Depression In Older Males With Type 2 Diabetes

By

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To the faculty of Washington State University:

The members of the committee appointed to examine the Intercollegiate College of Nursing research requirements and manuscript of LAURIE EDINGER SPENCER find it satisfactory and recommend that it be accepted.

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Abstract
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By Laurie Edinger Spencer

Washington State University, May 2002

Chair: Dr. Cindy Corbett

This manuscript examines, through a comprehensive review of the literature, depression and type 2 diabetes among older males. Type 2 diabetes is a chronic illness, which has multiple demands that are correlated to depression. Depression is associated with hyperglycemia in patients with type 2 diabetes. There is a significant association between depression and poor glycemic control. Depression rates are higher among patients with type 2 diabetes than patients without diabetes. This manuscript will provide insight into the demands of illness and identify what the contributing factors are related to depression among older males with a diagnosis of type 2 diabetes. Screening and treatment options for depression are described in older males with type 2 diabetes. Limitations of the literature are discussed and recommendations for improving practice through theory-based research are provided.
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Introduction

Diabetes is a public health problem of pandemic proportions. Approximately 800,000 new cases of diabetes are diagnosed every year, and approximately one third of the people who suffer diabetes symptoms are not aware they have the disease (CDC: Diabetes becoming epidemic, 1999). Diabetes is projected to rise from 16 million in 2000, to 29 million in 2050, an increase in prevalence of 7.22% (Boyle et al., 2001). In 1996 there were 104,900 males over age 64 that were diagnosed with diabetes (see Table 1). The incidence of diabetes in 1996, per 1,000 males above 65, is 7.30 (see Table 2). The incidence of diabetes in men aged 75 and older is projected to rise 437% by 2050, the largest increase of all sub-groups (Boyle et al., 2001). Due to substantial increases in life expectancy, the number of older adults with chronic diseases will remain high (CDC: Blackman, Kamimoto, & Smith, 2002) (see Table 3). Currently, more than 30% of persons aged 60 or older have either diabetes or impaired fasting glucose (Shorr, Franse, Resnick, Bari, Johnson & Pahor, 2000), now referred to as pre-diabetes (ADA, 2002).

Diabetes is a demanding illness requiring people to adjust their aspirations, lifestyle and employment (Haberman, Woods & Packard, 1990; Turner & Kelly, 2000). Persons with diabetes have to learn to recognize body responses that lead to hyper or hypoglycemia and how to test their blood sugar level to validate the cues (Paterson, Thorne & Dewis, 1998). Diabetes is one of the most demanding chronic illnesses on a person's psychological and behavioral well being (Whittemore, 2000). Diabetes demands include prevention
and management of medical crisis, treatment regimens, and symptoms, while attempting to normalize social and environmental lifestyles, despite these demands (Woods, Haberman & Packard, 1993).

As with most chronic diseases, the ongoing management of type 2 diabetes is the responsibility of the client and his or her significant other(s) with health care professionals generally providing a consultative role. As the disease progresses, complications may include a wide range of problems such as pain, changes in lifestyle and vocation, physical disability, and life-threatening cardiovascular or other events that create a need for hospitalization (National Center For Chronic Disease Prevention, 2002). Each of these problems and events bring about either temporary or permanent self-care responsibilities for persons with diabetes.

“Direct psychological consequences can arise from any one of these factors, making it harder for patients to treat their diabetes and live productive, enjoyable lives” (National Center For Chronic Disease Prevention, 2002). The Center For Disease Control (CDC) acknowledges that diabetes-associated cognitive changes are not well understood. Older persons who have type 2 diabetes and other symptomatic medical conditions have a higher risk of developing psychological problems and possibly depression. Data provided on the CDC website shows that persons with diabetes are sad 9.4 days out of a mean of 30 days (see Table 3). The implications of this alteration in mood are unclear.
Depression affects nearly 5 million of the 31 million Americans aged 65 and older (Kurlowicz, 1999). Depression is common among persons with diabetes. It is estimated that depression rates are greater than 30% in persons with diabetes and the odds of depression among persons with diabetes in controlled studies were twice that of persons without diabetes regardless of gender (Anderson, Freedland, Clouse & Lustman, 2001). Depression is associated with poor glucose control in people with type 2 diabetes (Lustman, Anderson, Freedland & de Groot, 2000). Thus, clients with diabetes and depression are at a higher risk for acute and chronic diabetes-related complications as a consequence of poor glucose control.

Statement Of Purpose

This manuscript explores the pathophysiologic changes and psychosocial factors that contribute to depression in older males with type 2 diabetes. Pharmacological and psychosocial treatment options for depression are examined to provide practitioners with information to improve outcomes. Implications for theory-based research are proposed to enhance knowledge about the relation between diabetes and depression.

Theoretical Framework And Model

The Interaction Model of Client Health Behavior (IMCHB) is a theoretical framework that can guide future studies to examine depression in relation to demands of illness in older males with type 2 diabetes (see Table 4). The IMCHB emphasizes the process by which each client’s background variables
impact health perceptions such as cognitive appraisal and affective response, client-professional encounters and, ultimately, health outcomes.

As shown, the IMCHB provides a logical structure for data interpretation and demonstrates the need for clinicians to engage the client in the care process to improve self-management skills. Assessing client characteristics, involving clients in decision-making, and individualizing care based on various aspects of clients' singularity has been shown to improve client outcomes (Corbett, 1999; Cox & Roghmann, 1984).

Although terminology does not reference the IMCHB, a meta analysis (Whittemore, 2000) of 72 articles identified multiple factors of Client Singularity and perceived barriers related to persons with diabetes and their health experiences (see Table 5). Client Interaction was addressed and is shown to promote coping skills related to cognitive and affective responses. The client provider interactions are connected to client perceptions and outcomes.

Review of Literature

*Pathophysiology Changes Associated With Depression In Type 2 Diabetes*

Type 2 diabetes is a progressive disease characterized by insulin resistance and pancreatic B cell dysfunction (Expert Committee On The Diagnosis And Classification Of Diabetes Mellitus, 2001). Insulin resistance is a failure of insulin to suppress hepatic glucogenesis and glucose secretion, which leads to hyperglycemia. Decompensation occurs, as the impaired B cells are unable to produce sufficient insulin to overcome insulin resistance. Insulin levels remain elevated above normal, until later progression of the disease
characterized by impaired fasting plasma glucose levels (Reasner & Defronzo, 2001). "Insulin suppresses gluconeogenesis by decreasing expression of the genes for the gluconeogenic enzymes and decreasing the activity of glucose-6-phosphatase that controls the release of glucose into the circulation" (Wolf, 2001, pg. 178).

Neurovascular changes are associated with diabetes progression, and the development of organic affective illness in certain cases of depression (Polonsky & Parkin, 2001). Persons with diabetes may have increased depression due to lack of glucose control, which may result from changes in the autonomic nervous system, the hypothalamic-pituitary adrenal axis or neurotransmitters (Ciechanowski, Katon, & Russo, 2000).

Peyrot and Rubin (1999) reported that data showed greater than 40% of persons with diabetes had levels of depressive symptoms consistent with a psychiatric diagnosis. The exact causes for depression remain unclear. Neurotransmitters, such as norepinephrine and serotonin have been studied to look for a linkage to depression (Robinson, Chemerinski, & Jorge, 1999).

Robinson et al., (1999) reported an increase in parlimbic mu opiate receptor binding in depressed clients. The relationship of related change in the opiate receptor binding is unknown, however, the studies have led to proposed pathophysiologic mechanisms of depression.

There is a reliable, measurable component from serotonin in the central nervous system (CNS), called 5-hydroxyindoleacetic acid (5-HIAA). Depressed persons have decreased CNS levels of 5-HIAA. This implies there is either less
serotonin released in the brain or there is excessive pre-receptor uptake of serotonin. In cases of attempted suicide, significantly lower levels of 5-HIAA have been found (Asberg, Traskamn, & Thoren, 1976).

Depression And Diabetes In Older Males

Chronic illness, such as diabetes, is a major contributing factor in depression (Whall & Hoes-Gurevich, 1999). The incidence of depression in older persons increases as physical health diminishes (Luddington, 1999). Depression in the elderly is often masked by multiple factors that distract providers from diagnosing depression due to the aging process (McGiveney, Mulvihill & Taylor, 1994). Depression can be difficult to diagnose in the elderly and the medically ill (Turner & Kelly, 2000). Unrelenting grumpiness in some elderly may lead practitioners to overlook a diagnosis of depression. Signs and symptoms of depression among the elderly manifest in a variety of ways, such as, negative attitude, decreased or no appetite, overuse of nicotine or alcohol, weeping at good and bad news, sitting for hours and staring into “space” and preoccupation with death (Whall & Hoes-Gurevich, 1999).

Yesavage, who is the co-founder of the Geriatric Depression Scale stated, “A reduction of certain adrenergic receptor binding sites have been found in some elderly persons. These deficits may predispose elderly persons to the development of primary depression” (1991, p.1032). A monotonic decrease in the proportion of people with depressive symptoms experiencing insufficient endogenous insulin levels have been demonstrated (Peyrot & Rubin, 1999).
In the Cardiovascular Health Study (CHS), more than three quarters of older patients using drug therapy prescribed to treat diabetes, failed to achieve fasting plasma glucose of less than 120 mg/dl (Shorr et al., 2000). However, there were no significant glucose differences in levels in older versus younger respondents of the NHANES III survey. Older adults in the NHANES III survey and the CHS trial were already using drug therapy and may require even more intensive treatment to achieve improved glycemic control (Shorr et al., 2000). Insulin resistance causes hyperglycemia and is associated with obesity and cardiovascular risk factors that lead to complications associated with disease and reduction in the quality of life (American Diabetes Association, 2001).

**Disease Progression, Complications And Contributing Factors In Older Males Diagnosed With Type 2 Diabetes**

The role of hyperglycemia in depression has been controversial, although depression has a marked affect on quality of life (Hanninen, Takala, & Keinanen-Kiukanniemi, 1999). Depression is associated with A1c levels greater than 9% (Hanninen et al., 1999). Lustman et al. (2000) conducted a meta-analysis of 24 studies to clarify the association between depression and glycemic control. Depression was quantified by using self-report instruments, such as the Beck Depression Inventory and the Center for Epidemiological Studies-Depression Scale. Depression was significantly associated with glycemic control ($Z=5.4$, $P<0.0001$). The meta-analysis confirmed the association of depression with hyperglycemia, but did not reveal the mechanism or the direction of the association. “Depression may be a cause or a consequence of hyperglycemia”
Small, persistent elevations in A1c significantly increase the risk of major diabetes complications. One example sited by Lustman and colleagues, is that a decrease in A1c of 1%, from 9.5% to 8.5%, was associated with a 33% reduction in the progression rate of retinopathy. Further, findings revealed that depression was associated with significantly higher A1c levels. The data suggest that diabetes complications are linked to depression. The moderating factor in the relationship may be increased illness demands and the adverse impact of symptom burden, functional impairment, and self-management of illness (Ciechanowski et al., 2000).

In a study of 58 women with non-metastatic breast disease, 36 with fibrocystic breast changes, and 31 with diabetes, the women with diabetes reported the highest ongoing treatment issues and experienced more overall demands of illness than the other groups of women (Packard, Haberman, Woods & Yates, 1991; Woods, Haberman & Packard, 1993). Demands of diabetes are related to quality of life. Quality of life has been defined as the functional effect of an illness and its consequent therapy upon a patient, as perceived by the patient (Grady, Jalowiec, & White-Williams, 1998).

Anderson et al., (2001) reported that diabetes doubled the odds of co-morbid depression. The objective of the study was to estimate the odds and prevalence of clinically relevant depression in adults with type 1 or type 2 diabetes. Depression was found to occur in both men and women equally, however, elderly men were at higher risk for undetected depression.
Ciechanowski et al., (2000) determined that depressive symptom severity was associated with a non-significant increase in A1c. This study indicated that higher levels of depressive symptom severity were associated with significantly worse mental and physical functioning. In addition, quality of life was reduced because of a higher probability of complications. These results were obtained through a questionnaire administered to 367 people with type 1 and type 2 diabetes. Data such as demographics, depressive symptoms, diabetes knowledge, functioning, and self-care along with other operational measures were obtained. Depressive symptom severity was associated with diet, medication adherence, and functional impairment.

Franciosi, Pellegrini, Berardis and Belfiglio (2001) measured quality of life through a framework of outcomes. Diabetes-related measures included stress, health distress and worries. Results revealed that poorer psychological well being was related to the feeling of powerlessness caused by the inability to improve in health status. Findings suggest that empowering clients to more actively and astutely manage chronic diseases, such as diabetes, may improve quality of life.

Complicating And Contributing Factors

Diabetes is a progressive chronic illness, which has significant morbidity and mortality (Peyrot & Rubin, 1999). Studies support a correlation between glycemic control and complications from type 2 diabetes (American Diabetes Association, 2001). There is a higher prevalence of cardiovascular disease among persons with diabetes, than among those without diabetes (Barzilay et al.,
Adults with diabetes have cardiac disease and risk of stroke 2-4 times higher than adults without diabetes (Whittemore, 2000). Type 2 diabetes is a risk factor for stroke, linked with vascular dementia according to the Rotterdam Study done by Ott, Stolk, van Harskamp, Pols, Hofman & Breteler (1999) who concluded that diabetes attributes a risk of 8.8% for dementia, which may contribute to a substantial proportion of all persons with dementia. Other diabetes-related complications include chronic renal insufficiency as a consequence of elevated A1c and lipid levels (Hsu, Bates, Kuperman & Curhan, 2000).

Erectile dysfunction (ED) is a common complication among males with diabetes. Complete impotence is three times greater (28%) in males with diabetes than those without diabetes. Study findings have linked depression and ED in males with diabetes (De Berardis, Franciosi, Belfiglio & Di Nardo, 2002). De Berardis and colleagues sampled male respondents (N=1,620) and found patients with ED reported a higher prevalence of depressive symptoms than reported in other studies involving adults with diabetes. Supporting the results of other aforementioned studies, De Barardis et. al., (2002) also reported that depression was a risk factor for cardiovascular events, hypertension and mortality (De Berardis et.al., 2002). “Research has revealed that people who are depressed are four times as likely to get heart disease, as non-depressed people. Among people who already have heart disease those who are depressed have four times the risk of dying,” therefore, depression and diabetes is a deadly duo (Roberts, 2000, p. 41).
Complicating factors such as macrovascular and microvascular changes that cause illness contribute to depression. Transient depressive symptoms may reflect a response to life circumstances, yet, biological disease-related factors are more strongly associated with persistent depression rather than depression at a single point in time (Peyrot & Rubin, 1999). The onset of diabetes “can trigger depression through either psychological or biological processes, the reverse is also true, depression increases risk for subsequent medical disorders” (Peyrot & Rubin, 1999, p. 452).

Management Of Depression In Older Males With Type 2 Diabetes

Screening Activities

The comprehensive literature review by Whittemore (2000) and the meta-analysis by Lustman et al., (2000); Anderson et al., (2001) provide evidence that depression and the clinical management of depression can impact diabetes-related health outcomes (see Table 5). It is essential to diagnose and treat depression in patients with diabetes. Even mild depression may reduce motivation to gain access to medical care or to follow treatment plans (Turner & Kelly, 2000). Depression was significantly higher in patients with diabetes versus control subjects regardless of whether depression was assessed by interviews or with self-reported scales (Anderson et al., 2001). According to Anderson, et.al., “the lifetime prevalence of depression was significantly higher in those with diabetes than in control subjects [17.5% vs. 6.8%]” (2001, p. 1072).

Studies show that as many as one in every three persons with diabetes has depression at a level that impairs functioning and affects their quality of life,
(Anderson, et al., 2001). Yet many older persons with diabetes are never diagnosed nor treated for depression. Based on a study using the Geriatric Depression Scale (GDS) to screen elders for depression, up to 50% of those with depression remain undiagnosed by their providers (Whall & Hoes-Gurevich, 1999). Other researchers report even more alarming results among clients with diabetes. Nearly 1.4 million physician office encounters with clients with diabetes were retrospectively evaluated. Of those encounters, only 1.25% had a documented diagnosis of depression and only 1.16% received antidepressant pharmacotherapy during the six years (1990-1995) of the study (Sclar, Robinson, Skaer, & Galin, 1999). The reasons for the low rates of diagnosed depression and treatment among clients with diabetes is not well understood. Sclar et al., (1999) recommend further research to identify factors associated with diagnosing depression so that continuing education can be offered to providers to improve care.

In both research and practice the Geriatric Depression Scale (GDS) is a useful screening tool for older males with diabetes. The 30 item GDS was designed as a self or interviewer administered screening instrument (Arthur, Jagger, Lindesay, Graham, & Clarke, 1999). The GDS has very good reliability (alpha = .94), suggesting a high degree of internal consistency. Crook and colleagues (1983) used a constrained groups approach to test construct validity. Three groups of persons with know affective status, non-depressed, mildly depressed and severely depressed, completed the GDS. The scores between the three groups were significantly different in the expected direction providing
strong evidence of construct validity \[ F(2, 97) P=99.48 \]. The GDS remains 
accurate whether the client's cognitive abilities are intact or impaired (Burke, 

Treatment

"Successful treatment of depression is associated with improvements in 
is considered an essential component of high quality care for clients with chronic 
ilness. Depression is not a part of the natural aging process and is often 
reversible with prompt, appropriate treatment. When left untreated in the elderly, 
depression may result in suicide, physical, cognitive, social impairment and 
delayed recovery from medical illness (Kurlowicz, 1999). Studies show 
chronically ill clients with depression are likely to experience a higher burden of 
disease specific symptoms when compared to chronically ill persons without 
depression (Ciechanowski et. al., 2000). Psychological support and chronic 
ilness management, education and training may help improve glycemic control 
and thus improve overall well being (Lloyd, Dyer & Barnett, 2000). Teaching, 
guiding, counseling, and problem solving are as effective and acceptable for the 
treatment of depression as amitriptyline (Mynors-Wallis, Gath, Lloyd-Thomas & 
Tomlinson, 1995).

Braden (1992) performed research to examine the effectiveness of a self- 
help education program for clients with chronic illness, comparing depressed and 
non-depressed participants. The research findings suggest that client 
perceptions regarding their severity of chronic illness affect learning abilities and
coping skills. Client perceptions were changed through involvement in a self-help education program. Results show improved enabling skills, self-efficacy, self-worth and decreased levels of depression (Braden, 1992).

A study done by Lustman, Griffith, Freedland, Kissel and Clouse, (1998) found that cognitive behavior therapy for depression in clients with diabetes and supportive diabetes education is an effective non-pharmacological treatment for major depression in patients with type 2 diabetes, and "may also be associated with improved glycemic control" (p.613). Optimal depression treatment involves a combination of cognitive and supportive psychotherapies that incorporate awareness of grief and loss in relation to the disease process (Turner & Kelly, 2000).

Review of the research literature revealed three trials in which the active treatment with antidepressant medications was significantly more effective, than the control treatment in relieving depression in adults with diabetes (Lustman, et.al., 2000). However, antidepressant drugs may aggravate the patient's medical condition; thus, selecting an antidepressant requires careful assessment of the risks and benefits (Turner & Kelly, 2000). There are numerous antidepressant medications as shown in Table 6. Choosing the course of therapy depends on the severity of depression, the associated symptoms, and other physiologic parameters such as renal and liver function (Luddington, 1999). In general, pharmacotherapy for the older client may include any of the selective serotonin reuptake inhibitors (SSRI's). If the client has insomnia, Remeron (Mirtazapine) may be a good option (Luddington, 1999).
Special Considerations For Practitioners

Practitioners often fail to consider or miss a diagnosis of depression, leaving it under treated. Practitioners must curb their assumptions that abnormal behavior patterns among the elderly are expected and think about what the behavior patterns manifest (Whall & Hoes-Gurevich, 1999). In patients with diabetes approximately 33% have depression. Among depressed patients with diabetes two-thirds are left under treated by practitioners (Anderson, et.al., 2001). According to Turner and Kelly (2000) chronic medical conditions may provoke feelings of anxiety, inadequacy, and an emotional burden on the practitioner due to the complex care needs. In addition, practitioners have challenges in responding appropriately to the psychological, social and cultural dimensions of illness and health, and may need to elicit multidisciplinary support.

Annual elderly health exams were designed to detect and treat illness commonly associated with aging. Routine screening for depression should be an integral part of the annual physical exam. When annual physical exams are done thoroughly and inclusive of depression screening, a significant amount of hidden morbidity may be detected (Arthur et. al., 1999).

Implications for Research, Clinical Practice, and Theory Development

In addition to a lack of empirical research linking diabetes and depression, the extant research literature is replete with methodological limitations. The correlational studies that identify a relationship between depression and hyperglycemia fail to establish the direction of the relationship. Moreover, identifying causal factors of depression in people with type 2 diabetes is
confounded by time, the episodic nature of diabetes, and by individual differences (Lustman, et al., 2000). More studies are necessary to identify variables that directly and indirectly affect and aggravate illness, trigger depression, and/or worsen hyperglycemia in clients with type 2 diabetes.

Although, studies have confirmed depression and a reduced quality of life among persons with type 2 diabetes, the studies do not address how many clients with type 2 diabetes have a decreased quality of life and how their practitioners can impact the negative factors affecting their quality of life.

Given the multiple physical, psychosocial, and lifestyle demands of diabetes, the relationship between depression and illness demands in persons with diabetes is an area in need of further research. Haberman et al., (1990) developed a reliable and valid tool, the Demands of Illness Inventory (DOI) to measure the relationship between demands of illness and quality of life. Additional research is needed to develop a reliable and valid shortened version of the DOI that can be used as a quick clinical assessment tool. In other chronic illnesses, depression has been associated with greater illness demands (Oakley & Kane, 1999). More research is needed to link diabetes demands, depression, and client outcomes to various psychosocial, self-management and pharmacological interventions.

There is a lack of longitudinal and correlation studies to establish the variables that directly and indirectly effect and aggravate illness, variables that trigger depression and hyperglycemia in clients with type 2 diabetes and, conversely, variables that contribute to positive outcomes. Although, studies
confirm depression and reduced quality of life among persons with type 2 diabetes, the studies do not address the relationships between quality of life and clients’ unique characteristics including background variables, cognitive appraisal and affective response. There is a knowledge gap about factors that impact depression in clients with type 2 diabetes, as well as in outcomes of methods that health care providers may use to decrease the negative factors that affect quality of life. Thus, studies that allow testing of predictive models and the impact of interventions are required to improve practice and client outcomes.

There are many implications for clinical practice. Assessing clients with type 2 diabetes and managing glycemia requires a holistic nursing framework. Providers need to screen and treat the mental well being of older males with type 2 diabetes to ensure optimum health. The clinical assessment of depression in males with type 2 diabetes should be a routine practice. Clinician’s can suspect a direct relationship between the number and intensity of diabetes-related demands and level of depression. Persons who present with psychosocial, treatment-related, or acute and chronic symptom management demands should be assessed for depression and the possible use of an antidepressant medication and/or cognitive behavioral interventions. Additional research, grounded in theory, is required to provide clinicians with evidence-based practice interventions.

Whittemore stated that, “Theoretically grounded research in diabetes is imperative for the future” (2000, p. 232). The Interaction Model of Client Health Behavior provides a theoretical foundation for guiding research and clinical
practice. More conceptual elaboration is needed to link this model with the empirical evidence that documents a relationship between diabetes, illness demands and depression. Although there is evidence to suggest the effectiveness of diverse interventions, including self-management training, counseling, and pharmacotherapy to improve depression and diabetes-specific outcomes, the theoretical basis for establishing the effectiveness of various therapeutics remains obscure.

Summary

This manuscript describes the relationship of type 2 diabetes and depression. Evidence suggests that demands of illness are a contributing factor in depression with direct and indirect affects. Depression treatment is examined from both pharmacological and non-pharmacological modalities. Treatments may include various antidepressant medication options or embrace psychosocial and educational strategies to address client specific demands of illness. Practitioners are encouraged to screen and treat depression in older males with type 2 diabetes and develop individualized therapeutic plans in collaboration with clients. Practical guidelines are provided for clinicians to assess the elements that contribute to depression in males with type 2 diabetes. The literature reveals a significant association between hyperglycemia, depression, and the demands of illness, however, it is not know what the causal relationship is. Depression may be a cause or consequence of hyperglycemia and the moderating factor may be diabetes illness demands. The multifactorial pathways remain undefined. The gap in the literature indicates a lack of knowledge regarding direct and indirect
affects of the demands of illness, related to diabetes. Recommendations for further theoretical based studies are necessary to determine the causative pathways. Client perceptions related to the demands of illness in correlation to type 2 diabetes and depression should be explored using the Interaction Model of Client Health Behavior to achieve optimum health outcomes.
## Table 1

**Number Of Persons With Diagnosed Diabetes, Males, By Age, United States, 1990-1996** (copied from the CDC website.)

*Table 1: Number of Persons with Diagnosed Diabetes, Males, by Age, United States, 1990-1996*

* Number in thousands, three-year moving average.

<table>
<thead>
<tr>
<th>Year</th>
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<td>1541</td>
<td>1049</td>
<td>653</td>
<td>3795</td>
</tr>
</tbody>
</table>

Centers for Disease Control and Prevention, Diabetes surveillance (1999).
Table 2
Incidence Of Diabetes Per 1,000 Population, Males, By Age, United States, 1990-1996 (copied from the CDC website).

**Table 2: Incidence of Diabetes Per 1,000 Population, Males, by Age, United States, 1990-1996**
* Number in thousands, three-year moving average.

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<th>Year</th>
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<th>65+</th>
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<td>7.30</td>
<td>2.59</td>
<td>2.60</td>
</tr>
</tbody>
</table>

Centers for Disease Control and Prevention, Diabetes surveillance (1999).
Table 3: Adult Health-related quality of life by main cause of activity limitation.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>% of adults</th>
<th>Not good physical health</th>
<th>Not good mental health</th>
<th>Healthy Days</th>
<th>Activity Limitation</th>
<th>Pain</th>
<th>Sad, Blue, Depressed</th>
<th>Anxious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression/anxiety/emotional problem</td>
<td>0.4</td>
<td>9.8</td>
<td>15.7</td>
<td>9.0</td>
<td>13.1</td>
<td>7.2</td>
<td>18.6</td>
<td>19.0</td>
</tr>
<tr>
<td>Cancer</td>
<td>0.3</td>
<td>16.4</td>
<td>9.3</td>
<td>10.8</td>
<td>12.9</td>
<td>12.1</td>
<td>10.0</td>
<td>11.1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>0.4</td>
<td>13.1</td>
<td>7.0</td>
<td>14.5</td>
<td>9.8</td>
<td>8.7</td>
<td>9.4</td>
<td>9.4</td>
</tr>
<tr>
<td>Stroke problem</td>
<td>0.3</td>
<td>12.6</td>
<td>4.1</td>
<td>17.0</td>
<td>8.0</td>
<td>7.1</td>
<td>6.7</td>
<td>8.1</td>
</tr>
<tr>
<td>High Blood Pressure</td>
<td>0.2</td>
<td>9.9</td>
<td>6.3</td>
<td>14.8</td>
<td>7.5</td>
<td>7.4</td>
<td>8.8</td>
<td>7.7</td>
</tr>
<tr>
<td>Back or neck problems</td>
<td>3.2</td>
<td>10.2</td>
<td>6.1</td>
<td>16.9</td>
<td>7.1</td>
<td>13.5</td>
<td>7.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Heart problem</td>
<td>1.5</td>
<td>11.2</td>
<td>4.5</td>
<td>17.1</td>
<td>6.7</td>
<td>7.4</td>
<td>5.5</td>
<td>7.2</td>
</tr>
<tr>
<td>Lung/breathing problem</td>
<td>1.3</td>
<td>10.1</td>
<td>5.2</td>
<td>16.9</td>
<td>6.4</td>
<td>6.2</td>
<td>6.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Walking problem</td>
<td>1.2</td>
<td>10.8</td>
<td>3.7</td>
<td>17.8</td>
<td>6.3</td>
<td>11.8</td>
<td>5.1</td>
<td>6.5</td>
</tr>
<tr>
<td>Fracture/joint injury</td>
<td>1.7</td>
<td>8.9</td>
<td>3.9</td>
<td>18.9</td>
<td>5.8</td>
<td>11.8</td>
<td>4.8</td>
<td>7.4</td>
</tr>
<tr>
<td>Arthritis/Rheumatism</td>
<td>2.9</td>
<td>10.2</td>
<td>4.0</td>
<td>18.1</td>
<td>4.7</td>
<td>13.4</td>
<td>5.4</td>
<td>7.9</td>
</tr>
<tr>
<td>Eye/vision problem</td>
<td>0.6</td>
<td>5.8</td>
<td>4.2</td>
<td>21.8</td>
<td>2.9</td>
<td>4.1</td>
<td>5.1</td>
<td>5.4</td>
</tr>
<tr>
<td>Hearing problem</td>
<td>0.1</td>
<td>4.2</td>
<td>2.0</td>
<td>23.9</td>
<td>2.6</td>
<td>4.1</td>
<td>3.1</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Table 4

Conceptualization Of The Interaction Model Of Client Health Behavior And The Association To Current Literature

<table>
<thead>
<tr>
<th><strong>Client Singularity</strong></th>
<th><strong>Client-Professional Interaction</strong></th>
<th><strong>Health Outcome</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Background variables</td>
<td>Pharmacological, psycho-social and education treatments recommended by provider</td>
<td>Utilization of health care services</td>
</tr>
<tr>
<td>Cognitive appraisal</td>
<td>Affective Support</td>
<td>Clinical health status indicators</td>
</tr>
<tr>
<td>Affective response</td>
<td>Health information</td>
<td>Severity of health care problem</td>
</tr>
<tr>
<td>Demographic characteristics</td>
<td>Decisional control</td>
<td>Adherence to the recommended care regimen</td>
</tr>
<tr>
<td>Social influence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous health care experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental resources</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Whittemore, 2000  
* The multiplicity of influencing factors render glycemic control for many people  
* Adjunctive peer programs for clients to share personal experiences have shown success, capitalizing on the commonalities of life experiences  
* Barriers to treatment and perceived severity of diabetes was significantly associated with glycemic control and affect self-management  
* Psychosocial, environmental barriers and perceived susceptibility to health complications are best predictors for successful self-management  
* Perceived barriers have a significant indirect effect on adherence  

Whittemore, 2000  
* Education influences behavior when it is done through an interactive approach, changing passive learning to active participation  
* Problem solving, coping skills and relapse prevention increase self-confidence  
* Self-management in conjunction with environmental support is better predictors of behavior  
* Interventions that enhance self-efficacy enhance diabetes self-management  
* Providers can influence perceptions and beliefs  

Whittemore, 2000  
* Positive outcomes are associated with diabetes education programs  
* Following treatment recommendations take time, energy and daily effort  
* Diabetes education combined with behavioral strategies has positive effect on knowledge and glycemic control  
* Empowering intervention in goal setting, problem solving, coping skills and self-motivation improve self-efficacy and decrease levels  
* Commitment to the benefit of therapies has direct effect on metabolic control  

Lustman et al., 2000  
* Medical problems are attributed to mental stress  

Lustman et al., 2000  
* Psychosomatic associations are widespread  
* Treatment of depression increases control of levels  
* There is a reciprocal interaction between depression and glycemic control  

Lustman et al., 2000  
* A total of 30 studies measured the association of depression with glycemic control  

Table 5

Conceptual Theoretical Framework And Model

Older Males With Type 2 Diabetes

Tailoring The Clients Care Is A Joint Effort

Client Singularity

Holism, uniqueness with the clients own social and physical environment.

* Background Variables
Powerful determinants of older males social network.

* Cognitive Appraisal
* Affective Response
Coping abilities and perceptions.

Professional Interaction

Quality interactive approach: The promotion of client participation in their own health care.

* Providers tailors care to the individual.
* Clients perception of psychosocial status.

* Providers elicit clients opinions, ideas and perceptions regarding their health state and offers pharmacological and psychosocial treatments.
* Clients verbalize interpretations, opinions and thinking regarding their health state.

Health Outcome

Utilization of services and clinical indicators.

* Participation in health programs to decrease disease progression, levels.

* Geriatric Depression Scale
* Demands Of Illness Inventory

* Total Scores

Source: Cox, C. (1986)
<table>
<thead>
<tr>
<th>Drug</th>
<th>Starting Dose</th>
<th>Maximum Dose</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SSRIs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sertraline HCL (Zoloft)</td>
<td>12.5 mg/day</td>
<td>50 to 75 mg/day</td>
<td>SSRI’s are first-line therapy for moderate depression in older clients; start low and slowly increase dosage.</td>
</tr>
<tr>
<td>Fluoxetine HCL (Prozac)</td>
<td>10 mg 3 times/week</td>
<td>20mg/day</td>
<td></td>
</tr>
<tr>
<td>Paroxetine HCL (Paxil)</td>
<td>5 mg/day</td>
<td>20 mg/day</td>
<td></td>
</tr>
<tr>
<td>Citalopram Hydrobromide (Celexa)</td>
<td>10 mg/day</td>
<td>20 mg to 40 mg/day</td>
<td></td>
</tr>
<tr>
<td><strong>Tricyclics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desipramine HCL (Norpramin)</td>
<td>25 mg/day</td>
<td>100 mg/day</td>
<td>Second-line therapy for moderate depression; useful for severely depressed clients when SSRI's have not provided symptom relief.</td>
</tr>
<tr>
<td>Nortriptyline HCL (Pamelor)</td>
<td>10 mg/day</td>
<td>50 mg/day</td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bupropion HCL (Wellbutrin)</td>
<td>75 mg/day</td>
<td>150 mg bid, a.m. and afternoon (300 mg/day)</td>
<td>CNS stimulant effect may be useful for depressed clients with low energy; safe in frail elderly without a history of seizures.</td>
</tr>
<tr>
<td>Mirtazapine (Remeron)</td>
<td>15 mg/day</td>
<td>45 mg/day</td>
<td>Tetracyclic compound with sedative properties; may be useful for clients with sleep problems</td>
</tr>
<tr>
<td>Nefazodone HCL (Serzone)</td>
<td>50 mg bid</td>
<td>150 mg bid (300 mg/day)</td>
<td>Useful for clients with anxious depression or trouble sleeping; fewer sexual side effects than SSRI's.</td>
</tr>
<tr>
<td>Venlafaxine HCL (Effexor)</td>
<td>25 mg bid</td>
<td>100 to 150 mg bid (200 to 300 mg/day)</td>
<td>Second-line therapy; switching clients from and SSRI to venlafaxine may recapture worn-off therapeutic effect.</td>
</tr>
</tbody>
</table>

References


http://www.diabetes.org/main/info/pre-diabetes.jsp


