

The effect of nurse-coordinated telecare intervention on depressed mood and
diabetes-related emotional stress among community-dwelling older adults
with type 2 diabetes mellitus in Southeastern Ontario

by

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ABSTRACT

The purpose of the study was to examine the effects of nurse-coordinated telephone monitoring among community-dwelling older adults with type 2 diabetes. In a randomized controlled trial 28 participants (aged 65-84yrs) with type 2 diabetes living in Southeastern Ontario were randomly assigned to an intervention group (15) and control group (13). The intervention group received weekly nurse-coordinated telephone monitoring and the control group received usual care from their family doctor. The main outcome measures were depression and diabetes-related stress as measured by the Geriatric Depression Scale (GDS) and the Problem Areas In Diabetes (PAID) questionnaire at baseline and 12-weeks. All participants completed the study. At 12 weeks, mean scores for the intervention group were significantly lower for the GDS ($p = .00$) and the PAID ($p = .03$). Participants were receptive to the intervention. Nurse telephone monitoring may decrease depressive symptoms and diabetes-related stress among community-dwelling older adults.

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CHAPTER 1

Introduction

Two and a half million Canadians are diagnosed with diabetes mellitus and that number is expected to escalate to three million by the year 2010 (Canadian Diabetes Association [CDA], 1999). Sixty thousand new cases of diabetes are diagnosed each year in Canada (Public Health Agency Canada [PHAC], 2006).

It is recognized by the Ontario Ministry of Health and Long Term Care that stress, particularly stress of managing diabetes increases the risk of high blood glucose levels and subsequent complications. Therefore, reducing stress is important for reducing the risk of complications and increasing emotional stability and well-being for people living with diabetes (Ontario Ministry of Health and Long-Term Care, Diabetes: Strategies for Prevention, 2006). The Canadian Diabetes Association (1999) confirms that feelings of anxiety and depression are common among people with diabetes and can negatively affect blood glucose values and diabetes self-management, contributing to the risk of serious complications; consequently, people with diabetes may benefit from depression screening and treatment (CDA, 1999). Hence, there is an urgent need for information concerning the scope of diabetes complications at the provincial and local level to monitor the status of regional health services and progress of the disease (PHAC, 1999).

Diabetes Mellitus is a chronic complex metabolic illness that occurs when the body does not produce enough insulin or is unable to use insulin appropriately (Murphy, Gorber & O'Dwyer, 2005). It is divided into two major classes: type 1 diabetes is juvenile onset insulin dependent diabetes, occurring in children and young adults (before age 25). Type 2 diabetes results from impaired insulin secretion. The most common age of onset for type 2 diabetes is

between 51 and 60 years of age (PHAC, 2006), however, the prevalence of Diabetes Mellitus peaks between the ages of 70 – 79 years (Ontario Health System Performance Report, 2004). Nine out of 10 people with diabetes have the type 2 diabetes. Older adults (over age 65 years) represent approximately 48% of the total number of people in Canada with type 1 and type 2 diabetes (CDA, 1999; PHAC, 2006).

Diabetes Mellitus affects one in five people aged 60 years and older (Williams et al., 2004). This number is projected to rise in Canada as the population ages, risk factors such as obesity rates increase, Canadian lifestyles become more stressful and sedentary, and improvements in diabetes medication extends the survival of people with the condition (Murphy, Gorber & O'Dwyer, 2005; PHAC, 1999). A Canadian living with diabetes is likely to be a senior (over 65 years) on a fixed income and have medical costs two to five times higher than a Canadian without diabetes (CDA, 2005).

Diabetes is the sixth leading cause of death in the world among older adults over the age of 60 years (Murphy et al., 2005). Canadian adults with diabetes are more likely to die prematurely as diabetes contributes to approximately 41,500 deaths in Canada each year. Diabetes is the leading cause of blindness, renal failure and cardiovascular disease. Approximately 80% of Canadians with diabetes will die because of diabetic complications such as cardiovascular problems or stroke (CDA, 1999; PHAC, 2006).

In Ontario, diabetes is a serious health burden. The prevalence of type 1 and type 2 diabetes for people aged over 20 years of age rose from 4.3% in 1998 to 5.1% in 2000 (National Diabetes Surveillance System, 2002). There has been a 31% increase in the number of Ontarians (all ages) with diabetes from 2002 to 2005, yet only 11% of those newly diagnosed over age 75 years were referred to a diabetes specialist (CDA, 2006).

About 705,500 people or 7.5% of the population of Ontario (all ages) are living with type 1 or type 2 diabetes. Approximately 53,000 Ontarians are diagnosed with diabetes each year, and more than one thousand Ontarians are newly diagnosed with diabetes each week (Canadian Diabetes Association Report, 2005; Ontario Ministry of Health and Long-Term Care, Healthy Ontario: Diabetes Task Force, 2004). A study by Manuel and Schultz (2004) concerning life expectancy for people with diabetes in Ontario examined the health-related quality of life and health adjusted life expectancy of people (all ages) with diabetes in Ontario. Their findings demonstrated that the impact of diabetes on quality of life and quality of life years (QALYs) was severe for older people. Life expectancy for Ontarians with diabetes was 64.7 years for men and 70.7 years for women, 12.3 years less than those without diabetes. Health-adjusted life expectancy (HALE), a measure combining morbidity and mortality associated with disease by adjusting for years lived in less than full health, is also reduced for both men and women with diabetes. The HALE for men with diabetes in Ontario is 58.3 years compared to 70 years for those without the disease, while for women in Ontario the HALE is 63.8 years for those with diabetes compared to 73.5 years for those without the disease (Manuel & Schultz, 2004).

Many older adults with diabetes in Ontario are unable to afford to manage their diabetes in a way that will prevent complications. Medication and necessary equipment (glucometers and test strips) for managing diabetes are expensive for low-income seniors (Clarke, 2006). Barriers to care in Ontario such as long wait lists for endocrinologists, fragmented access to diabetes education centres, lack of close follow-up and monitoring, and a patchwork of services for diabetes management and support contribute to the stress and burden of diabetes for the elderly (Clarke, 2006). Cost of diabetes treatment is often a

complication to treatment adherence for older people who are on a fixed income. Choosing to purchase food to eat or prescribed medication presents a dilemma for older individuals who may be too embarrassed to tell their physician they cannot afford the medication or equipment such as glucose monitoring strips, but will share this information with a nurse (O'Reilly, 2005).

An additional challenge for older people regarding diabetes care is lack of knowledge and understanding about when to take medication and why it is important to take it at the time indicated (O'Reilly, 2005). For older adults, adherence to a medication regime is not assessing whether a patient will do what is medically indicated, but more to do with having the support and provision of healthcare services and the knowledge, cognitive skills, finances and functional ability to follow recommendations (Chan, Woo, Hui, Lau, Lai & Lee, 2005; Izquierdo et al., 2003; O'Reilly, 2005).

Despite healthcare services for diabetes management, there is currently a service gap in the community care of those with diabetes whose care is predominantly medication-based, particularly for the elderly (Chan et al., 2005, Izquiero et al., 2003). This is partly due to lack of resources and in the case of older people, healthcare providers' lack of awareness of the need for a different approach in diabetes self-care management (Chan et al.; Izquierdo et al.). Innovative approaches by healthcare providers with older people need to spring from an understanding of how individuals relate to their disease. Improved emotional well-being and morale have been shown to improve mood, performance of self-care activities and diabetes outcomes (Chan et al.; Clarke, Snyder, Meek, Stutz & Parkin, 2001; Izquierdo et al.).

Findings by Finklestein et al. (2003) regarding a lack of integrated supportive healthcare services for community-dwelling older people with diabetes in North Carolina

were revealed by a retrospective analysis of 220,000 medical claims (for people over age 65) from the 1997 Medicare Standard Analytic Files. Claimants with diabetes had considerably more contact with the healthcare system and twice as many medical claims as those without diabetes. In addition, the odds of major depression were significantly higher among claimants with diabetes, as medical claim payments related to healthcare utilization were more than three times greater for older adults with both diabetes and depression than the same cohort without diabetes or depression.

In a cross-sectional analysis of 9453 community-dwelling low-income older adults with diabetes in Colorado (aged 65-75 years), McCall, Sauaia, Hamman, Reusch and Barton (2004) found that the association between inconsistent diabetes care and increased emergency health services use may be due to fragmented health care resources for elderly diabetic individuals. In addition, frequent emergency department use among older adults with diabetes (compared to older adults without diabetes) was a useful indicator of elderly individuals at risk of not receiving preventative care and support they needed to manage their disease. Furthermore, the authors reported that older adults with diabetes who were frequent emergency healthcare users were more likely to have psychosocial diagnoses such as depression, compared with non-diabetic older people.

The Canadian Diabetes Association (2006) reports that almost 25% of Canadians with diabetes have symptoms of depression, and that depression is a significant complication among people with diabetes. As well, major clinical depression has been diagnosed in as many as 15% of individuals with diabetes and is associated with poor blood glucose management, health complications and decreased quality of life (CDA, 2006; Egede, 2004; Williams et al., 2004).

Additionally, in agreement with the Canadian Diabetes Association (2006), contemporary research suggests that people with diabetes have almost double the rate of depression as those without diabetes (De Groot, Anderson, Freeland, Clouse & Lustman, 2001; Egede, 2004; Goldney, Philips, Fisher & Wilson, 2004; Larijani, Bayat, Gorgani, Bandarian, Akhondzadeh & Sadjadi, 2004; Lustman & Clouse, 2002; Williams et al., 2004).

Current research demonstrates that late-life depression is chronic and recurrent and is associated with considerable suffering and poor quality of life among older adults with diabetes (Bell, Smith, Arcury, Snively, Stafford & Quandt, 2005; Jack, Airhihenbuwa, Namageyo-Fuma, Owens & Vinicor, 2004; Larijani et al., 2004; Williams et al., 2006). However, it remains unclear how often depression is confounded by diabetes-related emotional problems and distress arising from treatment problems, food-related problems and lack of social support, which are particularly prevalent in depressed individuals with diabetes (Polonsky et al., 2005; Pouwer et al., 2005).

Healthcare providers need to be aware that the interaction of diabetes and depression adds to the complexity of care (Vincor, 2004; Williams et al., 2004). Frail elderly people are at risk of diabetes and depression occurring together and may be confused, discouraged or overwhelmed by the demands of their illness (Kinsella, 2001; Williams et al., 2004): they require ongoing support and feedback to effectively manage their health (Gambling & Long, 2006; Williams et al.).

One approach that has successfully addressed the need for augmenting health care services and health monitoring for older adults facing the challenges of diabetes management is the delivery of education and support by telephone or “telecare” (Bowles & Dansky, 2002; Gambling & Long, 2006; Mease et al., 2000; Kim, Oh & Lee, 2005; Kinsella, 2001; Vinicor,

2004; Wong, Mok, Chan & Tsang, 2005). Vinicor (2004), in a feature report for the Center for Disease Control and Prevention, identified that for people living with the daily challenges of diabetes it is necessary to find ways to enhance and extend contact with health professionals, and to expand the customary definition of the “doctor’s office” by bringing educational and health management information to the patient.

Telecare is an intervention of regular telephone monitoring of patients that improves “systems of care” where deficiencies exist (Kinsella, 2001; Vinicor, 2004; Wong et al., 2005). Telecare provides nurses with an opportunity to use their experience and expertise to deliver the best possible care for older adults (Bowles & Dansky, 2002; Kinsella, 2001).

Two randomized controlled trials to determine the effects of nurse telecare intervention among community-dwelling people (aged 18-73 years) with diabetes found that: (a) nursing telehealth care was equally as effective as in-person nursing visits, reducing diabetes-related stress and frustration and enabling patients to maintain optimal glycemetic control; (b) there was no difference in outcomes between those who received the telecare intervention and those who received a nursing visit; and (c) nurse telecare intervention was just as effective in maintaining glycemetic control and adherence to health behaviors when compared to usual physician care (Izuierdo et al., 2003; Wong et al., 2005).

Similarly, three randomized controlled trials examined the effect of nurse-led telephone care management for patients with depression (age range 19–90 years). Results showed that people who received the telecare intervention demonstrated: (a) improved depression self-care behaviors, (b) enhanced adherence to treatment regimes and medications, and (c) greater satisfaction with treatment compared to those who received

usual physician care or peer support (Hunkeler et al, 2000; Mohr et al., 2005; Simon, Ludman, Tutty, Operskalski & Von Korff, 2004).

In summary, gaps in the system of care for older adults in Ontario with diabetes need to be addressed. Problems such as depression and diabetes-related distress are well-established complications among older adults with diabetes. Nurse-directed telecare interventions may address healthcare service gaps by enhancing nursing support and communication to improve healthcare behaviors and continuity of care for community-dwelling older adults with diabetes who may be at risk for diabetes-related stress and depression.

CHAPTER 2

Literature Review

Depression and older adults

Depression is the most common psychiatric disorder in late life, yet contrary to popular belief, depression is not a normal part of aging (Kurlowicz, 1999). During the mid-1950s, there was tremendous growth in the understanding of the medical aspects of depression (Daners, 1954). The link between depression and chronic disease of the aged has been well established since that decade (Goldfarb, 1959). Over the last 50 years, a large body of research has shown that the most common factor associated with late-life depression is chronic illness (Gallo & Rabins, 1999; Lindeman et al., 2001; Sidik, Zulkefli & Mustaqim, 2003; Williams et al., 2004). Once detected, depression is easily treated and reversed. However, left undetected and untreated, depression in older people may result in physical and social impairment, delayed recovery from illness, increased health service utilization or suicide (Cole, McCusker, Elie & Dendukuri et al., 2005; Kurlowicz, 1999; Simon, Von Korff & Lin, 2005).

The prevalence of clinical depression among community-dwelling older adults in Canada is approximately 11.2% (depending on what type of instrument is used to diagnose the condition). Older women experience twice the rate of depression (14.1%) as older men (7.3%) (Canadian Mental Health Association, 2006; Newman, Bland & Orn, 1998). In Ontario, there are approximately 1.5 million people over age 65, comprising 40% of Canada's total senior (over 65 years) population. By 2028, this number is projected to double and depression among the older population will be a significant public health problem (Canadian Mental Health Association, 2006; PHAC, 2006).

Depression is a serious medical condition that affects thoughts, feelings and the ability to function in everyday life. Although therapies are available to improve and control depressive symptoms fewer than half the people with depression get the help they need (National Institute of Mental Health, 2002). Criteria for diagnosing depression are provided in the Diagnostic and Statistical Manual of Mental Disorders (4th Ed., 2000) and are summarized in Appendix A. At least five key symptoms must be present for more than two weeks to diagnose major depression. These include depressed mood, decreased interest or pleasure in activities, significant change in weight or appetite, insomnia, agitation, fatigue, difficulty concentrating, feelings of guilt or worthlessness or suicidal ideation (Williams, Clouse & Lustman, 2006). Minor depression or dysthymia involves the presence of fewer than five symptoms lasting at least two years.

Dysthymia is often clinically relevant as it can impair function and self care and interfere with quality of life (Williams, Clouse & Lustman, 2006). Chronic depression and dysthymia among older individuals are serious problems; up to 40% of older people who experience depression may suffer depressive feelings such as sadness, pessimism and hopelessness for longer than two years (National Institute of Mental Health, 2002; Williams et al., 2006).

Gallo and Rabins (1999) report that older people with depression might not exhibit typical symptoms. Late life depression is associated with multiple losses, when older adults face overwhelming fears and dependency. Physiological losses such as changes in vision, taste, hearing; altered body image and death of a spouse or loss of one's home are predictors of perceived powerlessness, depression and despair (Miller, 2000). Other factors contributing

to depression in older adults have been associated with social isolation, limited resources, poor physical health and chronic illness (Bell et al., 2005).

Older adults with depression may deny feeling sad or blue, making it important to look for other “clinical clues”. Late-life depression may present as difficulty concentrating, weight loss, irritability, worry, hopelessness and lack of interest in personal care. Older people with chronic illness and co-existing depressive symptoms may be less likely to follow medical therapy or dietary therapy guidelines, thereby increasing disease burden and distress (Gallo & Rabins, 1999).

Diabetes and depression

Evidence from prospective and cross-sectional studies demonstrates that the presence of diabetes can significantly increase the risk of co-morbid depression (Anderson, Freedland, Clouse & Lustman, 2001; De Groot et al., 2001; Egede, 2004; Williams et al., 2004). Although depression has often been overlooked in the treatment of patients with diabetes, it is now being recognized as a clinically relevant co-morbidity (Lustman & Clouse, 2005; Williams et al., 2004). Growing evidence from clinical studies indicates that people with diabetes and co-existing major depression have poor glycemic control and are at risk for further complications of their illness such as foot ulcers, retinopathy, neuropathy and functional disability (Anderson et al., 2001; Egede, 2004; Lustman & Clouse, 2005; Katon et al., 2004). However, the mechanism of the relationship between diabetes and depression is not fully understood. It has been suggested that the association could be related to depression-induced neuroendocrine abnormalities or simply decreased self-care behaviors (Black, Markides & Ray, 2003; Lin et al., 2004; Williams et al.).

Three short-duration (10 weeks to six months) randomized clinical trials have examined the effects of various depression treatments among mixed-age patients with co-existing depression and diabetes. All showed positive effects on depressive symptoms, but diabetes outcomes varied. In a study of 51 mixed-age participants with poorly controlled type 2 diabetes and major clinical depression, cognitive behavioral therapy for depression plus diabetes education improved depressive symptoms and blood glucose values compared with diabetes education alone, which had no effect on blood glucose levels (Lustman, Griffith, Freedland, Kissel & Clouse, 1998). In two similar controlled trials (28 and 60 mixed aged participants respectively), there was no effect on glycemic control or blood glucose monitoring for patients taking antidepressant medication compared to those taking a placebo. Conversely, the antidepressant medication, nortriptyline, had a negative effect on blood glucose levels (Lustman, et al., 1997; Lustman, Freedland, Griffith & Clouse, 2000). These research findings raise the arguments that: (a) treatment for depression alone does not improve overall health outcomes among people with diabetes and depression, and (b) optimal healthcare approaches for people with diabetes who suffer from depression need to be explored.

In support of this argument, several recent research studies of mixed-aged participants found that depression among people with diabetes is also associated with clinical and behavioral factors, not only glycemic control, and is more complicated and difficult to treat than depression among people without diabetes. Factors such as poor adherence to dietary recommendations, medication dependence, the presence of other chronic conditions, lifestyle factors (smoking, obesity and inactivity), and the psychosocial burden and distress of diabetes management contribute to the complexity of diagnosis and treatment of depression

(Anderson et al., 2001; Egede, 2004; Egede & Zheng, 2003; Engum, Mykletun, Midthjell, Holen & Dahl, 2005; Ciechanowski, Katon & Russo, 2000; Katon et al., 2004; Lin et al., 2004).

From a population survey of 4463 community-dwelling adults (over 18 years) with diabetes, Lin et al. (2004) found that major clinical depression was mainly associated with patient-initiated behaviors that were difficult to sustain, such as exercise, diet and medication adherence. In addition, health maintenance and self-care was sub-optimal for home-based activities such as healthy eating and regular exercise. Non-adherence to oral hypoglycemic medications was significant for people with major depression (neglecting to take oral diabetes medications to maintain blood glucose values at least 20 times a year). Overall, clinically diagnosed major depression was present in 12% of participants and was more prevalent in women with diabetes (14.4%) than in men (9.8%).

Diabetes and depression in older adults

In the past five years, various population-based studies among community-dwelling older adults (over age 65) have suggested that there are two distinct pathways by which depression affects diabetes management in older adults: physiological and psycho-behavioral pathways. Moreover, depression may influence diabetes management and self-care because of decreased motivation that increases the risk of negative behaviors and complications, thereby affecting metabolic control (Black, Markides & Ray, 2003; Chin, Polonsky, Thomas & Nerney, 2000; Williams et al., 2004).

Extensive literature has been published describing the interaction of type 2 diabetes and depression. In a randomized controlled trial in Albuquerque, of over 800 Hispanic and non-Hispanic individuals aged over 65 years with and without type 2 diabetes, Lindeman et

al. (2001) measured depression by self-report history and by using the Geriatric Depression Scale (15-item GDS). Results showed that Hispanic men and non-Hispanic women with type 2 diabetes had significantly higher GDS scores (six or greater indicating depression) than those without diabetes; and self-reported depression correlated positively with the high GDS scores.

Two studies found that the interaction between diabetes and depression may have a synergistic or enhanced effect on adverse health outcomes in older people. Black et al. (2003) provided a gradient response to show that the risk of adverse outcomes such as functional disability and death increases with the severity of depression among older adults with diabetes. Similarly, Chin et al. (2000) found that older adults who were more depressed were ambivalent about their diabetes treatment. Uncertainty regarding the effect of diabetes in their lives negatively influenced motivation, coping mechanisms, self-care and how aggressive they wished their treatment to be.

Collectively, three population studies and one randomized controlled trial suggested that depression is a modifiable complication among older adults with diabetes. However, it was identified that specific risk factors for older adults with diabetes such as lower levels of education and socioeconomic status, living alone and the presence of three or more co-morbid conditions (such as cardiovascular, respiratory conditions or arthritis) increase the possibility of depression and poor outcomes (Bell et al., 2005; Black, 1999; Niefeld et al., 2003; Williams, et al, 2004). Bell et al., in a study of community and rural-dwelling older adults with diabetes and depression found that treatment plans, self-care and diabetes-related stress were influenced by income, transportation and beliefs and value systems of “making do”. Asking for assistance was a sign of “weakness”. Stress and fear of the stigma and

discrimination of mental illness also prevented older people asking for help when they needed it.

Enhancing not only depression care but also social support and problem-solving to relieve stress may be a way to encourage positive health outcomes for older adults with diabetes (Black et al., 2003; Chin et al., 2000; & Williams et al., 2004). It is important to individualize the treatment approach for older adults and include the patient as a “partner” in the therapeutic approach (Chin et al., 2000). Furthermore, older adults with diabetes should be viewed within a wider geriatrics framework that optimizes overall functional status, client-centered care and quality of life and enables older people to incorporate diabetes management into their lives. The geriatric perspective has largely been missing from most national diabetes guidelines (Black et al., 2003; Chin et al., 2000; Meneilly & Tessier, 2001).

Diabetes and stress

Over forty years ago, Mitchell and Goldfarb (1965) examined the psychological needs of people over age 65 years with chronic illness (cardiovascular, cancer and respiratory illness) living at home in New York City. A face-to-face interview consisting of 58 questions gathered information about the emotional problems of older, ill persons, and responses were analyzed into in themes. Twenty of the 78 respondents asked for help with emotional distress (self-reported depression, crying, weeping, loneliness, worry, irritability) and over half of the participants felt they were being demanding by asking for help or information about their condition or their illness. The authors suggested that individual consultation and care was necessary to understand the characteristics and emotional problems faced by these participants.

Thirty-five years later, in a feature report addressing emotional distress in the chronic illness of diabetes, Polonsky (2000) indicated that diabetes-specific stress is associated with an individual's perception of how the disease affects his or her physical, psychological and social functioning. The author suggested that a client-centered approach might be a way of viewing the personal side of diabetes and how the perceived stress of coping with diabetes impedes an optimum lifestyle, especially when the disease does not seem to respond to a person's best efforts to manage it.

Four population studies among mixed-aged individuals with diabetes from Croatia, Holland, Britain, Norway and the United States demonstrated consistent findings that higher levels of depression resulted in increased levels of diabetes-related stress, and that stress itself can be a burden (Clark et al., 2001; Engum et al., 2005; Pouwer et al., 2005; Snoek, Pouwer, Welch & Polonsky, 2000).

Snoek, et al. (2000) examined diabetes-related stress among more than 2,000 American and Dutch mixed-age individuals; they found when comparing Problem Areas In Diabetes (PAID) scores across American and Dutch patients with diabetes that similar problems appeared. Negative emotions and stress were associated with treatment plans, food-related problems and lack of social support. Feeling "down" and emotional distress were common in relation to daily diabetes management. Emotional problems such as coping with daily regimens, worrying about future disease complications, feelings of anxiety and guilt when "off track" with diabetes management and not knowing if depressed mood and feelings were related to blood glucose complications were common. In a 12-month prospective trial, Clark et al. (2001) found that nurses were able to effectively use the PAID questionnaire to assess diabetes-related stress among older adults (average age 64.4 years) who were

managing their diabetes in the community. During a telephone assessment, nurses were able to identify individuals experiencing anxiety and stress with medications and with blood glucose values. Abnormally high PAID scores (over 50) were used to identify individuals for referral to a clinical psychologist. This study found that psychosocial and emotional support were linked to performance of diabetes self-care and 95.8% of patients managed a prescribed change in therapy via a telephone call when emotional stress was addressed.

Black, Markides and Ray (2003) described comparable findings in a longitudinal study of 2,383 Mexican-Americans aged 65 years and older. The interaction of diabetes and depressive symptoms was found to influence lifestyle (disability and activities of daily living) and social functioning. Feelings of stress and anxiety were strongly associated with increased depression and lack of social support and the enduring fear of continued progression of diabetes despite their utmost efforts to adhere to treatment plans.

In a qualitative study exploring misunderstandings about type 2 diabetes among 18 community-dwelling individuals in Sweden (average age 64.5 years), Holmstrom and Rosenqvist (2005) found common themes emerged from the analysis: (a) type 2 diabetes is not “real diabetes”, (b) fear of complications, especially foot and eye complications, induced visions of horror, (c) self-monitoring of blood glucose and medications is routine and not a learning tool to guide diet and medication regimes, (d) reducing fat in the diet is important and (e) physical exercise is good. These beliefs led to confusion, stress and misunderstandings about their illness. Performing blood glucose monitoring made people nervous and they feared taking insulin injections. Several people stated that that they regulated their blood glucose levels by eating more or less than usual to avoid hypoglycemia because the blood glucose values “had a life of their own” as they were unable to “predict”

the value that would show up on the monitor. Some people felt the “random values” on the glucose monitor had nothing to do with “real life” or managing their diet or illness. The authors concluded that getting the right support at the right time is important for older adults trying to manage stress, to feel encouraged and be motivated to understand and manage their illness.

Depression, stress, social support and quality of life among older adults with diabetes

A number of studies have indicated an association between the chronic illness of diabetes and depression (Anderson, Freedland, Clouse & Lustman, 2001; Goldney, Fisher, Phillips & Wilson, 2004; Katon et al., 2004; Mann, Blanchard & Waterreus, 1993). Several hypotheses have been raised to explain this association. Eaton et al. (1996) and Kawakami et al. (1999) suggested that depression may in fact predict the onset of diabetes. In agreement with these findings, Treif et al. (2003) and Kawakami et al. (1999) suggest that psychological distress coupled with depressive symptoms are known to trigger a greater release of cortisol (a hormone released in response to stress) and counter-regulatory hormones, resulting in increased blood glucose and glucose intolerance, hence a much greater risk of developing diabetes.

Despite this evidence, there is a large body of literature suggesting that the burden of coping with diabetes has a powerful impact on mood and stress and can compromise psychological function (Polonsky, 2000) especially for older adults adhering to the demands of diabetes management while knowing that eventual onset of complications is almost inevitable (Thomas, Scarinci, Jones & Brantley, 2003). When diabetes becomes “real” such as when insulin is first started it can be a continual distressing struggle to find a way to

integrate treatment plans and self-management into one's life while facing a sense of mortality and uncertainty that diabetes may bring (Polonsky, 2000).

Many older adults need support "accepting" insulin treatment as the next step in the progression of their disease. Additionally, due to the complex and progressive nature of diabetes, numerous comorbidities including hyperlipidemia, hypertension, obesity and depression, are predictable. Avoiding these diabetes-related complications as the disease progresses is a practical and worrying challenge that older adults confront daily. Emotional support is vital to help older individuals understand this is not a personal failure but the reality of diabetes and is not their fault. Effective communication between an individual, family and the healthcare provider is crucial at this time if older adults are to be expected to integrate detailed and complex treatment plans into their daily lives (Childs, Cypress & Spollett 2005).

Confronting a disease every day that is difficult to manage plus coping with losses in late life is stressful and may severely compromise mood and well being, particularly in the absence of family and social support (Cheng & Body, 2000; Karlsen et al., 2004). Family and healthcare provider support has been recognized in the literature as crucial for older adults with diabetes to support and enhance decision-making and augment daily self-care. When older individuals are required to change their behaviors to regulate metabolic processes that are normally automatic such as learning to adjust their blood glucose levels, social support from family and friends have been shown to benefit disease management and personal adjustment to chronic ill health (Fisher et al., 2006; Karlsen et al.; Trief et al., 1998).

However, there is evidence in the literature that social relationships are not necessarily supportive and can sometimes become a stressor themselves (De Ridder &

Schreurs, 1996; Karlsen et al., 2004). Non-supportive relationships can produce nagging and criticism from friends and family. Consequently, this may reduce an older person's perception of autonomy and make him or her feel less motivated to cope with disease management. This in turn may result in older individuals responding to disease-related problems with denial and avoidance (Karlsen et al.).

Karlsen et al. (2004) and Trief et al. (2003) found that the perception of family support was significantly associated with diabetes-related coping. In both studies, older respondents who reported more supportive family relationships also reported they used problem-focused coping styles and not reactive or emotional-focused coping. These findings are consistent with previous studies that suggest positive family support may lead individuals with diabetes to more actively plan and structure their treatment regimes and therefore seek education and knowledge that they require and assistance when needed (Karlsen et al., Pierce et al., 1991; Trief et al., 1998; Wandell & Tovi, 2000).

There is a growing recognition that living with diabetes and the resulting disruption in health is a continual source of stress for older adults (Maes et al., 1996; Treif et al., 1998; Karlsen, Idsoe, Hanestad, Murberg & Bru, 2004). Additionally, everyday stressors such as loneliness, non-supportive family behavior or physical symptoms such as pain must be managed if older people with diabetes are to adjust to their disease (Karlsen et al.; Polonsky 2000). Living with diabetes can be taxing. Facing a complex and confusing set of self-care directives is challenging and often discouraging for older adults, requiring frequent consultations with healthcare providers for ongoing education and support. Elderly people may then become frustrated and confused when complex medical regimes or physical restrictions of diabetes limit the ability to function in their roles. Because of compromised

quality of life or pessimism due to physical or social and emotional stress, diabetes-related conflicts with family members and healthcare providers may become strained over time and can be viewed as “non-compliance with treatment plans” (Huang, Gorowata-Bhat & Chin, 2005; Polonsky, 2000; Talbot & Nouwen, 2000).

If diabetes is not effectively managed, older people may need to limit their activities. Thus, quality of life is affected and the resulting loss of independence has been recognized to increase stress and depressive symptoms (Lin, Katon, Von Korff, & Rutter et al., 2004; Huang, Gorawara-Bhat, & Chin, 2005; Egede & Zheng, 2003). Perceived losses such as losing one’s driving license because of frequent or severe hypoglycemic episodes or avoiding social outings to prevent dietary lapses can compromise well-being and increase emotional distress (Huang et al., 2005; Polonsky, 2000). Egede & Zheng (2003) indicated that numerous psychosocial factors increase the risk of emotional distress and depression among older people with diabetes, especially living alone, lack of social support, lower socioeconomic status, perceived lack of control and illness intrusiveness.

Collectively, chronic illness, depressive symptoms, lack of social support and disability contribute to emotional stress and poor prognostic outcomes in older individuals, often disproportionate to the severity of medical conditions (Banerjee et al., 1996; Gallo & Rabins, 1999). However, in contrast to older adult’s functional needs the emotional consequences of chronic illness and disability are often not recognized (Franks & Lichtenberg, 2003), yet anxiety and depression are profoundly influenced by an older person’s concurrent physical health and the social circumstances in which they live (Mann, Blanchard & Waterreus, 1993; Trief et al., 1998). Emotional stress and depression consequently become the best predictors of hospitalization in elderly diabetic adults;

therefore, specific attention to emotional stress and depression management in diabetes is critical in the treatment of elderly individuals (Lustman & Clouse, 2002).

Several studies have found that depression in diabetes diminishes quality of life (Araki & Ito, 2003; Kaholokula, Haynes, Grandinetti & Chang, 2006; Trief et al., 2003). Furthermore, Brown et al. (2004) found that in terms of quality of life, a noteworthy number of individuals with diabetes were willing to trade a significant proportion of their remaining life in return for a shorter life without diabetes. Goldney et al. (2004) state that understanding which dimensions of quality of life are associated with diabetes and depression is important for the day-to-day management of the diabetic population.

From the perspective of dimensions of quality of life, Trief et al. (2003) compared health related quality of life among older adults (over 60 years of age) and younger (30-59 years) insulin-treated adults with diabetes. Findings showed that people in the 60-74 year age group with type 2 diabetes reported significantly poorer physical function, less vitality and more role limitations due to emotional problems than middle-aged adults with insulin treated diabetes. The authors suggested that maximizing coping skills and social resources might help older adults cope with the many lifestyle changes and difficult demands of diabetes. Thus, Treif et al. generated the hypothesis that interventions for older adults with diabetes should be focused on individual adaptation to illness designed to build on strengths and prevent high levels of anxiety and distress that often accompany the burden of diabetes self-management.

Regarding self-care, diabetes management is multi-dimensional (checking one's feet, adhering to diet requirements and monitoring blood glucose values) and may vary over time in response to changing personal and environmental conditions (Goldney, Fisher, Philips &

Wilson, 2004; Toobert, Hampson & Glasgow, 2000). People with diabetes must learn to evaluate themselves, decide what actions to take to meet their needs and perform these actions (Sousa & Zauszniewski, 2001). Qualitative studies have found that the general healthcare goals of older adults are defined in ways that integrate physical, mental, spiritual and social aspects of their lives (Chin, Polonsky & Thomas et al., 2000; Arcury, Quandt & Bell, 2001). Accordingly, it is important to define how older people shape their health care goals and to what extent their goals relate to self-care behaviors (Huang, Gorawata-Bhat & Chin, 2005). Therefore, numerous benefits may be gained from understanding psychological stress and quality of life among older people with diabetes in order to individualize their care and support management of their illness (Toobert et al.).

Theoretical Framework – The Theory of Human Caring

The conceptual framework to guide the study was the Theory of Human Caring by Dr. Jean Watson (2005). Fundamental principles of the Theory of Human Caring are: (a) the person is valued, nurtured, understood and assisted to improving health and well-being, (b) the caring environment encourages and promotes positive health outcomes, (c) health promotion is concerned with complete physical and social well-being and functioning, and (d) nursing promotes and restores health within a holistic nursing framework (Watson, 2005). A holistic nursing framework encompasses the concept of healing the whole person, focusing on the client's beliefs and values and physical and psychological wellness (Eliopoulos, 2004; Watson 2005).

The focus of the Theory of Human Caring reflects how the nurse and client interact throughout a shared relationship. Within the mutual relationship, the nurse must develop “sensitivity to self and others” by clarifying his or her own beliefs and values (such as

racism, sexism, ageism) that may pose a barrier to caring. By understanding self, the nurse can be authentically present with clients. By being present with the client, the nurse can explore the meaning and experience of illness and health for each individual client, creating an “actual caring occasion”. In a caring occasion or caring moment, both nurse and client explore the client’s lived experience, beliefs, values, and expression of feelings. The nurse and client relationship itself then becomes the agent of change, involving choice and action by both nurse and client, allowing healing to occur (Falk-Raphael, 2000; Mullaney, 2000; Watson, 1988).

Previous research has confirmed that Watson’s theory of human caring serves as a framework for teaching and learning and as a therapeutic nursing intervention. As early as 1989, Benner reported that the “cancer-prone personality” with symptoms resembling clinical depression and disease-related stress responded well to nursing caring (Benner & Wrubel, 1989). Later, Perry (1997) found a direct relationship to between Watson’s theory of nursing and the beliefs of exemplary oncology nurses.

Three qualitative studies and one descriptive study concerning adults with chronic illness (sickle cell anemia, asthma, depression and cystic fibrosis) have successfully utilized the Theory of Human Caring as a conceptual framework. Watson’s Theory of Caring linked research, theory, outcomes and practice by showing that clients (and their families) were more open to participating in treatment goals. Nurse and client “human care transactions” (caring occasions) created opportunities for the client’s active participation. Moreover, the studies demonstrated that the theory of Human Caring is a culturally congruent approach to client care, as nurses and clients explored the personal meaning of illness and how this influenced individual healthcare management and “ownership” of disease (Dorsey, Philips, &

Williams, 2001; McClelland, 1997; Mullaney, 2000; Tracy, 1996). This reflective approach facilitated communication and expression of feelings and helped clients articulate realistic health goals, facilitating their role as a “partner” in their plan of care, encouraging motivation and goal attainment.

From another perspective, Falk Raphael (2000) reported that although Watson’s philosophy, science and theory of Human Caring focuses attention on the relationship between the nurse and client, it can be expanded to include person and community. Interpersonal and interactive teaching and learning is an important part of health education in which community health nurses are engaged. Promotion of the client’s self-responsibility and development of personal skills and use of community resources for support are central to Watson’s “human needs assistance and caring ” factor.

For community-dwelling adults, according to McCormack, (2004) Watson’s “person-centered caring occasion” transcends particular nursing specialties. However, the key to successful outcomes in caring for older people is reflected in the underpinnings of Watson’s philosophy. The importance of relationships in caring for older people is knowing an older person in their social context, to include their beliefs and values and formal and informal carers. Relationships and caring occasions created in this way sustain communication and enhance a relationship that is nurturing for both nurse and client.

Being in tune with the patient’s perspective of how diabetes has influenced his or her life is important in establishing a caring relationship. Caring philosophy can enlighten the nurse’s approach to patient encounters and the interpretation of cultural, environmental, social and emotional context that influence a client’s health, thereby constructing a creative caring occasion for each unique individual (Hagedorn, 2005).

Bowles and Dansky (2002) conducted focus groups after a trial of nurse telecare interventions for community dwelling older adults with diabetes. Analysis of data from the focus groups showed the most significant benefit for nurses and clients was that telecare added a new dimension of communication and caring to the traditional “nurse-patient relationship”. The telecare intervention added a new perspective of continuing nursing care, increasing patient rapport and partnership. Nurses felt that patients were able to better manage their illness because of the continued advice and support, especially isolated individuals who benefited from the enhanced communication.

As evidenced from the synthesis of the literature, Watson’s Theory of Human Caring is congruent with the aim of the proposed study and was the theoretical framework to demonstrate the effect of a 12-week nurse telecare monitoring intervention on depressive mood and diabetes-specific stress among community-dwelling older people with the chronic illness of diabetes.

Telecare

Patient telephone monitoring interventions by nurses have been described in the literature by a variety of names. The terms telemedicine, telehomecare, telehealthcare, and telecare are commonly used in research articles and the terms appear to be interchangeable. With the progression of technology new telecare interventions now involve a combination of audio, video and data transmission through videophones and telemedicine technology linking patients with healthcare providers (Buckley, Tran & Prandoni, 2004).

The key objectives of telecare according to Bowles and Dansky (2002) are to: (a) enhance client knowledge and understanding, (b) develop meaningful interactions and communication between nurse and client, (c) provide support, especially to isolated and

housebound individuals, (d) assess and support the client's health beliefs and attitudes, and (e) monitor risk factors and treatment plans.

Current studies have proposed that nurse-delivered telecare has the potential to assist people with diabetes manage their disease, thereby reducing stress (Durso et al., 2003; Clark et al., 2001; Izquierdo et al., 2003). Innovative methods of healthcare delivery must be explored, as traditional healthcare delivery, such as a brief office visit to a family physician is often both inadequate and ineffective in terms of long-term management for older adults with diabetes (Durso et al.; Williams et al., 2004). Short visits to the doctor separated by long intervals do not provide suitable opportunities for healthcare professionals to listen, monitor and give feedback about diabetes management and its related physical and psychological complications (Durso et al.). Furthermore, fragmented diabetes education without follow-up may not motivate and maintain self-care behaviors to prevent disease complications. Nurse-initiated telephone monitoring that extends patient contact with health providers may improve health outcomes and motivate and support individuals; thereby reducing the stress and challenges of daily health management for older people with diabetes (Durso et al.; Williams et al.).

A number of studies propose that as diabetes care recommendations for older people become more complex and people are living longer with diabetes healthcare providers need to extend contacts with community-dwelling adults by means of telephone monitoring. This method of monitoring enables healthcare providers to explore patients' specific circumstances to prompt self-care behaviors, monitor disease and improve health outcomes in the home environment (Bowles & Dansky, 2002; Durso et al., 2003; Huang, Gorawara-Bhat & Chin, 2005; Izquierdo et al., 2003; Williams et al., 2006).

Two randomized controlled trials (over 3 and 12 months) examined the effect of nurse telecare interventions (compared to routine physician care and education only) on self-management (glycemic control, diet and medication adherence) among mixed age (average 57.3 years) community-dwelling individuals with diabetes (Polonsky et al., 2003; Wong, Mok, Chan & Tsang, 2005). Participants in the intervention groups received weekly or bi-weekly telephone calls from nurses. Utilizing an individualized approach, care plans were developed and monitored by telephone according to the client's lifestyles, motivation, knowledge and social background. Outcomes showed that by integrating support and feedback into real-life environments participants were encouraged to manage their disease more effectively, reporting more confidence and frequency in blood glucose monitoring and medication adherence. Participants focused attention on carbohydrate and fat content in their diet when compared to those receiving usual care (by a physician or education only) that did not adhere to dietary recommendations (Polonsky et al., 2003; Wong, Mok, Chan & Tsang, 2005).

In a randomized controlled trial Piette, Weinberger, Kraemer and McPhee (2001) examined the effect of weekly automated and personal telephone calls (five to eight minutes in length) to follow-up on diabetes treatment among community-dwelling American veterans aged 65 and older with type 2 diabetes compared to usual follow-up care with a physician. After one year, the intervention group receiving nurse telecare monitoring showed improvement in self-care (glucose monitoring and medication adherence), increased visits to podiatry clinics, improved glycemic control and decreased anxiety and symptom burden. These results were achieved with an average of six minutes per month nurse-patient personal contact by telephone. Twenty-five percent of all telephone calls addressed depression and

anxiety. Adherence problems with diabetic medication and diet were discussed 66% of the time, glucose self-monitoring 60%, and non-diabetes medications 32% of the time. Seventy-nine percent of intervention patients reported they were very satisfied with monitoring.

Similarly, in a 12 month pilot study to determine the effects of nurse monitoring of older American adults (average age 78.43 years) with type 2 diabetes using Motorola cellular telephones for follow-up surveillance, Durso et al. (2003) found that weekly telephone interaction with a nurse prompted motivation. Participants gained confidence in glucose monitoring, managed detailed medication adjustments and increased foot inspections. Some telephone calls lasted an hour and although all participants were very satisfied with the interactive care and appreciated the reminders, prompts and feedback, they recommended shorter, more frequent calls.

Gambling and Long (2006) found that 15 British participants (of mixed age) who received nurse telecare monitoring for diabetes care reported that “nurse-helping relationships” supported them with their diabetes management. The authors collected data from two groups of participants, an intervention group receiving nurse telecare monitoring and a control group receiving usual physician care. Results showed that the telecare intervention acted as an enabler for movement through stages of change. Participants in the intervention group demonstrated improved glycemic control and reductions in alcohol consumption, smoking, psychological stress and weight gain. Weekly calls to participants identified “good controllers” and “poor controllers”. Those in the “good” group moved to “self-liberation” quickly, feeling that they were in control. “Poor controllers” required more frequent contacts aimed at consistent support and advice and they formed a much stronger bond with the telecare nurse than the “good controllers” did.

Pilot studies in the United States and China to develop telecare programs specifically for older community-dwelling adults with diabetes found that nursing care delivered by telephone not only reduced unplanned hospitalizations and emergency care, it added a new dimension of human interaction and communication to the delivery of healthcare. Enhanced communication also strengthened the nurse and client relationship, building a partnership to work towards goal attainment (Bowles & Dansky, 2002; Chan et al., 2005; Walsh & Coleman, 2005).

In brief, the literature shows that enhanced care and support by telephone for older adults with diabetes has a positive effect on mood, stress, morale and performance of diabetes management.

Rationale for the study

Gaps in the system of care for older adults in Ontario with diabetes need to be addressed. Problems such as depression and diabetes-related distress are well-established complications among older adults with diabetes. Nurse-directed telecare interventions may address healthcare service gaps by enhancing nursing support and communication to improve health outcomes and continuity of care for community-dwelling older adults with diabetes in Southeastern Ontario who may be at risk for diabetes-related stress and depression.

Purpose

The purpose for this study was to determine if enhanced communication, care and support by telephone has a positive effect on depression and stress among community-dwelling older adults with type 2 diabetes.

Research Questions

1. What are the effects of a nurse telecare intervention on depression and diabetes-related stress among community-dwelling older adults with type 2 diabetes in Southeastern Ontario?
2. What are the perceptions of study participants of home telecare monitoring by a nurse?
3. How do community-dwelling older adults describe their experience with diabetes management?
4. Is telecare useful for older adults to be able to communicate with a nurse?

CHAPTER 3

Methods

The experimental design was a 12-week randomized controlled trial (Appendix B), to examine the effect of a nurse-directed telecare intervention. Posters inviting people to participate in the study were placed in the Amputee, Geriatric Medicine, Neuro-Muscular, Stroke and Muscular-skeletal rehabilitation clinics and Day Hospital waiting rooms at Providence Care, St Mary's of the Lake Hospital. The researcher screened participants for eligibility. Twenty-eight individuals who met eligibility criteria volunteered and consented to take part in the study (Appendix C). Participants volunteered for the study at their clinic appointment or telephoned the research nurse at a later date to volunteer. Some participants volunteered for the study up to six weeks after their clinic appointment.

A recruitment nurse (blind to the study design) was trained by the study author to interview participants face-to-face either at Providence Care or in their homes to collect demographic data (provided by the demographic data outline in Appendix D) and to administer the GDS (Appendix E). Each participant then completed the self-administered PAID questionnaire (Appendix F).

Finally, participants were randomized to either: (a) Group 1, the experimental group receiving the telecare intervention or (b) Group 2, the control group receiving usual care of a family physician, as follows. A computer generated random number table was used to number envelopes and participants randomly picked a sealed envelope. Information in the sealed envelope notified participants to which group they were assigned. Each participant randomized to the intervention group received weekly telephone calls from the study author

for 12-weeks, to ask each participant questions about their health (Appendix H). The usual care group received usual routine care from their family doctor.

After the 12-week intervention (at Time 2), the blinded recruitment nurse interviewed participants face-to-face in their homes to complete the final GDS questionnaire and participants completed the final self-administered PAID questionnaire. Demographic data were not updated at Time 2.

Within a week of the final GDS and PAID questionnaires being completed, the researcher contacted each intervention group participant by telephone and asked each participant four open-ended questions about their experience with the telecare intervention (Appendix I). Responses to the four questions as well as the weekly telephone questions were recorded as written field notes and organized into themes and topics for analysis. The four questions were developed from a synthesis of the literature regarding participants opinions about a telephone intervention to support their diabetes care at home (Bowles & Dansky, 2002; Kim, Oh & Lee, 2005; Piette et al., 2001; Durso, et al., 2003).

Sample and setting

Sample size was calculated by using Cohen's method (1987). To have 80% power to detect a 0.70 effect size and an alpha of 0.05, the number of participants required would be 26 per group (30 per group to allow for a 15% dropout rate) Hazard-Munro, (2005). Similarly, Kim, Oh and Lee (2005) based their sample calculation for a randomized pretest – posttest experimental design (to assess the effectiveness of a nurse-coordinated telephone intervention on blood glucose values) on a similar study by Piette et al., (2001). For an effect size of 0.70 at a power of 80% and an alpha of 0.05, thirty subjects per group were required to detect a significant effect of a 1% reduction in blood glucose levels at posttest compared to

pretest. Kim, Oh and Lee recruited 35 participants, twenty participants were randomized to the intervention group and 15 participants were randomized to the control group.

Recruiting for this study was challenging. Participants who did volunteer were cautious about calling an unknown telephone number to volunteer for the study. Twenty-eight eligible individuals volunteered for the study and were randomized from September 2006 to January 2007. After January 7, 2007, there were no other volunteers for the study. Because of time restraints (a 12-week recruitment period) it was decided to follow only one method of recruitment and not to actively recruit more volunteers. Of the 28 individuals who volunteered, no individuals declined to participate. Participants who volunteered were from outpatient clinics and the Day Hospital at Providence Care. All participants were living at home in Southeastern Ontario. Fifteen participants were randomized to Group 1 receiving the telecare intervention and 13 participants were randomized to Group 2 the usual care group.

Inclusion criteria were: (a) aged 65 years and older, (b) diagnosis of type 2 diabetes, (c) able to understand English, (d) be available by telephone for telecare for 12 weeks, and (e) able to perform blood glucose self-testing to inform the nurse about their blood glucose levels. Exclusion criteria: (a) a definitive diagnosis of dementia or non-depressive psychiatric illness (such as psychosis or schizophrenia), which may preclude accurate screening for depressed mood.

Description of the intervention

The telecare intervention was a weekly telephone call for 12 weeks administered by the study author (the nurse conducting the research at Queen's University). This research nurse was an advanced practice nurse in Specialized Geriatric Services with a certification in gerontology and diabetes education.

The College of Nurses of Ontario standards of practice were used as a guide for the telecare intervention (College of Nurses of Ontario, 2005). With the development of new telecommunication techniques to provide consultation and nursing care, nurses must continue to meet the College of Nurses of Ontario (CNO) standards of practice for the delivery of healthcare and information by telepractice methods of communication. According to the CNO, the term telepractice includes health care delivery by telephone, personal digital assistants (PDAs), faxes, audio and video conferencing, the Internet and any computer information systems and teleradiology and telerobotics.

The CNO describes principles of nursing telepractice to delineate nurses' accountabilities when using telepractice and for use as a guide to individual practice. When a nurse provides care to a client using telecommunication, a therapeutic nurse-client relationship is formed based on trust and respect. The College of Nurses standards of practice emphasize that client's needs in telepractice healthcare delivery must always be considered a priority.

Weekly telephone calls by the research nurse to the participants in the intervention group were approximately 25 minutes long. During the telephone intervention the researcher asked questions (Appendix H) to assess an individual's mood and concerns about diabetes management and documented the client's experiences and responses to the questions to examine themes at the completion of the study. The 12-week intervention consisted of support and feedback to participants about their mood and the importance of maintaining blood glucose levels within a near-normal range, continuous education and reinforcement of diet, food choices, exercise, self-management skills, medications, and regular self-monitoring

of blood glucose levels. The intervention group was asked to record self-monitored daily fasting blood glucose levels.

When the researcher discussed weekly questions, she was also able to listen to feedback from participants and note problems such as (a) communication or cultural barriers to care, (b) emotional and verbal client cues to assist in support and decision-making, and (c) use a caring systematic approach to build and sustain a trusting relationship. The role of the researcher in this study was not to direct or provide care, but if it was recognized a participant might be at risk, each participant was asked to contact his or her family doctor. In accordance with the CNO telepractice for documenting telephone interactions, the research nurse documented the weekly nurse-client communications. Consent, confidentiality and privacy concerns regarding personal health information were respected according to the CNO standards.

Participants assigned to the control group resumed the same pattern of family physician follow-up visits that was normal for that individual. Data were not gathered regarding how many times participants in the usual care group visited their family doctor.

Field Notes

Field notes are an account of things the researcher “sees, hears, experiences or thinks” (Morse & Field, 1995, p. 112). During this study, field notes were taken to supplement other data gathering to enhance the researcher’s understanding of events. The researcher took field notes during each telephone contact with the participants and for the responses to the four open-ended questions at the end of the study.

Instruments

Geriatric Depression Scale

The first instrument to measure depression in older adults, the Geriatric Depression Scale (GDS), was created in 1983 by Yesavage, Brink, Rose, Lum, Huang, Adey and Leirer (Appendix E). It has been tested and used extensively with the older population in many countries and translated into many languages (Garrard et al., 1998; Whooley, Stone & Soghikian, 2000).

The target population for the GDS is healthy or medically ill and mild to moderately cognitively impaired older adults. It has been used in research among older adults in community, acute and long-term care settings (Garrard, 1998; Kurlowicz, 1999; Whooley, Stone & Soghikian, 2000). In the United Kingdom, the GDS has been endorsed as the appropriate instrument to screen for depression during statutory health checks by visiting nurses among community-dwelling elderly patients in Britain (Katona, 1994; Snowdon & Lane, 1999).

In a cross-sectional study of 105 adults aged 65 and over, Heisel et al. (2005) found that GDS scores were positively associated with self-report and clinician-administered measures of suicidal ideation. In the long version of the GDS, 15 of the 30 GDS items distinguished groups high or low in self-reported suicidal ideation. The same result was true for six of the 15 items in the short version of the GDS. The authors concluded that both the long and short forms of the GDS might be used to screen older adults for potential suicide as well as depression. Five internally consistent GDS items were identified that were highly associated with suicidal ideation, hopelessness, worthlessness, emptiness, absence of happiness and absence of the perception that it is “wonderful to be alive”.

Although the GDS is targeted for use with older individuals, it is not used exclusively in research studies among older adults. Two screening tools, the Center for Epidemiology Study of Depression (CES-D) and the Beck Depression Inventory have been used to screen for depression among older and mixed aged adults (Bell et al., 2005; Black, 1999; Hunkeler et al., 2000). However, in a study to validate both the GDS and Beck Depression Inventory in adult cardiac patients (aged 39 to 92 years), Low and Hubley (2005) found that both tools demonstrated excellent sensitivity (detecting truly affected or diseased persons) for detecting major depression and dysthymia. The GDS was better able to differentiate those who were depressed from those who were not depressed and was recommended by the authors as a better depression-screening tool for adult and older adult cardiac patients than the Beck Depression Inventory.

The original 30-item Geriatric Depression Scale (GDS) proved to be time consuming for clients and staff. Although the 15-item GDS is the most commonly used version, the newest version of the GDS is the 5-item short form (Hoyl et al., 1999). The five-item Geriatric Depression Scale (GDS) was the tool used to screen for depression for this study.

Rinaldi et al. (2003) compared the Italian translation of the five-item GDS with the Italian translation of the 15-item GDS among 181 people (over 60 years), in three different settings (community, nursing homes and hospitals) in Italy. All participants had a comprehensive geriatric assessment by a geriatrician experienced in the management of depression. The five-item GDS was compared to the 15-item GDS by the geriatrician, using the clinical diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition as the criterion standard.

The five-item GDS had a sensitivity of 0.97 (proportion of those truly affected with the condition being screened) and a specificity of 0.85 (proportion of truly non-affected persons). The study found that the five-item GDS had a predictive value of 0.85 (the probability that a person with a positive screening test of a condition is a true positive, and a negative test is a true negative) and a negative predictive value of 0.94 (persons with a negative test who are free of the condition). In addition, the authors found 0.90 accuracy for predicting depression.

The five-item and 15-item GDS showed significant agreement with the clinical diagnosis of depression, with good interrater reliability (measure of the consistency between the ratings/values assigned to a characteristic being rated, or agreement between two raters/observers) and test-retest reliability (assessing the stability of an instrument by calculating the correlation between scores obtained on repeated administrations). Similar values were obtained in each setting and in both sexes. The authors concluded that the 5-item GDS is as effective as the 15-item GDS for screening for depression in cognitively intact older adults.

The GDS test is taken orally. Participants are asked questions in a face-to-face interview.

Clear YES or NO answers score points

The five-item GDS questions are:

- | | |
|--|---------------|
| 1. Are you basically satisfied with your life? | Yes/No |
| 2. Do you get bored? | Yes/No |
| 3. Do you often feel helpless? | Yes/No |
| 4. Do you prefer to stay at home rather than going out and doing new things? | Yes/No |
| 5. Do you feel worthless the way you are now? | Yes/No |

Answers in **BOLD** indicate depression. For clinical purposes, a response in **BOLD** of 2 or more of the 5 items on the above questionnaire is suggestive of depression and indicates the need to complete all 15 questions (Rinaldi et al., 2003). If a participant on this study scored six or more on the 15-item GDS, (indicating depressive symptoms) the researcher requested their consent to refer to their family doctor.

In an observational study, Reza, Taylor, Towse, Ward and Hendra (2002) examined depressive symptoms among community-dwelling older adults in an ambulatory care medical clinic in South Yorkshire, England. Comparing 30 people with type 2 diabetes (mean age 74.2 years) switching from oral medications and starting insulin and 10 people continuing oral medications for type 2 diabetes, the researchers found that (using the 15-item GDS) the baseline mean GDS score for the insulin treated group was 5.0 (median range 3-7), compared to the mean GDS score of 3.0 (median range 1-8) at baseline for the control group. After 12 weeks of treatment follow-up for both groups, the insulin-treated group showed significant

reductions in GDS scores (improvements in mood). The mean GDS score for the insulin treatment group was 3.0 (median range 1-5) at 12 weeks compared to the control group mean GDS score of 5.0 (median range 3-7) at 12 weeks, ($p = < .01$). Participants in the insulin intervention group reported improvements in well-being, an increase in patient satisfaction and reduction in diabetes stress over the 3 month study when compared to the control group.

When determining the prevalence of depressive symptoms among 1255 patients (mean age 71.8 years) in geriatric outpatient clinics in Turkey, Cankurtaran, et al. (2004) found that GDS scores (15-item GDS) were greater than 5.0 (indicating depressive symptoms) for 382 (30.4%) of participants. The 382 people with GDS scores greater than 5.0 suffered from more than one co-morbid illness such as high blood pressure, diabetes, osteoporosis, bronchial asthma or chronic obstructive pulmonary disease. Older people living alone with fewer social supports and 2 or more co-morbid illnesses had higher GDS scores than the same cohort living with family or relatives.

Similar results were found by Mast, Yochim, MacNeill and Lichtenburg (2004) in an 18-month study among 77 individuals (mean age 72.4 years) in geriatric outpatient rehabilitation clinics in Kentucky, investigating the relationship between depressive symptoms and number of cerebro-vascular risk factors (CVRF) such as diabetes and high blood pressure. Results demonstrated a significant statistical interaction between the number of CVRF and depressive symptoms. At baseline, the mean GDS score (15-item GDS) for patients with no risk factors was 3.3, with one risk factor was 3.5, and with 2 or more risk factors the mean GDS score was 7.3. At baseline, 19.5% of patients scored greater than 5.0 on the GDS. At 18-months, there was a significant increase in GDS scores as the number of

CVRF increased from zero to one or two. The researchers reported there was an effect for increasing CVRF and depression ($p = .00$).

Problem Areas in Diabetes Scale

The Problem Areas In Diabetes Scale (PAID) was completed by each individual consenting to participate in the study to identify diabetes-related stress (Appendix F). In diabetes, problems and stress are often assumed to be related to the day-to-day anxiety of living with diabetes. The PAID questionnaire captures the person's perspective on current emotional issues of diabetes and its treatment. It was designed as both a clinical tool and an outcomes measure (Welch, Weinger, Anderson & Polonsky, 2003). Emotional stress in diabetes leads to certain physiological and psychological outcomes such as increased symptom severity, decreased functional status, increased depression and "diabetes burnout" (Polonsky, 2000). Clinicians can assess emotional stress in formal and informal ways. By acknowledging emotional stress, information shared between the clinician and client can be employed to develop a goal-directed therapeutic relationship (Grey, 2000).

The PAID is a measure of diabetes-specific emotional and psychological distress developed in 1995 by Dr Garry Welch and Dr Bill Polonsky (Harvard University) and the Joslin Diabetes Center in Boston, Massachusetts. It was originally written in English, but is translated into many languages and is used extensively in research studies worldwide. The PAID questionnaire is part of two web-based software programs for diabetic teaching (Accu-Check Interview and Diabetes Self-Care Profile) and is used in many hospitals around the world as a tool to allow diabetes educators to screen for psychological variables and address issues with individuals while using a motivational interviewing approach (Fisher, 2006).

This self-administered questionnaire consists of 20 items that cover a range of emotional problems frequently reported in people with diabetes, such as “not having clear goals for diabetes care”, “fear of low blood sugar reactions”, “feelings of deprivation regarding food and meals”, “feeling alone with diabetes” and “coping with complications of diabetes”. Each item is scored 0 to 4 (“Not a problem” to “Serious problem”). The sum of the 20 items is then multiplied by 1.25 to yield a final score of 0 – 100 (Appendix G). Scores from 0 to 20 indicate low stress levels. Moderate stress levels are indicated in the range of 21 to 50. A score above 50 indicates that a person is at risk for high levels of diabetes-related stress. Completing the PAID takes about 3-5 minutes (Polonsky et al., 1995; Welch, Weinger, Anderson & Polonsky, 2003).

Data from studies from a literature search for the period 1995-2001 (using PubMed) showed that nurse-led diabetes education sessions were associated with improved blood glucose values and reduced PAID scores. Jackson, Ovalle and Quickel (1999) showed that PAID scores were reduced up to 13 points and blood glucose values dropped significantly by 1% in an intensive five-day outpatient education program at the Joslin Diabetes Center, Boston, among 192 American people with diabetes (mean age 53.5 years). In a six-month diabetes education intervention with nurse case managers among 27 poorly controlled African American women with type 2 diabetes (mean age 52.3 years), Melkus, Spollett, Tuohy, Kaisen, Jefferson and D'Eugenio et al. (1999) found that blood glucose levels and PAID scores were reduced.

Three larger studies involving mixed aged adults (21-92 years) with diabetes in Holland, Croatia, Great Britain, and the United States found that diabetes-specific emotional problems were particularly prevalent in depressed people, especially among those with

unstable blood glucose levels. In two of these studies, depression was assessed using the Center for Epidemiologic Studies Depression Scale or CES-D (a 20-item questionnaire designed to assess the major symptoms of depression) and diabetes-related stress was assessed by the PAID questionnaire (Clarke, Snyder, Meek & Stutz, et al., 2001; Polonsky, Fisher, Earles & Dudl, 2005; Pouwer et al., 2005). Clark et al. (2001) found that among older adults aged over 64 years, higher PAID scores correlated with self-reported depressive symptoms. For those participants who were high-risk for diabetes-related stress (higher PAID scores), Clark et al. and Polonsky et al. (2005) found that a telephone call to the patient was sufficient to update the patient's condition or make minor changes to medications or recommendations for diet regimes. Clark et al. indicated that the PAID questionnaire was an important part of the assessment for older adults regarding uncertainty about managing their diabetes, such as "getting off track" with diet or medication. The telephone intervention proved to be useful for facilitating communication and collecting data that was helpful for the patient and the nurse to review diabetes problems and initiate changes as needed.

Ethics

This study was approved by the Queen's University Health Science Research and Ethics Review Board and by Providence Care Ethics Review Board. Providence Care approved of demographic data collection.

Statistical Analysis

The data were analyzed using the statistical program SPSS version 14 (Carver & Nash, 2006). Descriptive analyses, percentages and relative frequencies (for categorical variables), Chi square tests, Fishers Exact tests and t tests were used to test for differences in the socio-demographic and clinical characteristics between the intervention group and usual

care group. Relations between subgroups for demographic data were analyzed using the Fisher's Exact test, Chi Square method. To determine differences for depressive symptoms and diabetes-related stress between and within groups over the 12-week period paired sample t tests and Wilcoxon Signed Rank tests (Appendix J) were used to compare values for the GDS and the PAID questionnaire at baseline (Time 1) versus 12-weeks (Time 2). The Wilcoxon Signed Rank matched pairs test is a non-parametric test that is analogous to the parametric t test and was used to confirm the statistical results (Hazard-Munro, 2005). The GDS and PAID scores (Appendix G) were confirmed by the researcher after baseline data and randomization were completed, and again after the 12-week study when the GDS and PAID scales were repeated. At baseline, demographic data were obtained from each participant to examine characteristics of the sample, using the socio-demographic data instrument (Appendix D). A frequency table (Table 1) was used to compare socio-demographic data for the intervention and control groups to detect differences between groups.

Responses from the weekly telephone calls and open-ended questions (from the intervention group) were analyzed qualitatively for themes and the participant's preferences and recommendations. As outlined by Loiselle and Profetto-McGrath (2004), methodological triangulation (using multiple methods of data collection) was used to link and integrate quantitative and qualitative approaches of data collection (Miles & Huberman, 1994).

During the weekly telephone calls with the intervention group participants, data were clarified with participants to ensure accuracy. For example, when participants reported that their best achievement with their diabetes care was to improve their diet, the research nurse clarified how they had improved their diet (e.g., by eating smaller portions, eating regular

meals or eliminating ice cream or snacks). In addition, the author asked for checks, feedback and clarification when a participant reported symptoms such as “not feeling well” and participants explained why they felt unwell, describing concerns such as fatigue, dizziness or sleep disruptions. A process outcomes matrix was created to analyze the participant’s responses into themes (Miles & Huberman, 1994). From a narratology or narrative analysis perspective, the qualitative inquiry process illustrated what the narrative or story revealed about each person and their world, and how individuals attempted to accomplish their goals through specific behaviors in their unique environments. The data matrix was a classification system consisting of cells. Each numbered cell was related to a specific topic or event that participants reported over the 12-week study. Patterns, themes and categories began to emerge from systematic comparative analysis as the study progressed (Miles & Huberman, 1994) for example, thoughts of death and dying or not understanding glucometers. Comparison and analyses of themes identified consistent categories that emerged in terms of a more central focus as seen in Table 4 and in the responses to the four questions regarding the telephone intervention.

CHAPTER 4

Results

Characteristics of the sample

Twenty-eight eligible individuals volunteered and participated in the study, 11 men and 17 women. No one who was approached declined to participate. The participants were randomized into two groups as depicted in Appendix B. Participants were enrolled in the study at discharge from clinic or telephoned the research nurse at a later to date to volunteer for the study. The study catchment area was from Smiths Falls to Brockville, Westport and Kingston in Southeastern Ontario.

All participants completed the 12-week study. Four participants (two men and two women) in the intervention group were hospitalized during the 12 weeks, and continued with the study after hospitalization. Demographic data were collected at baseline using the socio-demographic guide (Appendix D) to determine characteristics of the sample. These data were included in the study as certain characteristics such as functional disability and symptoms such as incontinence or variable blood glucose values may be predictors of stress or depression and associated with frequent use of health services or hospitalization in older adults (Chumbler, Vogel, Garel & Qin et al., 2005).

The demographic characteristics of the sample are presented in Table 1 (p.49). Mean age of the study sample was 74.18 years ($SD = 5.59$) with a range of 65 – 84 years. At baseline, two participants (7.1%) reported a new diagnosis of diabetes within the last year. Five participants (17.9%) reported having diabetes for 6–10 years. The majority of participants (32.1%) reported having diabetes between 11–20 years. Four participants (14.3%) in the study reported having diabetes for over 20 years. Twenty-six participants in

the study (92%) reported that they had never received any diabetes education and two participants (7.1%) recalled some diabetes education years ago.

Table 1

Socio-demographic characteristics of study participants at enrollment (N=28)

	Intervention Group n=15	Usual Care Group n=13		
	Frequencies <i>n</i> (%)		<i>t</i>	<i>p</i>
Mean Age	73.67 yrs (SD = 6.43)	74.77 yrs (SD = 5.70)	-.47	.64
Gender				
Female	10 (66.7)	7 (53.8)		.70*
Male	5 (33.3)	6 (46.2)		
Marital Status				
Married	5 (33.3)	5 (38.5)		1.00*
Divorced, widowed	10 (66.7)	8 (61.5)		
Living arrangements				
Alone	9 (60.0)	7 (53.8)		.95*
With others	6 (40.0)	6 (46.2)		
Education				
Grade school	3 (20.0)	2 (15.4)		1.00*
High school, University	12 (80.0)	11 (84.6)		
All medications (Prescription & OTC)				
1 – 9	9 (60.0)	9 (69.2)		.60*
10 – 18	6 (40.0)	4 (30.8)		
Comorbidities				
None	1 (6.7)	1 (7.7)		.42*
1 – 2	10 (66.7)	11 (84.6)		
3 or more	4 (26.7)	1 (7.7)		

t = Independent samples t test. *Fisher's exact test

Table 1 continued

Table 1

Socio-demographic characteristics of study participants at enrollment (N=28)

	Intervention Group n=15	Usual Care Group n=13	<i>t</i>	<i>p</i>
	Frequencies <i>n</i> (%)			
Activities of Daily Living				
Independent	9 (60.0)	7 (53.8)		1.00*
Some Assistance	6 (40.0)	6 (46.2)		
Functional ability				
Independent	6 (40.0)	6 (46.2)		.80*
Mobility aid	9 (60.0)	7 (53.8)		
Pain				
No pain	2 (13.3)	5 (38.5)		.30*
Pain	13 (86.6)	8 (61.5)		
Continence				
Continent	2 (13.3)	4 (30.8)		.25*
Urinary incontinence	11 (73.3)	9 (69.2)		
Urinary & fecal	2 (13.3)	0		
Homecare				
Yes	5 (33.3)	0		.04*
No	10 (66.7)	13 (100)		

t = Independent samples *t* test. *Fisher's exact test

Diet. All study participants reported they ate a regular diet and did not count carbohydrates, calories or fats. The majority of participants (78.2%) said that they had no interest in dietary restrictions and nine participants (32.1%) managed their diet to prevent hyperglycemia by eating smaller portions. Eight participants (28.6%) reported they would prefer to walk or exercise rather than consider dietary restrictions.

Homecare. Only five participants in the study received homecare services. All five participants (33.3%) were in the intervention group; they received homecare services for assistance with bathing, meal preparation and daily assistance with support hose. Two of the five participants (13.3%) in this group required daily dressings. No participants in the usual care group received homecare services. No participants in either group had ever received homecare for assistance with medications or diabetes monitoring. There was a statistical difference in the demographic data for homecare at baseline. All five participants receiving homecare were in the intervention group and this may have influenced results (Table 1). However, homecare support was not for help with medications or diabetes management and was discontinued for 4 people during weeks two and three of the study when they no longer required dressing changes and help with a weekly bath and meal preparation. The remaining person with homecare required 15 minutes each morning for help with compression stockings.

Functional ability and pain. Baseline data showed that most participants (42.9%) were functionally independent. People who were wheelchair dependent were equally divided between groups. Of the eight wheelchair dependent participants, 50% were below-knee amputees (two men and two women), and two (7.1%) participants were women recovering

from falls sustaining a fractured hip and fractured pelvis respectively. Two participants had been wheelchair dependant for some time because of amputated toes, leg weakness and falls.

Seven (25%) study participants reported one fall in the past year and five people (17.9%) reported two falls in the past year. Nine of these 12 study participants reported that they had sustained major injuries from falls in the past two years requiring hospitalization (fractured hip, shoulder, wrist, nose, skull, pelvis and eye injuries). At baseline, more than twice as many women (17.9%) reported falls than men (7.1%). Similarly, baseline statistics showed twice as many women (68.4%) than men (31.6%) reported “all-over” pain, and 19 individuals in the study (67.9%) stated they suffered from chronic generalized pain, which negatively affected their quality of life.

Continence. Twenty study participants (71.4%) reported urinary incontinence at baseline. In this group, 12 women (60%) and 8 men (40%) reported urge or stress urinary incontinence. Some participants stated that their incontinence may be related to functional disability and being unable to reach the bathroom quickly, or their incontinence may have been made worse or complicated by higher than normal blood glucose values. One man and one woman each reported a serious fall while rushing to the bathroom. Fifty percent of the 20 participants who reported urinary incontinence said that they recognized high blood glucose values were associated with urinary incontinence and they reported that they struggled to keep their glucometer blood glucose readings below 10.0 or 12.0 mmol/L. Four participants (14.3%) in this group who reported urinary incontinence said their blood glucose readings were often high and varied between 12.0 and 20.0 mmol/L. One male and one female participant (7.1%) reported both chronic urinary and fecal incontinence. Both stated that this

was extremely stressful as it affected their lifestyles. They were unable to travel long distances in a car and they had declined social outings in the past.

Self-monitoring of blood glucose. Most participants in the study (92.9%) at baseline reported they were able to use their glucometers to monitor their blood glucose levels. One person reported that her daughter helped with monitoring her blood glucose, and one person depended on the family doctor to monitor blood glucose levels at routine visits. This person obtained his own glucometer, and said that he was able to self-monitor his blood glucose levels during the 12-week study. Baseline data showed large ranges in blood glucose values for all participants. All reported blood glucose values were taken by the participants themselves using their own glucometers. Only two people in the study (who were randomized to the usual care group) reported normal fasting blood glucose levels between 4.2 – 6.0 mmol/L. At baseline, both subjects reported these values were consistent as their glucometers had a 30-day memory and they could track their results from the previous month. Three of the study participants had experienced hypoglycemic episodes (low blood glucose < 4.2mmol/L) in the past year.

When baseline data were analyzed, almost half (46.7%) of the individuals randomized to the intervention group reported fasting blood glucose values between 7.0 and 9.0 mmol/L. While only four (30%) subjects in the usual care group reported fasting blood glucose levels in this range. However, almost three times as many participants (20.0%) in the intervention group reported regular high blood glucose levels between 14.0 and 19.0 mmol/L, compared to 7.7% in the usual care group.

More people in the usual care group (23.1%) said that their blood glucose levels “varied and were unpredictable” than in the intervention group (13.3%). No statistical

difference was found between mean fasting blood glucose levels for the intervention group ($M = 12.1$, $SD = 1.8$) or the usual care group ($M = 12.4$, $SD = 2.2$), $t(26) = 0.07$, $p = .41$ at baseline.

Participants in the intervention group were asked to self-monitor and record fasting blood glucose values for the duration of the 12-week study. All participants in the intervention group stated that they were more motivated and vigilant about self-monitoring their blood glucose and recording blood glucose values during the study because they wanted to be prepared with the correct information when the nurse called the following week.

Six people (40.0%) in the intervention group were taking insulin. Four participants in this group reported adjusting their own insulin doses up or down according to their blood glucose values. One participant reported that the insulin units on the insulin pen were difficult to see and she needed a magnifying glass to read the insulin dose before giving her injection. One participant expressed confusion and frustration because despite checking his blood glucose four times a day and administering his insulin, his glucometer reading rose from 17.0 to 27.0 mmol/L over a period of nine days. At the request of the study researcher he made a doctor's appointment. Unfortunately, he could not get an appointment for two weeks. The researcher suggested that he telephone the doctor's office to explain his concern regarding his rising blood glucose. When he did this, his insulin dose was increased over the telephone by 17 units. He was not given any education regarding the signs and symptoms of hypoglycemia, and no follow-up appointment was given. The following week, his fasting blood glucose values were consistently in the 10.0-12.0 mmol/L range.

Hospitalizations. During the 12-week study, four (26.7%) individuals in the intervention group were hospitalized for dehydration, shortness of breath, congestive heart

failure and clinical depression respectively. Length of stay varied from two days to two weeks. All participants who were hospitalized called the research nurse after discharge from the hospital and requested to continue with the study. One person in this group went to the Emergency Department four times during the 12-week study because of shortness of breath, feeling unwell (self-monitored blood glucose values between 12.0 and 15.00 mmol/L), chronic urinary and fecal incontinence and dehydration. He reported that he had never received any diabetes education and to reduce his anxiety of living alone and his stress of coping with his illness, he purchased a glucometer and asked the research nurse how to use it appropriately. Although he was not referred to the Diabetes Education Clinic for formal diabetes education from the Emergency Department, he did make an appointment with his family doctor following the emergency visits.

Geriatric Depression Scale

Mean scores for the Geriatric Depressions Scale were calculated for the intervention group and the usual care group. At baseline, the mean Geriatric Depression Scale (GDS) score for the intervention group was 4.26, ($SD = 4.16$). At 12 weeks the intervention group GDS scores were significantly lower ($M = 1.93$, $SD = 2.21$), $t(14) = 3.61$, $p = .00$ (Figure 1, Table 2). At baseline, the mean GDS score for the usual care group was 1.69 ($SD = 1.97$). At 12 weeks the mean GDS score for the usual care group was not significantly different ($M = 1.46$, $SD = 1.71$), $t(12) = 0.39$, $p = .69$ (Figure 1, p.57, Table 2, p.58).

In the intervention group, four people scored 6 or over on the GDS at baseline, compared to only 2 people in this group scoring 6 or over at 12-weeks. For the usual care group, two people scored 6 or over on the GDS at baseline and no-one in this group scored over 6 at 12 weeks.

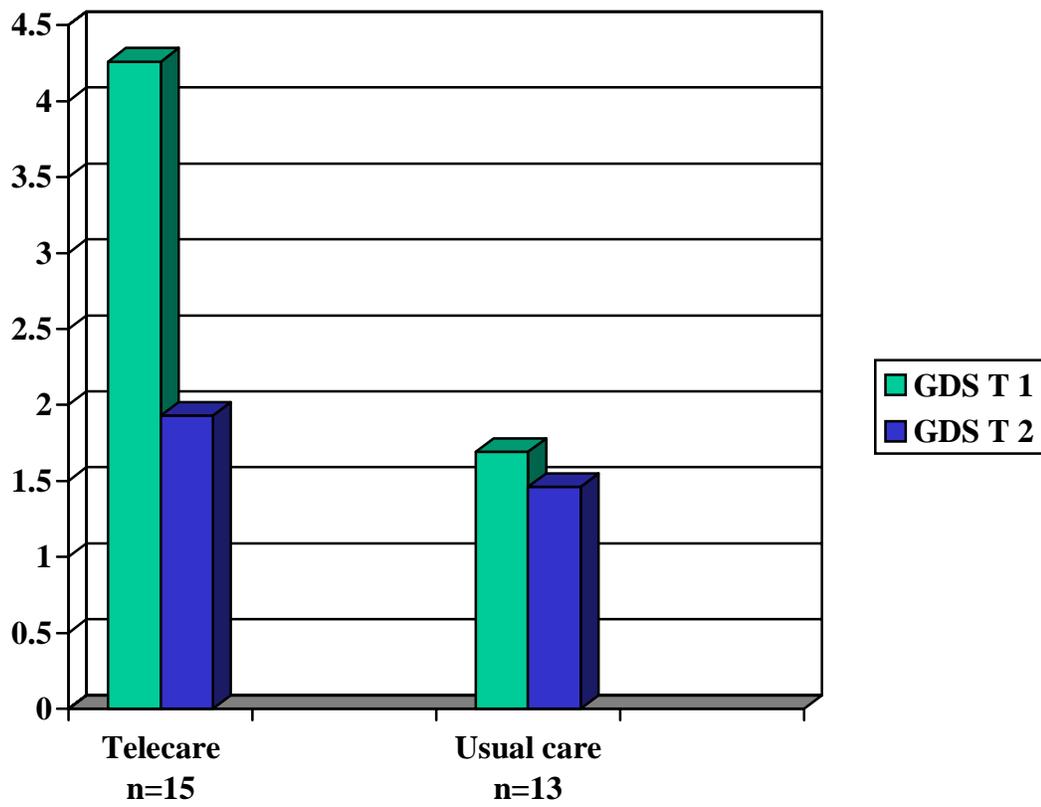
The mean GDS scores for both groups in this study at baseline and at 12 weeks were similar to those previously mentioned in the literature using the GDS among older adults (Canturtaran, et al., 2004; Mast, Yochim, MacNeill & Lichtenburg, 2004).

It should be mentioned that the individual with the highest GDS score of 13.0 at baseline (of all the 28 participants on the study) was randomized to the intervention group. From a clinical perspective, a response of more than 2 on the 5-item GDS is suggestive of depressive symptoms and indicates the need to complete all 15 questions on the questionnaire. A score of more than six on the 15-item GDS is suggestive of depression. This participant received daily homecare visits for dressing changes for a large infected abdominal wound. During weeks nine and ten of the study this person was hospitalized for two weeks and diagnosed with major clinical depression. However, the person requested to continue with the study after the hospital stay.

The higher mean GDS score for the intervention group allows more room for this group to improve, but the high GDS score of 13 for the person in the intervention group may have influenced this result. This extreme score or outlier (a value that is unusual or in this case, greater than the normal range of scores) was a legitimate value. Extreme scores can exert a powerful influence on the mean and result in a misleading picture of the distribution of values (Polit, 1996). By excluding the outlier to adjust for imbalances at Time 1 and Time 2 the mean GDS score for the 14 remaining participants in this group at baseline was 3.50, ($SD = 3.25$). At 12 weeks, when the outlier was excluded from the calculation ($n=14$), the mean GDS score for the intervention group was 1.57, ($SD = 2.02$), $t(13) = 2.90$, $p = .01$, as shown in Table 2. Therefore, without the outlier the GDS scores decreased significantly in the intervention group.

Figure 1

Geriatric Depression Scale Scores at Time 1 and Time 2



Mean Scores

Table 2

Geriatric Depression Scale Scores for the Intervention Group and Usual Care Group

	Time 1		Time 2		<i>p</i>
	Mean	SD	Mean	SD	
Intervention group (n=15)	4.26	4.16	1.93	2.21	.00**
Intervention group (n=14) ^a	3.50	3.25	1.57	2.02	.01*
Usual care group (n=13)	1.69	1.97	1.46	1.71	.69

* $p < .05$, two tailed. ** $p < .01$, two tailed. ^a Outlier removed.

Problem Areas In Diabetes

Responses to the PAID questionnaire at baseline were varied and participants showed variation in the degree to which they believed diabetes-related stress affected their lives.

Paired sample t tests were used to test for significant differences in the scores for the PAID scale for the intervention and usual care groups from Time 1 to Time 2.

At baseline, the mean PAID score for the intervention group was 21.23 ($SD = 22.70$), and at 12 weeks the mean PAID score for this group was significantly lower, mean 8.00 ($SD = 7.65$), $t(14) = 2.47$, $p = .03$. The mean PAID score for the usual care group at baseline was 13.17 ($SD = 14.02$), and at 12 weeks this score was not significantly lower at 12-weeks ($M = 10.34$, $SD = 6.69$), $t(12) = 0.83$, $p = .42$) as shown in Table 3. In agreement with research findings by Melkus, Spollett, Tuohy, et al., (1999) and this study, it was found that for participants in the intervention group blood glucose levels and PAID scores were reduced.

It should be noted here that the participant in the intervention group with the high GDS score of 13.0 at baseline did not have an extreme score on the PAID scale. At baseline, this participant had a PAID score of 20.0 and a score of 12.25 at 12 weeks. However, there were three high scores on the PAID scale at baseline, two scores of 50.0 and one score of 51.25. Of these three participants, one woman had recent surgery for a below knee amputation, another woman was recovering from a wrist fracture after a fall, and the third person (also a woman) was not able to see the units on the insulin pen when administering insulin.

Table 3

Problem Areas In Diabetes (PAID) Scores for the Intervention Group and Usual Care Group

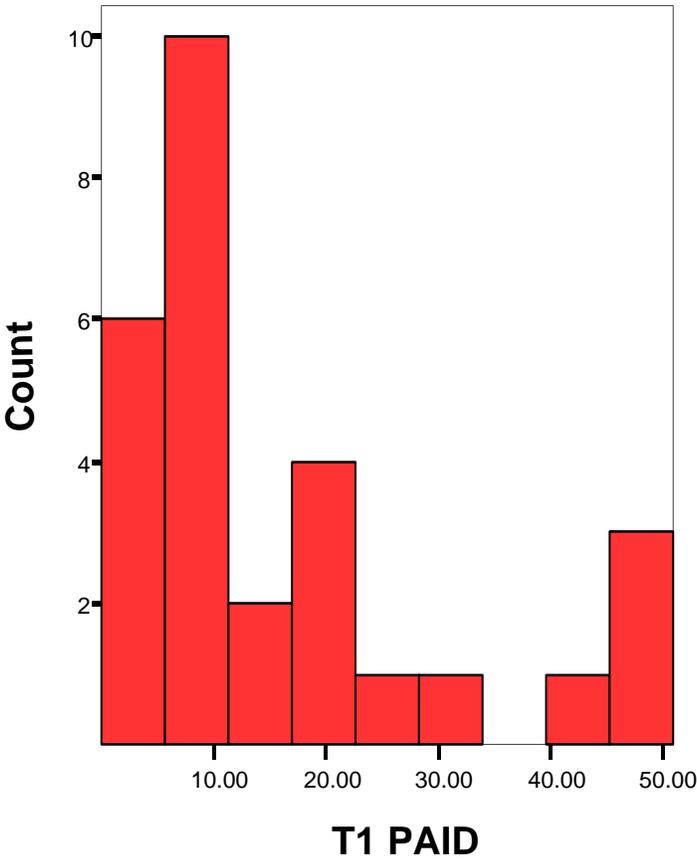
	Time 1		Time 2		<i>p</i>
	Mean	SD	Mean	SD	
Intervention group (n=15)	21.23	22.70	8.00	7.65	.03*
Usual care (n=13)	13.17	14.02	10.34	6.69	.42

**p* < .05, two tailed.

Figure 2

Problem Areas In Diabetes (PAID) Scores at Time 1 for the study sample

Number of participants (N=28)

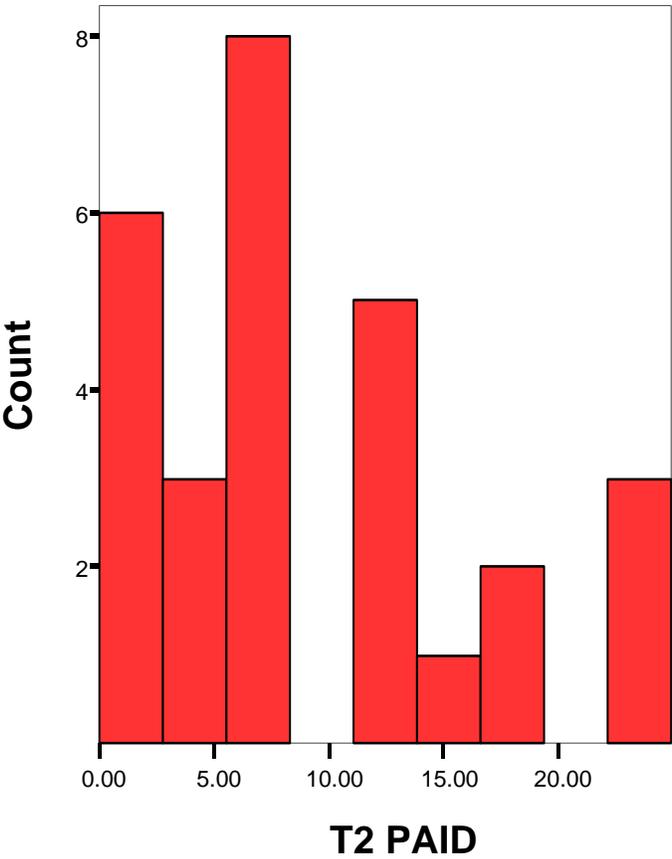


PAID Scores at T1

Figure 3

Problem Areas in Diabetes (PAID) Scores at Time 2 for the study sample

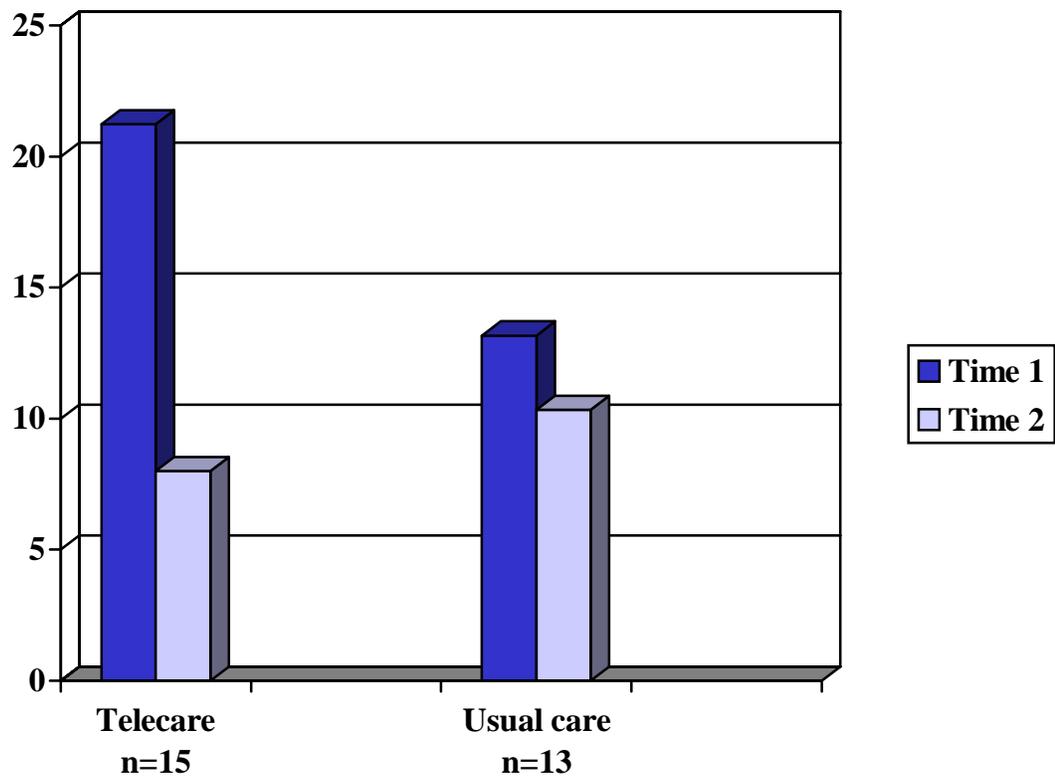
Number of participants (N=28)



PAID Scores at T2

Figure 4

Problem Areas In Diabetes Scale Scores at Time 1 and Time 2



Mean Scores

Responses to weekly telecare questions

The intervention group responses to the weekly questions in the telephone intervention are presented in Table 4. Despite the length of years that participants reported living with diabetes, all participants in the intervention group reported frustration with their diet requirements. One participant reflected the comments of many by describing his lack of understanding a specific diet regime to improve his blood glucose values. In terms of the research question to examine how older adults describe their experience managing their diabetes self-care, most participants said that they would like individualized plans of care and healthcare practitioners who would listen to their concerns and give them simple, concise instructions to follow. Likewise, many participants verbalized helplessness and frustration regarding poor glycemic control despite their struggles to manage their diet and “keep on track”. Furthermore, in response to the final research question, all participants reported that they found the telecare intervention useful for support with their healthcare needs.

In response to the weekly question describing their best achievement with diabetes care, all participants in the intervention group reported that they were more motivated to adjust their diet. Participants reported focusing on various methods of modifying their diet that they had tried in the past, such as eating smaller portions, eliminating snacks such as chips, cookies and ice cream, and focusing on regular meals instead of “getting by” with tea and cookies. Four of the 15 people in the intervention group reported that they made an effort to exercise more. Three people reported they were walking more frequently, and one person reported making more effort to regularly follow the exercise program from the Amputee Rehabilitation Clinic.

Table 4 Responses to weekly telephone questions organized by themes

Themes	Responses	Number of participants who mentioned topics at least once	%
Diet	• Not understanding how dietary restrictions are related to maintaining normal blood glucose values.	8	(53.3)
	• No appetite	5	(33.3)
	• Wondering what to eat, trying to lose weight	4	(26.7)
	• Reduced meal portions and smaller meals to maintain normal blood glucose values	3	(20.0)
	• Not cooking – snacking only	2	(13.3)
Pain & depression	• I don't know why I'm so "down and blue", if it's because of the pain or if my blood glucose is high	8	(53.3)
	• Crying and weeping on the telephone – pain everywhere	4	(26.7)
Tired and weak	• Complaints of tiredness and weakness – have to lay down and rest during the day	5	(33.3)
	• I do not sleep at night, and then I am tired all day	4	(26.7)

Table 4 Responses to weekly telephone questions organized by themes

Themes	Reponses	Number of participants who mentioned topics at least once	%
Frustration	<ul style="list-style-type: none"> • Frustrated with diet, glucometers, blood glucose values, medications & incontinence 	4	(26.7)
Fear of falling	<ul style="list-style-type: none"> • I am afraid I will fall and injure myself again • I am afraid of falling in the bathroom • I do not go out in the winter, I am afraid of falling 	3 2 2	(20.0) (13.3) (13.3)
Thoughts of death & dying	<ul style="list-style-type: none"> • I get these bad thoughts in my head, crazy thoughts that I might not wake up next day • I am always thinking about death and dying, why are these thoughts in my head 	1 7	(6.7) (46.7)
Poor vision	<ul style="list-style-type: none"> • Blurred vision and dizziness • I can't see the insulin units on my insulin pen 	4 2	(26.7) (13.3)

Table 4 Responses to weekly telephone questions organized by themes

Themes	Reponses	Number of participants who mentioned topics at least once	%
Doctor's visits	• I can't get a doctor's appointment, is my blood sugar high?	3	(20.0)
	• One day my blood glucose is high, and then it goes down again, should I see my doctor?	2	(13.3)
Diabetes & health	• I need to learn more about my health	6	(40.0)
	• I need a new glucometer	3	(20.0)
Feeling helpless	• Feeling helpless or that something bad might happen or an uncertain future	6	(40.0)
Limited income	• Taxi fares and transportation were expensive on a limited income	4	(26.7)
	• Purchasing glucometer strips was costly	4	(26.7)
	• Isolation related to limited finances and transportation expenses	6	(40.0)

Table 4 Responses to weekly telephone questions organized by themes

Themes	Reponses	Number of participants who mentioned topics at least once	%
Exercise	• People who would consider exercising rather than change diet	8	(53.3)
	• People who reported they had started to walk or exercise more	4	(26.7)
Fears	• Not understanding glucometers, glucose measuring and diabetes	7	(46.7)
	• Fear of not being able to manage alone	5	(53.3)
Social support	• Family and friends help with housework, meal preparation, groceries, shopping, & transportation to appointments	6	(40.0)
	• Access bus for transportation	4	(26.7)
	• Driving	5	(33.3)
	• Family take care of participant's pets for vets appointments etc	3	(20.0)
	• Participants who would like to learn more, meet people with similar experiences, share information about diabetes & find community services, resources & affordable foot care	15	(100.0)

Responses concerning depressive symptoms, anxiety, emotional stress and quality of life

Rubin and Peyrot (2001) suggest that for people with diabetes, anxiety and stress represent an exaggerated emotional response to the fears they experience. Individuals with diabetes are at greater risk for these disorders because they often live with sources and levels of fear greater than those that most people experience do. The fear of low blood glucose levels, complications and the effects of diabetes on everyday life are common fears voiced by people trying to self-manage their illness. Similarly, Welch, Jacobson and Polonsky (1997) state that anxiety disorders are often undiagnosed and untreated in people with diabetes. This may be a result of confusion regarding common physical symptoms of anxiety and low blood glucose levels or simply the misidentification of anxiety disorder as poor adjustment to diabetes. Although there is a dearth of literature about the effects of anxiety on metabolic control among people with diabetes, Rubin and Peyrot (2001) suggest that severe anxiety may affect quality of life and, by interfering with diabetes self-care, may affect metabolic control.

For participants in the intervention group, limited resources such as financial restraints and lack of transportation were mentioned frequently during the weekly telephone calls, contributing to perceived poorer quality of life, worry and stress. Lack of knowledge about resources such as diabetes education programs and lack of access to resources such as meals-on-wheels, information about how to purchase a walker or access to personal support workers were common concerns. Not having transportation for shopping or going to appointments, lack of social support or isolation and the restrictions of a set income, were themes that emerged from conversations with all participants in the intervention group during

the weekly telephone calls. Some participants stated that a box of glucometer test strips cost \$100.00, and they found this was very expensive on a limited income.

During the telephone conversations, the majority of participants in the intervention group also expressed emotions in their life. Fears of the future and of death and dying were common and disturbing to half of those in the intervention group. Four participants in the intervention group (three women and one man) would occasionally cry and weep during the telephone calls. Some in this group stated that they were afraid they would have to face the day that they would be unable to manage alone and have to leave their homes. Others could not explain why they felt down or “blue”.

Fear of falling was experienced by 50% of individuals in the intervention group. The majority of participants who had suffered serious falls and fractures were afraid that they would not be able to manage alone if they became disabled as a result of a fall and needed a permanent walker or wheelchair. Most of this group relied on family and friends for social support with shopping and meal preparation. Despite these fears, only one person in the intervention group owned a Lifeline (personal emergency alarm).

Six (40%) participants in the intervention group discussed the daily stresses of managing diabetes such as maintaining normal blood glucose, managing their diet, and trying to lose weight. Some participants in this group stated they had developed ineffective coping mechanisms over the years such as testing their blood glucose less frequently or reducing meal portions and snacking to prevent their blood glucose values rising. Four people (26.2%) in the intervention group had developed creative solutions for managing their diet, such as recording their food intake and medication times in a diary, and having meals-on-wheels delivered to their door.

All participants in the intervention group said they understood the importance of keeping blood glucose low to avoid complications. All agreed that when their blood glucose was higher than normal they felt “awful” or “tired” and “unwell”, but some said that the danger of complications “did not concern them at present”; however, they recognized “complications might eventually happen in the future”. The majority of participants in the intervention group expressed that they felt nervous or anxious when their blood glucose values were “up and down” or “unpredictable”. One individual in this group stated that he did not tell his doctor that he had difficulty understanding his blood glucose values and how to manage them for fear of seeming “stupid” but he was “relieved” to talk about this with a nurse.

Responses to the four questions regarding the telephone intervention

Themes that emerged from responses to questions about the effectiveness of the telephone intervention showed that living year after year with a chronic illness does not necessarily mean learning to understand it or how to manage the illness and treatment. Misunderstandings about health situations, anxiety and stress were mentioned frequently, despite regular doctor’s visits.

Most participants agreed that the demands of managing diabetes affect everyone who lives with or cares for the person with the illness. Additionally, there was agreement amongst the participants that the most appropriate help and support with health issues depends on the specific situation. All participants agreed that getting the right support and information at the right time was important to be able to self-manage their diabetes.

Analysis of responses to the first question, “how did the nurse telephone intervention help you with your healthcare problems?” revealed that talking about health problems helped people understand the importance of managing their illness, and is reflected in the following responses:

“It is a new way of communicating about my health and getting information and support with decisions when I need it. It helps me understand my glucometer readings, or when I should see the doctor.”

“I was able to ask all the questions I wanted and I wasn’t afraid to ask questions about little details. If you don’t have anyone to talk to, how can you make the right decisions or find the right kind of help?”

“I felt at ease asking questions”. “Now I know I can go to the pharmacy to get my medications and get my glucometer checked at the same time.”

“I live alone and it was like someone cared.” “I felt more involved with my healthcare”

“Talking to a nurse helped me figure out and focus on what I need to do to take care of my health, you know, ask if I could drink more and I should drink diet-cola, juices or water. It was good support for me to stay on the right track to make sure I was doing the right things.”

Several common themes emerged from the analysis of responses to the second question “how could this type of communication with a nurse help you in the future?” Staying optimistic, thinking positive, easing worries and where to turn for information and help to manage diabetes were identified as positive outcomes of the nurse telephone intervention, according to the following responses:

“It eases my worries in many ways, especially when I am anxious about where to go for help and information. It’s easier to ask a nurse about things that worry me, or things that I feel are not normal such as feeling dizzy, and being overly tired and fatigued, than wait for a doctor’s appointment.”

“Some days I can’t think straight, if something goes wrong, or my blood sugars are high and I don’t know why, I don’t have to lay awake at night thinking about it, I ask the nurse when she calls, and I feel better.”

“I think positive reinforcement is important. Talking regularly to the nurse helped me with future planning for my health and what I need to do. Getting my glucometer put my mind at ease about my diet.”

“I could ask the nurse questions between doctor’s appointments. Often I cannot get a doctor’s appointment when I need one, then it’s a ten-minute appointment, I’m in and out so fast I don’t get any information.”

Collectively, a response shared by all participants in the intervention group to the third question “What was the most important aspect of the nurse follow-up telephone calls for you?” was that simply talking about their health was important. Most participants felt it was easier to talk to a nurse about their health than to their doctor, friends or family. The more participants discussed their health, the more confident they felt about managing their health problems themselves, as acknowledged in the following responses:

“Talking to a nurse about my health brings little things to my attention, especially minor things that I can’t figure out, like, can I take pain medications with my other regular medications. It is important to me to know more about what I need to do to stay healthy.”

“It was a good way for me to learn, I asked the nurse questions each week.”

“Asking a nurse little details was important to me, for example if my blood glucose is high, would my blood pressure also be high. It made me aware that I should keep my regular doctor’s appointments.”

“It was especially important to me to talk to a nurse who took the time to get to know me, and it gave me confidence to ask what I need to do about managing my health. I live alone and I felt more self-assured about my health. It’s like somebody cares.”

In response to the fourth question, “would you recommend nurse telecare to your friends and family, if so, can you tell me why?” all participants agreed that they would definitely recommend the nurse telecare monitoring intervention. Responses were as follows:

“Talking to a nurse on the telephone is not like a doctor’s appointment, you can ask a nurse as many questions as you want, that’s important especially if I’m worried about something. I wait too long for a doctor’s appointment. I would definitely recommend it to everyone.”

“It’s a way to talk and learn about my health. It’s a necessity when you live alone to be able to manage, some days I don’t feel well. I got information when I needed it.”

“Telecare is good for everyone. It gave me confidence to do the right things - about being careful with my diet and medications.”

“Thinking positively is so important to me, especially when I feel “down”. I’m so discouraged about gaining weight. Talking to a nurse helped me understand my feelings and find help, like meals on wheels, now I may be able to manage my diet properly.” “The nursing calls helped me plan for the future, you know, think about goals.”

“Telecare is important to people like me who live in rural areas. Healthcare services should be focused on where they are needed most. Everyone should be able to have it.”

Post hoc analysis

Because of the influence of the outlier on the GDS analyses, the author examined data after the study was concluded to identify patterns that were not specified a priori. In the literature, several sources stated that women experience twice the rate of depression than men (Canadian Mental health Association, 2006; Lin, Katon, Von Korff & Rutter, et al., 2004; Newman, Bland & Orn, 1998). To determine if there were gender differences regarding the GDS and PAID scores a post hoc t test revealed that there was no statistical difference in GDS scores at baseline between the 11 men ($M = 3.10$, $SD = 3.21$) and 17 women ($M = 3.01$, $SD = 3.82$), $t(26) = .13$, $p = .89$ in the study. In addition, at 12 weeks, there was no difference in GDS scores between men ($M = 1.69$, $SD = 1.85$) and women ($M = 1.76$, $SD = 2.10$), $t(26) = -0.16$, $p = .87$.

However, when testing for gender differences in PAID scores at baseline there was a statistical difference between men and women. The PAID score for women ($M = 21.9$, $SD = 23.2$) was significantly higher than the PAID score for men ($M = 10.65$, $SD = 7.41$), $t(26) = -1.5$, $p = .01$. There was no significant difference in PAID scores between the 11 men ($M = 8.40$, $SD = 5.21$) and the 17 women ($M = 9.52$, $SD = 8.35$), $t(26) = -0.39$, $p = .69$. at 12 weeks.

PAID differences at baseline showed that women reported more “somewhat serious” and “serious” problems compared to men. For example, not having clear and concrete goals for diabetes care, uncomfortable situations related to diabetes care, feeling scared living with diabetes, feeling depressed living with diabetes and worrying about serious complications were problems that were more serious for women than for men.

In summary, results from the weekly telecare questions identified problems for the 15 participants in the intervention group that were outlined in the introduction and literature reviews regarding depressive mood and diabetes-related stress. All participants expressed their frustration concerning gaps in healthcare resources, support services and information they needed to manage their illness. Collectively all intervention group participants agreed that they needed help managing some dimension of their chronic disease. As participants in the intervention group became comfortable talking to the research nurse, the telephone intervention began to develop a case management focus. Participants asked for information regarding community resources for support services such as where to buy mobility aids, glucometers or meals-on-wheels. All participants in the intervention group reported that talking to a nurse helped them reflect on strategies to be able to better manage their health (Appendix K).

CHAPTER 5

Discussion

In agreement with the literature, this study shows that regardless of how long a person has lived with diabetes, education, reinforcement and support need to be ongoing. The literature shows that empowerment approach through the telecare intervention enhances the nurse-and-client relationship allowing the individual to be the primary decision maker, helping people reflect on their health, set individual goals and assume responsibility for their care and treatment (Holmstrom & Rosenqvist, 2005; Trief et al, 2003; Westaway, Seager, Rheeder & Van Zyl, 2005).

Results of the study support the hypothesis that a nurse telecare intervention may reduce diabetes-related emotional stress and depressive symptoms among community-dwelling older adults with diabetes. With and without the outlier, GDS and PAID scores were significantly improved from Time 1 to Time 2 for the intervention group and responses to the questions regarding the telecare intervention suggest a high level of satisfaction among the intervention group participants with the nurse telephone follow-up. This may be related to feeling more confident with self-management, increased social contact, improved mood or improved adherence to health-related behaviors. As evidenced by this study and others (Bowles & Dansky, 2002; Chan et al., 2005; Clarke et al., 2001; Durso et al., 2003; Piette, Kraemer & Weinberger et al., 2001), telephone contact and positive feedback from a nurse with individual recommendations regarding mood, stress, health-related questions, medications, diet or blood glucose levels encouraged individuals to reflect positively on, and engage in, self-management of their illness.

Additionally, in terms of the research question regarding participants receptiveness to the telephone intervention, all participants reported approval with the telecare intervention and the majority of participants agreed that it would be especially useful for older people living alone, or those older adults who have problems understanding or taking their medications and managing their diabetes. Findings in the literature support the study participants' perspective that healthcare support and socio-emotional support were significantly linked to healthy behaviors and positive outcomes for older adults living with diabetes (Durso et al., 2003; Gambling & Long, 2006; Westway, Seager, Rheeder & Van Zyl, 2005).

For participants in the intervention group, improved scores on the PAID and GDS questionnaires plus improved self-reported glycemic control from T1 to T2 confirm findings by Polonsky et al. (2003) that nurse follow-up by telephone may be effective in terms of improved mood, motivation and healthy behaviors which may in turn be positively associated with glycemic improvement. It should be mentioned here that the usual care group were not asked about their blood glucose values. As noted in the results section, the usual care group also showed improvement in depression scores, but the intervention group had more room to improve and showed greater improvement.

Westway et al. (2005) propose that the right support at the right time makes fundamental sense to the lives of people with diabetes, and this type of support must have two predominant dimensions, emotional support and "tangible" or practical support. Caring relationships and practical assistance provided by health professionals are necessary for the health, well-being and day-to-day self-management of diabetes, especially for older adults.

Additionally, Lustman and Clouse (2002) state that a “singular” focus on diabetic education fails to address depression and low mood in individuals with diabetes. The hardships of diabetes management require support with coping skills to enhance adherence to medications and encourage weight loss and healthy behaviors because the negative burden of depression in diabetes is daunting (Polonsky et al., 2003). This was evidenced by the responses to the weekly questions during the study intervention. Participants receiving weekly contacts from the nurse were occasionally weeping or distressed by their inability to cope with perceived difficulties and frustrations in their daily lives, such as diet, weight gain, pain, sleep disruption, glucose monitoring and fragmented healthcare resources. In agreement with these research findings, previous studies have indicated that activities of daily life are impaired by physical and emotional disturbances of living with diabetes, especially for the older adult (Wandell & Tovi, 2000) and that emotional and mood disturbances in elderly diabetic people may be a complication related to the disease itself (Flack & Yue, 1995; Wandell & Tovi, 2000).

An additional outcome from this study supported findings from the literature by showing that nurse telecare monitoring may be effective in improving glycemic control and enhancing adherence to blood glucose monitoring (Durso et al., 2003; Izquierdo, Knudson, Meyer & Kearns et al., 2003; Kinsella, 2001; Piette et al., 2001; Wong, Mok, Chan & Tsang, 2005).

The usual care group were not asked about their blood glucose levels therefore results regarding self-monitoring of blood glucose values for this group cannot be reported. However, all intervention group participants receiving the nurse telephone monitoring reported increased awareness and motivation regarding self-monitoring of blood glucose. At

12-weeks, nine people (65.3%) in the study intervention group reported a fasting blood glucose level in the normal range of 4.2 - 6.0 mmol/L, which was an improvement over baseline, when no subjects in the intervention group reported blood glucose levels in this range. This may suggest that improvements in knowledge and awareness were translated into behavior changes. However, it may also have to do with participants using more reliable glucometers. Three individuals in the intervention group obtained new glucometers to be sure their blood glucose readings were accurate, two people did not know that their glucometers had batteries that needed to be replaced and two participants did not know how to calibrate their glucometers. The researcher encouraged them to take their glucometers to a local pharmacist who explained how to calibrate their glucometers and they reported their glucometer reading no longer showed intermittent “Hi” or “Error” values.

These findings regarding improved blood glucose levels are consistent with findings by Durso et al. (2003) in a 12-week study among older adults (mean age 78.43 years) using cellular telephones for diabetes management. Durso et al. reported that four of the study participants (N=7) reported decreased HbA1c (glycosylated hemoglobin) levels after the 12-week intervention and all participants reported satisfaction with the nurse telephone monitoring intervention and valued the prompts and educational messages to reinforce self-care behaviors and diabetes knowledge.

Discussion and clarification of blood glucose values was important to all 15 participants receiving the nurse-telecare intervention in this study. This finding is consistent with results from a study by Piette et al. (2001) where participants (mean age 61 years) discussed blood glucose monitoring 60% of the time during telephone contacts with a nurse and increased the frequency of monitoring their blood glucose levels.

As stated by Funnell and Anderson (2004), people need to know and understand diabetes and its management, as well as their own goals, values and feelings. Misunderstandings and frustration concerning self-management of diabetes were common among participants in this study. The nurse telecare intervention was able to direct information and support to the participant's own understanding of their illness, and this may have encouraged empowerment and confidence for those people in the intervention group. A common frustration expressed among most participants was the lack of resources, services and educational material regarding their diabetes. Participants said that this was exasperating, especially when the family doctor or healthcare provider was insensitive to their dilemmas and they were too intimidated to ask questions because they were afraid of seeming incompetent.

Frequently reported problems by participants in this study were consistent with findings in the literature such as: (a) lack of knowledge of a specific diet plan, (b) poor understanding of a plan of care and (c) helplessness and frustration regarding glycemic control and self-management at home (Brown et al., 2004; Holmstrom & Rosenqvist, 2005; Karlsen et al., 2004; Nagelkerk, Reick & Meengs, 2006; Pouwer et al., 2005). Participants in the intervention group identified that discussing their illness with a nurse and independently solving problems and setting goals was helpful. Having a supportive person who gave encouragement and assistance was meaningful for many participants who could reflect on their healthcare behaviors and develop a positive attitude.

There was a recurring theme for all intervention group participants that social support was important in promoting problem-solving and reducing stress and anxiety. Naglekerk, Reick and Meengs (2006) suggested those with strong social networks and supportive

families often had a more proactive attitude toward diabetes self-management and a perceived better quality of life.

During the weekly telephone calls, participants in the intervention group who reported strong family support networks tended to be more vocal about problem solving and finding strategies to manage their health, such as organizing family members to take them to purchase a walker or help with organizing meals-on-wheels. These findings also substantiated previous research regarding the relationship between positive support and improved health and well-being (Karlsen et al., 2004; Nagelkerk et al., 2006; Treif et al., 1998; Talbot & Nouwen, 2000). Likewise, Trief et al. (2003) added that maximizing coping skills and social resources might act as a “buffer” to help older adults cope with the demands of diabetes care, thus reducing emotional distress and increasing perceived quality of life.

Participants mentioned little about their exercise habits. The majority rarely, if ever engaged in regular exercise. When asked about this, most agreed that regular exercise was challenging and not a priority and preferred to think about diet management, medication regimes, healthcare providers and support networks which seemed more important. More assistance with appropriate exercise routines could benefit older people, especially those with a history of falls and a fear of falling (Nagelkerk, Reick & Meengs, 2006).

Consistent with the findings of Gallo and Rabins (1999) feelings of fear and helplessness were expressed frequently during the weekly telephone calls with the intervention participants. Fears of not understanding glucometers and feeling incompetent, not understanding diabetes, fear of falling and the fear of not being able to manage alone were common. Anderson et al. (2001) suggest that continued feelings of helplessness and frustration can lead to ineffective coping such as denial, indifference and depression.

Effective healthcare providers should not only validate clients' feelings but also screen for depression (Rubin et al., 2000). Nagelkerk et al. (2006) suggest that appropriate treatment of depression among people with diabetes will result in improved diet, exercise, support networks, and physiological outcomes, and that "anticipatory discussion" of frustration, irritation and depressive symptoms may be the first step to help individuals avoid clinical depression.

Goldney et al. (2004) found that the effect of depression on quality of life for people with diabetes was greater than the effect of diabetes alone on quality of life. This was demonstrated in this study by participants in the intervention group whose thoughts about death and dying were frightening, disturbing and distressing, contributing to sleeplessness, depressed feelings and perceived poorer quality of life. When asked to talk about these feelings most participants stated that they did not know why these thoughts persisted and one participant reported she could not understand why she was constantly thinking about death and dying and said it "drove me crazy" especially at night because "I did not know if I would wake up the next day". In addition, participants in the intervention group expressed that sleep disturbances were common; consequently, they were tired during the day. These reports from the study participant's support the findings by Wandell and Tovi (2000) that sleep disturbances in older adults (aged > 65 years) with diabetes are frequent, and mainly due, in part, to pain or nocturia (night-time frequency of urination) caused by elevated glucose levels.

It is worth mentioning here that 21 (75.1%) of participants in this study reported chronic pain at baseline. During the telephone intervention, 8 (53.3%) of the 15 participants receiving weekly telephone calls regularly reported depressive symptoms that they related to

pain. Some participants stated that chronic pain negatively affected their mood, or they would cry or weep during the telephone calls because of pain. The symptom of pain as a characteristic of diabetes has long been recognized in the literature (Damsgaard, 1989; Morely, Mooradian, Levine & Morely, 1984; Tovi & Engfeldt, 1998; Wandell & Tovi, 2000). It is explained by a lower pain threshold in people with diabetes as a direct consequence of hyperglycemia (high blood glucose values) resulting in a decrease in the ability to tolerate pain (Morley et al., 1984; Wandell & Tovi, 2000). During the weekly telephone intervention participants often asked questions about pain medication, and if analgesics (such as Tylenol) could be taken with other medications.

As previously mentioned, participants also inquired about available resources such as where to find diabetes education information, how to find stores that would deliver groceries or medications, how to buy a walker and where to find affordable professional foot care. Polonsky et al. (2003) suggested that the role of the nurse as a case manager in providing ongoing follow-up telephone contact and ensuring continuity of care appeared to be important for people with diabetes to be able to integrate medical management and diabetes self-management into their lives successfully. In agreement with these findings, the 15 participants receiving the telecare intervention in this study stated that on-going follow-up contact with the nurse was meaningful and helped them express their feelings, understand their illness, and find community resources for help and education when they needed it. Likewise, Wong et al. (2005) suggested that successful nurse telephone follow-up interventions regarding continuity of care for people with diabetes seem to incorporate common features similar to a case management approach, consisting of “four Cs”: comprehensiveness, continuity, coordination and collaboration.

Findings from this study and previously mentioned studies (e.g., Gambling and Long, 2006) examining a nurse-led telecare intervention among diabetes patients, found that nurses' advice, positive reinforcement and practical and "emotional information-based support" uniquely tailored to each individual acted as motivation for people to think about positive health-related behaviors.

Nagelkerk et al. (2006), reported that limited social support, knowledge deficits, lack of a specific plan of care and lack of client and health provider mutual goal-setting and problem-solving behaviors contribute to poor self-management of illness for people with type 2 diabetes. What this study adds to these findings are the perceptions of older adults with type 2 diabetes in terms of support, diabetes-related coping and psychological well-being, and how developing a collaborative relationship with a nurse through the telecare intervention enabled them to talk about their diabetes and learn from the discussion. By sharing their concerns, participants were able to reflect on the meaning of illness from their unique perspectives and problem-solve with the nurse to manage the multiple decisions required for optimal care of their health. This approach may have decreased stress, improved mood and motivated participants to maintain a positive attitude to manage their health effectively. These results possibly suggest some direct or partial effects of professional support on well-being.

The dimensions of support reported by the participants in this study were (a) appropriate social support, (b) knowledge and information about diabetes, (c) the integration of medical management and self-care, (d) understanding and planning self-care, and (e) goal setting. These findings are comparable to those reported in a study examining dimensions of support among mixed-age adults with diabetes (Karlsen & Bru, 2002). Identifying the factors

which influence the physical and psychological well-being of older adults with diabetes could be of future interest to healthcare providers to facilitate adaptation and positive outcomes among older adults living with diabetes or chronic illness.

Limitations and strengths

The small study sample may not reflect a representative sample of older individuals with diabetes; thus, there is an inability to generalize results to a larger population. Due to the slow recruitment for the study, sample size was limited, and because of this, the quantitative results cannot be interpreted as clinically significant. To be clinically significant, 60 participants were required for the study (30 in each group) therefore the small sample size reduced the power of the study.

Those who voluntarily participated in the study may have been motivated to actively learn more and improve their health and mood. In terms of the GDS and PAID scores, the intervention group had higher scores and more room to improve and may have been more unwell than the usual group. It is not known what healthcare services the usual care group required during the 12-week study. Furthermore, blood glucose values were self-reported by the intervention group participants, blood samples were not obtained to check glycosylated hemoglobin, the accepted indicator of diabetes control. Blood glucose values were not obtained from the usual care group at 12 weeks to detect any differences in glycemic control in this group from baseline. The effect of the outlier in the intervention group allowed for a large difference in the GDS scores at baseline. However, when the outlier was excluded from the intervention group, the GDS score result at Time 2 remained significant. For the usual care group, the GDS and PAID scores also showed non-significant improvement and were

lower at Time 2, and the type of care that this group received other than usual family physician visits was not known.

The researcher asked each participant in the intervention group the four questions about their opinions with the telecare intervention at the completion of the study. This may have introduced bias into participant's opinions and responses as they had spoken to the researcher weekly for 12 weeks during the intervention. Participants ranking what they found effective regarding the telecare intervention could have strengthened the study. However, results may be clinically meaningful as the study did provide preliminary evidence that nursing support and the telecare interventions may contribute to the physical and psychological well-being of the older person living at home self-managing their diabetes; evidenced by improvement in the intervention group in the GDS and PAID scores from T1 to T2.

CHAPTER 6

Conclusion

Findings from this study illustrate the challenges of the physical and psychological effects of diabetes on the lives of older adults living in Southeastern Ontario. As Canadians age and the numbers of people with diabetes increase, more demands on health services and health providers are likely to emerge. It will become essential for healthcare planners to develop and implement programs to address the mental and physical needs of the older population, especially those with chronic disease. Furthermore, preventing and addressing diabetes through ongoing health education will need to be a public health priority for all ages.

This study has explored the potential application of a nurse telecare intervention among community-dwelling older adults with type 2 diabetes and how the effects of a nurse telecare intervention may improve healthcare delivery for older adults. This method of healthcare support may be an appropriate link to older adults with diabetes and assist with their concerns regarding how they must evaluate themselves, decide what actions to take, and perform these actions. By helping older adults improve performance of appropriate self-care activities, it may be possible to reduce depressive symptoms and diabetes-related stress in this population.

The conceptual framework for the study was Watson's Theory of Human Caring. The recognition and importance of experiences and understanding the wholeness of the person rather than the label of illness or disability is a caring factor of Watson's theory (Watson, 1979). An area of inquiry identified in the literature by Smith (2004) demonstrates that Watson's theory is linked to the significance of subjective experience and caring practices developed from the nurse-client relationship. As shown in this study and according to Smith

(2004), the nursing care-partnership model derived from Watson's theory demonstrates that patient-nurse care partnerships encouraged personal growth and facilitated teaching and learning for the nurse and the client. Consistent with Watson's theory, nurse caring partnerships are viewed as supportive for clients and construct of new methods of communication to strengthen the nurse-client bond (Smith, 2004).

Concurring with Watson's theory all participants in the intervention group agreed that communication with a nurse was meaningful for them because talking and learning about their health was important. Westaway et al. (2005) point out that for people with diabetes the provision of assistance within a caring relationship is essential for their health and well-being, especially for older adults with diabetes who have poorer health and lower social support than younger individuals with diabetes.

This study has provided insight into how older adults with diabetes perceived regular telephone communication with a nurse and how this support may have positively affected their mood, decreased diabetes-related stress and raised awareness of healthy behaviors. Additionally, the study has illustrated the relevance and importance of continuity of care by nurse follow-up for older adults with diabetes and the necessity to target interventions, education and support to each individual's unique needs.

Older adults with complex health issues regularly depend on ongoing support from healthcare professionals (Gambling & Long, 2006). This was demonstrated in this study by the nurse telecare intervention; participants receiving telephone calls from the nurse demonstrated a greater decrease in depressive symptoms and diabetes related stress (compared to the usual care group), and appeared to be receptive to telephone care and increased satisfaction with care. Likewise, participants receiving the telecare intervention

said they felt comfortable talking to the nurse by telephone and the lack of face-to-face visits or physical contact and concerns about privacy were not mentioned as an issue for any of the participants. All participants in the intervention group indicated they would recommend the telecare intervention and would participate in a similar study again.

As evidenced by Izquierdo et al. (2003) and this study, diabetes education and support by telephone reduces diabetes-related stress and may lead to greater motivation, higher morale and improved psychological adjustment to living with a chronic illness such as diabetes. Talking to participants in the intervention group regularly and enhancing communication with a nurse allowed the nurse to deal with problems such as understanding and calibrating glucometers. These problems were addressed much sooner than they would have been addressed through traditional care.

From a nursing perspective, regular communication with participants enhanced the nurse-client relationship, consistent with Watson's theory. By communicating with participants and identifying problems promptly such as concerns about abnormal blood glucose values, assisting with the decision to obtain a glucometer and finding appropriate community and healthcare resources, the nurse and client relationship became the agent of change to reflect on healthcare behaviors and promote positive health outcomes.

CHAPTER 7

Implications for clinical practice

Participants in the intervention group may have received some diabetes education in the past, but could not readily recall it. This study identifies that reinforcement may be important in the retention of knowledge. Although the capacity to learn and integrate new information remains intact throughout the life-cycle, nurses should perform an individualized learning-needs assessment for older adults with diabetes (McCloskey, 2005).

Findings from this study show that over the long term it is common for older individuals to have difficulty managing the daily self-care demands of diabetes such as coping with self-monitoring of blood glucose or understanding medication or diet restrictions while continually striving to maintain optimum health status. Therefore, it is not surprising that the stress of coping with diabetes is a major risk factor for depression.

With limitations in resources and healthcare services, there is a trend to shift the management of chronic disease to the community setting and this study shows that the nurse telecare model of care could result in improved physical and psychological outcomes for older people living at home. As evidenced by this study, the use of telephone monitoring has the potential for integration into current healthcare services, providing healthcare support to many individuals in the community with minimum disruption for clients.

For older adults with complex health problems, Watson's Theory of Caring emphasizes the unique humanistic conceptualization of individuals that is necessary for building a caring relationship. Within this relationship, the client and nurse create new ideas and problem solve together and move the individual's healthcare plans forward allowing progress to take place. Furthermore, Watson identifies the creative, reflective use of problem

solving as a caring factor. The reflective use of mutual problem solving in this way (nursing process) guides the clinical assessment, the nature of planning and the course of actions (Falk Raphael, 2000). Thus, when reflecting on their health, participants in this study described how the constructs of respect, empathy and expertise regarding health care providers were of vital importance to them. These constructs were essential to those who were ready to make lifestyle changes.

Watson's Theory of Caring is congruent with nursing the older individual and validating their perception of health and illness. Nurses play a key role in care of the elderly, therefore a telecare nursing assessment using the Geriatric Depression Scale and the PAID questionnaire (which take only three to five minutes to administer) may identify depressed mood and diabetes-related stress in older adults. This type of assessment and screening may reduce the risk of mental and physical decline among older adults and encourage positive health behaviors. Likewise, nurse telecare can be implemented quickly with minimum disruption for clients, yet it presents an opportunity for a structured yet individualized clinical assessment of the client's needs and progress (Meresman et al., 2003).

Additionally, emerging evidence suggests that depression itself may be a risk factor for the development of type 2 diabetes (Freedland, 2004). When a nurse suspects psychiatric problems, it is helpful to encourage the person to express his or her feelings or screen for depression because the interaction of diabetes and depression may be seen as "non-compliance" by health professionals (Goebe-Fabbri & Zrebiec, 2005).

A better understanding of behaviors related to chronic disease could lead to improvements in disease prevention, education and care of older adults. In gerontological nursing how older adults perceive wellness is important in formulating care plans. However,

wellness begins with the client's independent decision-making in his or her own plan of care (Gress, 1984). For older adults, health is a highly complex concept. It is more than the absence of disease; therefore, screening older adults with and without diabetes for mood disorders and counseling them about health and wellness behaviors should be integrated into every interaction between older adults and their health care providers to potentially lower the rates of morbidity and mortality related to chronic diseases in the later years (Gress, 1984; McGuire, Strine, Okoro, Ahluwalia & Ford, 2007).

CHAPTER 8

Recommendations for future research

To expand findings from this study, future studies could focus on how issues of communication and personal identity are central to explanations of older adults' experiences (Radley, 1994) and how this influences management of their diabetes. Linked closely with communication is the focus of health professionals' perceptions of patient empowerment and its influence upon the delivery of their care (Cooper, 2003). Responses from the intervention group in this study regarding the telecare intervention indicated that their perceptions of what they found helpful is probably a vital component relating to whether or not people engage in activities to manage their health. Therefore, asking older adults what is important to them to be able to manage their health would be important for future research.

This study may have highlighted that patient education and support regarding chronic illness is difficult to achieve in the long term without creating a working partnership between the health care provider and client. Outcomes from this study illustrated that living with a chronic disease created special circumstances between a patient and healthcare provider, when feedback and shared decision-making is significant to achieving positive outcomes. Future research, using an educational and empowerment intervention to focus on communication strategies that older individuals value may help nurses and clients understand the complexities of self-management of chronic illness. This may produce guidelines for new ways of communicating to enhance the nurse and client relationship. For nursing practice, this approach could encompass a learner-centered approach by using personal experience as likened to personal expertise.

The Public Health Agency of Canada (2006) reports that family members and friends provide 75% to 85% of care for seniors with chronic illness living in the community. Responses from this study indicated that health professionals need to become aware that care for the older person with a chronic illness has a different social perspective than care for acute illness. With the current healthcare emphasis on developing “expert patients” (Childs, Cypress & Spollett, 2005) who can self-manage their diabetes the need for family education and collaborative care for older adults is essential, particularly with the rising prevalence of diabetes. Future research involving multidisciplinary health care providers may be useful to explore wellness strategies for group and family-based education, such as peer support groups, exercise and walking programs, or skills training and self-reflection techniques to assist older adults integrate diabetes management into their lives.

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Appendix A

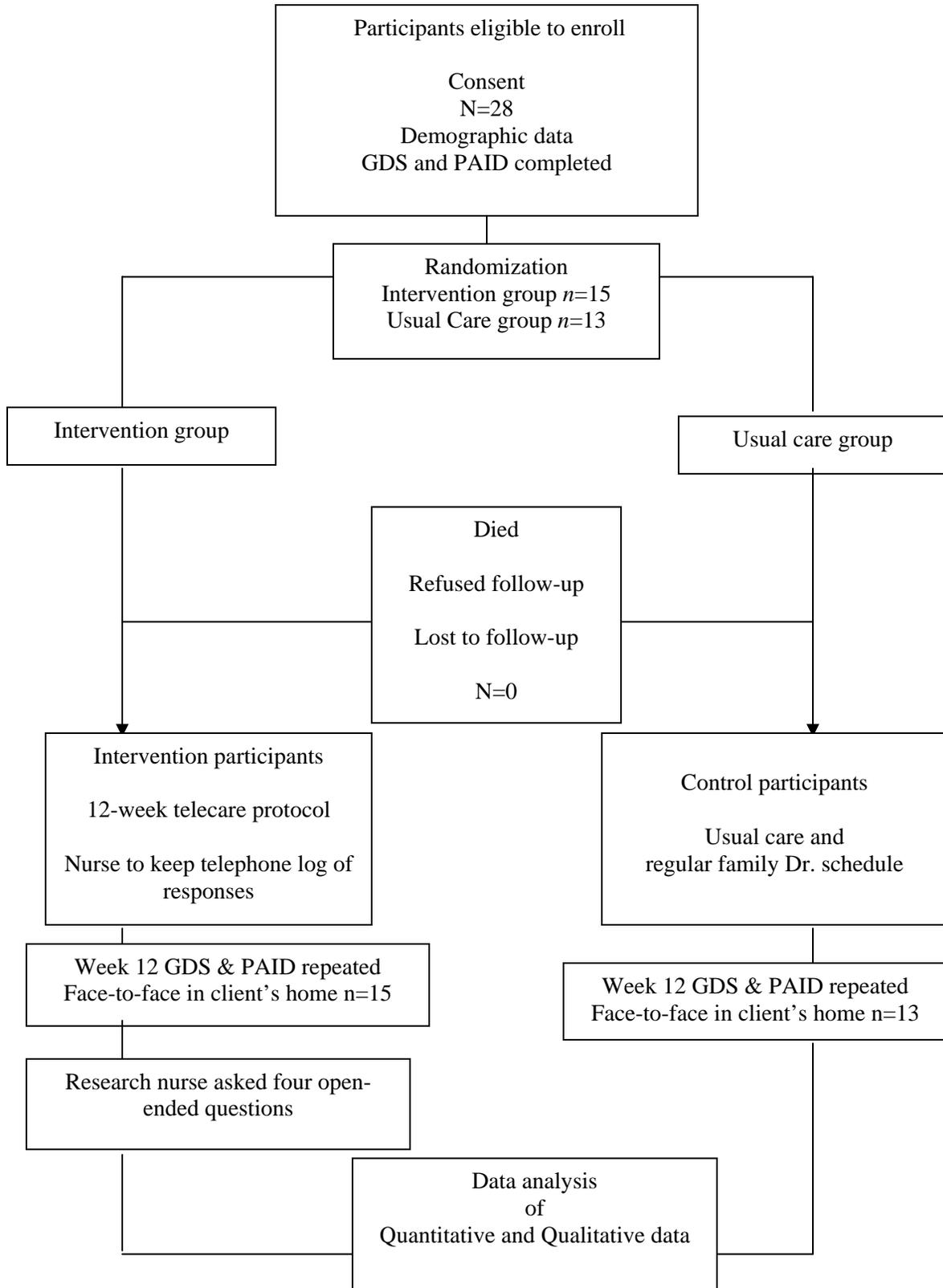
Diagnostic and Statistical Manual of Mental Disorders Fourth Edition

American Psychiatric Association (2000)

Criteria for Major Depressive Episode	Criteria for Dysthymia
<p>Duration: Most of the day for at least 2 weeks</p> <p>Five or more symptoms of the following; one of which is either depressed mood or loss of interest or pleasure.</p> <p>Depressed mood, sad or “empty”</p> <p>Loss of interest or pleasure</p> <p>Significant gain or loss of appetite & weight</p> <p>Insomnia, difficulty sleeping, or hypersomnia</p> <p>Psychomotor agitation or retardation</p> <p>Fatigue & loss of energy</p> <p>Feelings of worthlessness and inappropriate guilt</p> <p>Unable to think & concentrate</p> <p>Recurrent thoughts of death or suicide</p>	<p>Duration: Most of the day for at least 2 years</p> <ul style="list-style-type: none"> ○ Chronically depressed mood. ○ Feeling “down in the dumps”, may be irritable rather than depressed. ○ At least 2 of the following are present. <p>Irritability</p> <p>Loss of interest</p> <p>Poor appetite or overeating</p> <p>Insomnia or hypersomnia</p> <p>Low energy</p> <p>Low self esteem</p> <p>Poor concentration</p> <p>Difficulty making decisions</p> <p>Feelings of hopelessness</p> <p>Self-criticism</p> <p>Social withdrawal</p>

Appendix B

Flow chart to show working framework and participant follow-up for the study



Appendix C

Participant Information and Consent Form

In many community settings, nurse telecare (nurse telephone call monitoring) has been shown to increase nurse/patient communication and improve client health and satisfaction with care. This study is to assess if the effects of nurse telecare improves health outcomes for older adults who have diabetes and may have symptoms of depression. Many older people with diabetes often feel down or depressed and we think it is worthwhile to explore the relationship between the two health concerns of diabetes and mood. You are being asked to volunteer to enroll in a study of persons 65 years of age and older, living in Southeastern Ontario who have been diagnosed with diabetes and may also feel depressed or have low mood.

There will be 2 groups in the study. If you agree to participate, you will be assigned by chance to one of two groups. Group 1 will receive a 20-minute telephone call each week for 12 weeks, from a research nurse who will ask questions about their health. Group 2 will be under the usual routine care of their family physician. All participants will be requested to complete 2 questionnaires regarding depression and stress, at the 1st and 13th week of the study. At the end of the 12-week period, a final interview will be arranged with all participants to repeat the questionnaires from the first interview.

Appendix C continued

Those participants who are in the intervention group and receive telephone calls from the research nurse will be asked for their responses about the telecare nurse monitoring at the end of the study.

This is a confidential study, which means that the people who are doing the research will not reveal your personal information to anyone and only group data will be reported. Your identity will be known only to the nurse and her research advisor and will not be revealed at any time. Participation in this study is voluntary. You may withdraw from this study at any time.

There are no risks or costs to persons who participate in this study. By completing this study, you are simply giving the researchers permission to use the answers from your survey in a nursing research study. You may benefit from talking on the telephone each week for 12 weeks with the study nurse. If you live outside the local area, there will be no long distance telephone charges for you, as the study nurse will contact you by telephone at a pre-arranged time.

If you have questions about this study or concerns about participation, please contact

Angela Jodoin or Dr Diane Buchanan at 613-533-6000 ext 78907, OR

Dr Albert Clark, Chair, Research Ethics Board, Queen's University at 613-533-6081.

Thank you for participating

Appendix C continued

Consent

I have received a copy of this information sheet and agree to participate in the 12-week study to explore the relationship between diabetes, and depression; and if the addition of nurse telecare further improves health outcomes. I have been assured that my participation is voluntary, and that my identity will not be revealed during presentation or publication of the study results.

Signature of Participant _____

Date _____

Signature of Witness _____

Appendix D

Socio-demographic data

M__ F__ AGE____ DOB_____ EDUCATION_____

MARRIED____ SINGLE____ WIDOWED____ DIVORCED____ OTHER_____

LIVES WITH_____

LANGUAGE_____ RETIRED____ EMPLOYED_____

HOW LONG DIABETIC_____ DIET_____

TOBACCO USE_____ ALCOHOL USE_____

CAREGIVER_____ CAREGIVER SERVICES_____

OTHER MEDICAL CONDITIONS_____

USE OF HEALTHCARE SERVICES_____

FREQUENCY OF DOCTOR'S VISITS_____

NUMBER OF HOSPITALIZATIONS IN PAST YEAR_____

CONTINENCE_____ PAIN_____

NUMBER OF PRESCRIPTION MEDICATIONS_____

NUMBER OF NON-PRESCRIPTION MEDICATIONS_____

INDEPENDENT WITH MEDICATIONS_____

FUNCTIONALLY INDEPENDENT_____

WALKS WITH WALKING AID_____

VISION_____ FOOTCARE_____

DRIVING_____ TRANSPORTATION_____

INDEPENDENT WITH ADL'S/BANKING/SHOPPING_____

SELF-MONITORING BLOOD GLUCOSE_____ FASTING BS TODAY_____

Appendix E

Geriatric Depression Scale

Yesavage, Brink, Rose, Lum, Huang, Adey, and Leirer, (1983); Hoyle et al., (1999).

Name: _____ Client Number: _____

- 1. Are you basically satisfied with your life? YES **NO**
- 2. Do you often get bored? YES **NO**
- 3. Do you feel helpless? YES **NO**
- 4. Do you prefer to stay at home rather than going out & doing new things? YES **NO**
- 5. Do you feel pretty worthless the way you are now? YES **NO**

Answers in **BOLD** indicate depression.
For clinical purposes a response in bold of 2 or more on the above questions is suggestive of depression and indicates need to complete all 15 questions.

GDS SCORE
/5

- 6. Are you in good spirits most of the time? YES **NO**
- 7. Are you afraid that something bad is going happen to you? YES **NO**
- 8. Do you feel happy most of the time? YES **NO**
- 9. Do you feel that your life is empty? YES **NO**
- 10. Have you dropped many of your activities and interests? YES **NO**
- 11. Do you feel you have more problems with memory than most? YES **NO**
- 12. Do you think it is wonderful to be alive? YES **NO**
- 13. Do you think that most people are better off than you are? YES **NO**
- 14. Do you feel full of energy? YES **NO**
- 15. Do you feel that your situation is hopeless? YES **NO**

GDS SCORE
/15

DATE _____ LOCATION _____ CLINICIAN _____

Appendix F

Problem Areas In Diabetes (PAID) Questionnaire

INSTRUCTIONS: Which of the following diabetes issues are currently a problem for you?
Circle the number that gives the best answer for you. Please provide an answer to each question.

Not a Minor Moderate Somewhat Serious Serious
problem problem problem problem problem

Not having clear and concrete goals for your diabetes care?01 2.....3.....4

Feeling discouraged with your diabetes treatment plan?0.....1.....2.....3.....4

Feeling scared when you think about living with diabetes?0.....1.....2.....3.....4

Uncomfortable social situations related to your diabetes care?..... 0.....1.....2.....3.....4
(e.g., people telling you what to eat)

Feelings of deprivation regarding food and meals?0.....1.....2.....3.....4

Feeling depressed when you think about living with diabetes?0.....1.....2.....3.....4

Not knowing if your mood or feelings are related to your diabetes? 0.....1.....2.....3.....4

Feeling overwhelmed by your diabetes?0.....1.....2.....3.....4

Worrying about low blood sugar reactions?0.....1.....2.....3.....4

Appendix G

Scoring the Problem Areas In Diabetes (PAID) Scale

The PAID is a measure of diabetes-specific emotional distress that was developed by the Joslin Diabetes Center, Boston. It was written originally in US English, but has later been translated into Spanish, Japanese, Dutch, German, Chinese, Croatian, Danish, and Portuguese.

The PAID total score ranges from 0 to 100. This scoring approach is similar to that used by other well-established measures such as the SF-36 quality of life measure. It is common for measures to be converted from raw scores to a 0-100 scale to make them more easy to work with and understand.

The 3 steps to scoring the PAID are as follows:

1. There are 5 response options available for each PAID question. These responses are given a value from 0-4 as can be seen from this example taken from the PAID questionnaire:

Not having clear and concrete goals for your diabetes care?				
Not a problem	Minor problem	Moderate problem	Somewhat serious problem	Serious problem
0	1	2	3	4

2. Sum the total obtained for all of the 20 PAID items
3. Multiply this total by 1.25 to produce a total score that ranges from 0-100

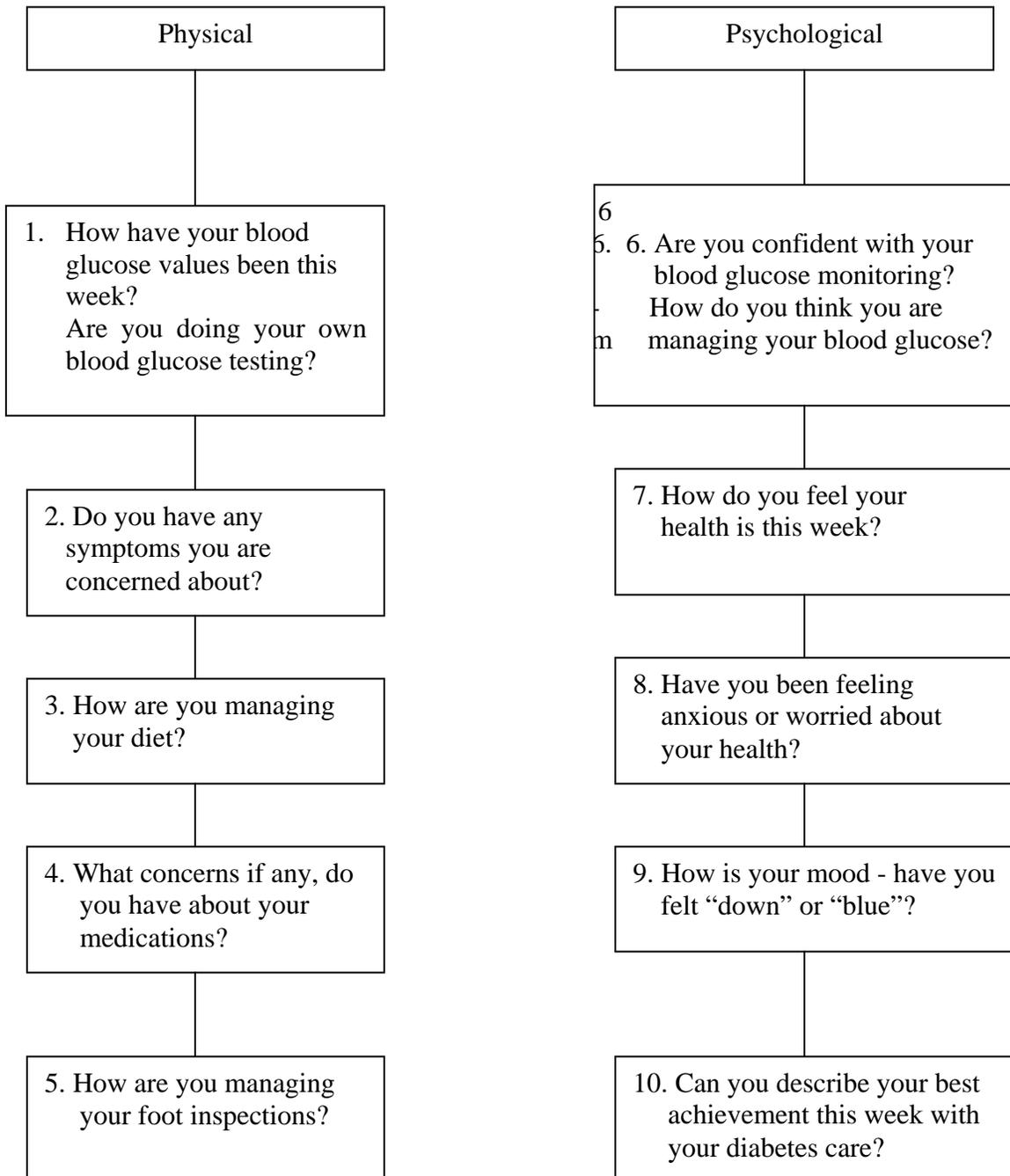
For example, if the sum of 20 PAID item scores is 40, this is multiplied by 1.25 to get a final PAID score of 50 on a range from 0-100

If you have any questions about scoring the PAID please contact Dr Garry Welch at this email address: Garry.Welch@Joslin.Harvard.edu

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Appendix H

Key questions for nursing assessment weekly phone calls (telecare intervention) based on studies by Piette, Weinberger, Kraemer, and McPhee (2001) and Walsh and Coleman (2005).



Appendix I

Final interview questions for thematic content

(Bowles & Dansky, 2002; Kim, Oh & Lee, 2005; Piette et al., 2001; Durso, et al., 2003).

1. “How did the nurse telecare participation help you with your healthcare problems?”
2. “How could this type of communication with a nurse help you in the future?”
3. “What was the most important aspect of the nurse follow-up telephone calls for you?”
4. “Would you recommend nurse telecare to your friends and family, and if so can you tell me why?”

Appendix J

Table 5

Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
T2 GDS – T1 GDS	Negative Ranks	5 ^a	4.10	20.50
	Positive Ranks	2 ^b	3.75	7.50
	Ties	9 ^c		
	Total	16		
T2 PAID – 1 PAID	Negative Ranks	8 ^d	7.19	57.50
	Positive Ranks	3 ^e	2.83	8.50
	Ties	5		
	Total	16		

a. T2 GDS < T1 GDS

d. T2 PAID < T1 PAID

b. T2 GDS > T1 GDS

e. T2 PAID > T1 PAID

c. T2 GDS = T1 GDS

f. T2 PAID = T1 PAID

Appendix J

Table 5 continued

Wilcoxon Signed Ranks Test

Test statistics^b

	T2 GDS – T1 GDS	T2 PAID – T1 – PAID
Z	-1.109 ^a	-2.180 ^a
Asymp. Sig. (2-tailed)	.27	.02

a. Based on positive ranks

b. Wilcoxon Signed Ranks Test

Descriptive Statistics

	N	Mean	Standard Deviation	Minimum	Maximum
Time 1 GDS	28	3.32	3.92	.00	13.00
Time 1 PAID	28	17.49	19.27	.00	85.00
Time 2 GDS	16	1.75	2.17	.00	6.00
Time 2 PAID	16	9.20	6.93	.00	25.00

Appendix K

Effective strategies identified by telecare participants to help facilitate their health
management

1. Developing a collaborative relationship with a nurse or healthcare provider.
2. Being able to access healthcare resources when needed.
3. Attaining adequate resources for self-management of their health.
4. Understanding glucometers are more than routine practice, but a tool for healthy eating.
5. Maintaining a positive attitude that prompts and motivates learning.
6. Establishing routine meal times and medication times.
7. Having a supportive person to give encouragement and assistance when needed.
8. Ongoing education and discussion to talk and learn about their health management.