualitative Questionnaire	x^2 tests for contingency tables and linear and logistic regression parameter estimates incorporated the post stratification weights in their computation. Regression analyses were used to examine the association between physician specialty, type of depression, and degree of capitation with the physicians' practice patterns and barriers to care while controlling for differences in patient characteristics.	Major depression was described as depressed mood or anhedonia plus substantial additional symptoms of depression and impairment of social functioning or work performance Mild depression was defined as depressed mood or anhedonia with mild impairment of social functioning or work performance, and symptom duration of less than 2 years.	Physicians expressed high confidence in their skill at diagnosing depression. Recognition is triggered by patient cues such as depressed appearance. Minimally capitated physicians were more likely to cite financial barriers, and fully capitated physicians were more likely to cite "inadequate time for counseling." Patient barriers were not	Limitations: The response rate was only moderate. These data are from self-reports and do not measure actual practice. Strengths: There was a large sample size. Design weights were used to compensate for the oversampling of specific strata. Nonresponders were more likely to practice in fully capitated settings but did not differ significantly from responders in their diagnostic or treatment approach or perceived barriers to best practice.

					associated with type of depression, physician specialty, or practice structure. Physicians were less satisfied with referrals to mental health specialists than to medical subspecialists. Antidepressant medication was the preferred therapy for depression.	
Larme AC, Pugh JA 1998	Attitudes of Primary Care Providers Toward Diabetes	Qualitative and Quantitative Interviews	Using the nonparametric quantile test, statistical significance was tested for quantitative data. For the qualitative data, a content analysis of the responses was performed to determine common themes among answers.	Diabetes was defined as having a documented diagnosis of either type 1 or type 2 diabetes.	Physicians described diabetes as being more complicated to treat than other disorders for the following reasons: medications must be constantly adapted to fit the body's ever changing reactions, much of the outcomes depend on the	Limitations: The interviews were conducted with physicians all from clinics in south Texas. May not be generalizable to other geographic regions and practice settings. Strengths: Provider attitudes in this study closely parallel themes in the patient literature on adherence to

					patient's lifestyle changes (diet, exercise, etc) and are out of the provider's control, the disease affects all of the body's organs biochemically, symptoms do not often correlate with severity, patients are often noncompliant with treatment regimens, the protocols for treatment of diabetes are unclear and varying, and outcomes are still unpredictable even if patient and provider are completely compliant throughout the course of treatment.	diabetes treatment regimens. Generalizability to other providers is possible based on the connection to other literature. Provider sample was diverse.

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