The Effect of a Chronic Disease Self-Management Program on Symptom Management of Older Adults with Type 2 Diabetes

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To the Faculty of Washington State University:

The members of the Committee appointed to examine the clinical research project for BEVERLY FOGARTY find it satisfactory and recommend that it be accepted.

Chair

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[Signatures]
Abstract

The World Health Organization estimates chronic disease will be the leading cause of disability by 2020. Rising healthcare costs and reductions in services and resources necessitate developing more cost effective methods for managing chronic illness. Patient centered self-management programs teach individuals to better manage and care for chronic illnesses resulting in improved health outcomes and reduced costs. The purpose of this analysis is to evaluate the impact of the Chronic Disease Self-Management (CDSMP) program on symptom management in older adults with type 2 diabetes. The Interaction Model of Client Health Behavior guided the prospective treatment-control intervention study.

Participants in this study showed little change in reported self-efficacy for managing chronic disease, ratings of self-perceived health status, or use of cognitive symptom management techniques. However, the use of visualization as a cognitive symptom management technique increased significantly among intervention participants following the CDSMP. Intervention participants continued using visualization to a greater extent than the control group for at least 4 months after the CDSMP. Other researchers have identified many positive outcomes following CDSMP participation. The CDSMP is a theory and evidence-based approach to chronic illness management and, based on available research, useful for enhancing self-management skills, improving outcomes, and reducing health care costs. Where available, the CDSMP should be recommended as an adjuvant to primary care for clients with chronic illnesses. Healthcare system changes, including chronic illness management education and support are critical to providing cost-efficient care and achieving quality outcomes.
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Introduction

As life expectancy continues to expand, so does the prevalence of chronic disease and the associated co-morbidities (Chodosh et al.). The aging of America is triggering a higher demand for health care. At least 80% of older adults have one chronic condition and 50% have at least two (Gerberding, 2006). Because the population will be older and greater in number in the coming years, overall health care costs will increase 25% by 2030. In the United States, treatment costs for asthma, diabetes, and congestive heart disease total about $60 billion annually (White & Roughan, 2000). With aging comes functional impairment. The ability of the nation to respond to the needs of functionally impaired seniors represents one of the major challenges of the twenty-first century (Morley, 1998).

The World Health Organization estimates chronic disease will be the leading cause of disability by 2020, and the most expensive problem faced by healthcare systems unless it is successfully managed (Barlow et al., 2005). Although chronic diseases are among the most common and costly health problems, adopting healthy behaviors such as eating nutritious foods, being physically active, and avoiding tobacco use can prevent or control the devastating effects of these diseases (Center for Disease Control and Prevention, 2006). Arthritis, diabetes, and high blood pressure are common chronic diseases and can be treated but not cured. Medications can help improve symptoms and slow disease progression. However, patients who are more knowledgeable about their disease often have better outcomes than those who rely on drug therapy alone (Chodosh et al., 2005).
Chronic illness self-management support reduces hospitalization, emergency room use, and overall managed care costs (Coleman & Newton, 2005). Self-management support is the process of making multi-level changes in health care systems and the community to facilitate patient self-management (Coleman & Newton, 2005). Self-efficacy, or the patient's belief in his or her own ability to accomplish a specific behavior or achieve a reduction in symptoms, is an underlying theory of self-management education. Increasing patient self-efficacy has led to improved clinical outcomes (Coleman & Newton, 2005). With the rising cost of health care and the reduction of services and resources, the health care community must derive more cost effective measures for managing chronic illness. One method of addressing this problem is by facilitating patient centered education. Self-management programs to teach individuals how to manage and care for their chronic conditions are the foci of promoting self-efficacy and self-care (Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001).

Chronic illnesses management requires extensive patient responsibility, including taking medication, making lifestyle changes and/or undertaking preventative actions. Patients with chronic illnesses make multiple daily self-management decisions (Newman, Steed, & Mulligan, 2004). Self-management is “the individual’s ability to manage the symptoms, treatment, physical and psychological consequences and lifestyle changes inherent in living with chronic a condition” (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002, p. 177). Barlow et al. (p. 177) further state the “ability to monitor one’s condition and to affect the cognitive, behavioral and emotional responses necessary to maintain a satisfactory quality of life” is necessary for successful self-management. Quality of life involves several dimensions and assesses physical, psychological, and social functioning (Coelho, Amorim, & Prata, 2003). Patients with diabetes vary in their perceptions of quality of life and ability to cope with disease-related stresses. A
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distinction exists between quality of life and the patients' ability to manage their symptoms of
their disease. The ability for self-management is affected by the patient's adaptation to the
disease (Coelho et al., 2003). Self-management education can significantly improve self-efficacy
and, in turn, enhance quality of life for patients with diabetes. Self-management education for
patients with diabetes, attempt to provide necessary information and practice to allow patients to
be responsible for their own treatment and disease control (Coelho et al., 2003.).

The Chronic Disease Self-Management Program (CDSMP), developed by Lorig and
colleagues (2001) at the Stanford Patient Education Research Center, has effectively improved
self-management skills and reduced health care costs following patient participation (Lorig et al.,
2001). Diabetes-specific education is necessary for optimal diabetes self-management. However,
most patients with type 2 diabetes have one or more additional chronic health problems. The
evolution of self-management programs has accompanied the trend to move away from a system
in which the health-care professional is the expert and the patient a passive recipient of care. A
collaborative care model with shared expertise between patients and professionals and both
parties working together to achieve the best possible management is increasingly advocated

Three general assumptions guided development of the CDSMP:

1. patients with varying chronic diseases have similar self-management problems and
tasks;

2. patients can learn to take responsibility for the day-to-day self-management of their
disease and;
3. confident knowledgeable patients who practice self-management will experience improved health status and will use fewer health care resources (Lorig, Sobel, & Holman, 1998).

The CDSMP is a 6-week small group intervention attended by people with different chronic conditions (Lorig et al., 2001). Peer instructors generally teach the CDSMP. Peer instructors are people who have participated in the CDSMP and subsequently volunteer to receive training to become an instructor. They facilitate the educational self-management sessions using a highly structured manual (Lorig et al., 2001). Research suggests positive role models increase patients’ self-efficacy or confidence in their ability to manage their disease (Bandura, 1986). Peer instructors provide such role models and are fundamental to the theory-based course emphasizing self-efficacy enhancement, problem solving, decision-making, and confidence building (Lorig et al., 1998).

The purpose of this research was to test the Chronic Disease Self-Management Program’s (CDSMP) effectiveness to improve disease management and health outcomes in a sample of older adults with diabetes who resided in independent living communities (Corbett, 2003).

The analyses reported here specifically addressed the following purposes:

1. Describe chronic illness symptoms, coping strategies, and confidence doing tasks and activities for chronic illness management reported by community dwelling adults with type 2 diabetes.

2. Evaluate the impact of a chronic illness self-management workshop on chronic illness symptoms, coping strategies, and confidence doing tasks and activities for chronic illness management among community dwelling older adults with type 2 diabetes.
Design

A treatment-control, quasi-experimental prospective design was used. Participants recruited for this study were residents of independent living communities in a city in northwestern Washington State. To avoid information sharing between participants living in the same community, independent living communities, instead of individuals, were randomly assigned to intervention and control groups. Matching independent living communities according to the number of residents, age of residents, government subsidized or non-subsidized community, and type of community (apartment or duplex/condominium) was done in an attempt to limit threats to the internal validity.

Recruitment

A list of independent living communities appearing in a local newspaper identified facility names, locations, sizes, and government subsidy status. After matching communities using these criteria, a coin toss determined which community would be the control group verses the intervention group. Twelve independent living communities were enrolled in the study; 6 for the intervention group and 6 for the control group. The number of participants recruited for the intervention and control groups were 47 and 36 respectively (N=83). Recruitment methods included posting flyers about the study throughout the living complexes, writing articles for community newsletters, and obtaining referrals from community leaders. In addition, Corbett, the PI, presented information about the research opportunity at either a residential group meeting or an upcoming event that residents were likely to attend in most of the communities.

The PI contacted and met individually with potential participants in their homes and obtained written consent from those willing to participate. After providing consent, participants completed the first questionnaire and returned it to the research team within one week. The
questionnaire contained a demographic information sheet and several psychosocial instruments including those to measure self-efficacy for managing chronic disease, cognitive symptoms management techniques used and rating of perceived health status. Data was collected at baseline, immediately after the intervention (2 months after baseline), 3 and 6 months after baseline from all participants.

Sample and Setting

The population studied was individuals over the age 60 with a diagnosis of type 2 diabetes residing in independent living communities. To be included in the study, participants needed to be physically able to attend a 2.5-hour group session each week for six weeks. Participants were required to read, write, and understand the English language. To be included in the 2-month, 3-month, and 6-month data collection process, persons in the intervention group had to have attended at least 4 of the 6 Chronic Disease Self-Management Program sessions. Data from participants who did not attend at least 4 of the 6 CDSMP sessions was not included in the final analyses. The intervention of 6 weekly chronic disease self-management workshops was presented in a common meeting area in each residential setting. Holding the group meetings at each residential setting provided easy access and eliminated transportation barriers to and from sessions.

Theoretical Framework

The theoretical framework used in this study was Cox’s Interaction Model of Client Health Behavior (IMCHB). The model consists of three major elements: client singularity, client-professional interaction, and client health outcomes. Client singularity emphasizes the holism and uniqueness of an individual in interaction within his or her own social and physical environment (Cox, 1986). The client-professional interaction element emphasizes the
multiplicity of factors included in intervention, representing and promoting the client to participate in his or her own health care (Cox, 1986). The health outcomes element ascertains clients’ selected health behaviors after participating in certain health services and whether there is progression or retardation of health, disease or functional status (Cox, 1986). Figure 1 depicts how the model guided the analyses reported in this paper.

Instruments

The Self-Efficacy for Managing Chronic Disease 6-item Scale evaluated participants’ confidence doing certain activities. Participants rated their confidence in doing activities to manage illness on a 10-point Likert scale with 1 being not confident at all and 10 being very confident. The scale represents several domains that are common across many chronic illnesses, including symptom control, role function, emotional functioning and communicating with primary care providers (Lorig et al., 2001). The internal consistency reliability of the Self-Efficacy for Managing Chronic Disease 6-item Scale was .91, when tested with a sample of 605 participants with chronic diseases. In the present study, Cronbach’s alpha for the Self-Efficacy for Managing Chronic Disease 6-item scale ranged from .90 at baseline to .95 at the 6-month follow-up assessment. Cronbach’s alpha at the 2 and 3-month follow-up assessment was .94 for both. Participants also completed a self-rated health item using a 5-point Likert scale with 1 indicating excellent health and 5 being poor health. Self-rated health is a component of the National Health Interview Survey and used to predict future health status (Lorig et al., 2001). Test retest reliability was .92 with 51 participants. In this study, test-retest reliability between baseline and the 2 month follow up was .70 for the intervention group and .77 for the control group and test-retest reliability between baseline and the 6-month follow-up (4 months post-
The Effect of intervention was .67 for the intervention group and .55 for the control group (Stanford School of Medicine, 2007).

A 6-item Cognitive Symptom Management questionnaire measured cognitive stress reduction techniques used by participants. Participants rated their use of each technique on a Likert scale ranging from 0 (never) to 5 (always) (Lorig et al., 1998). Intervention participants learned and practiced each technique, including visual imaging; progressive muscle relaxation and positive self-talk, during the CDSMP. Internal consistency reliability of .75 and test retest reliability of .83 has been reported for the Cognitive Symptom Management Questionnaire (Stanford School of Medicine, 2007). In this study Cronbach’s alpha for baseline, 2, 3, and 6-month data times were .83, .80, .85 and .85 respectively.

Results

Participants completed a demographic form to obtain information such as age, gender, years diagnosed with diabetes, and types of comorbidities. Consistent with the independent living community gender mix, the sample was 75.6% female in the intervention group and 80.6% female in the control group. The control group was more ethnically diverse than the intervention group. In the intervention group, 97.8% were Caucasian and 2.2% (n=1) were mixed ethnicity whereas in the control group, 77.8% were Caucasian and 2.8% were black (n=1), 2.8% Filipino (n=1), 2.8% Hispanic (n=1), 5.6% American Indian (n=2), 5.6% Slavic (n=2), and 2.8% mixed ethnicity (n=1) (p<0.01). Participant ages were similar in the intervention group (62-93 years with a mean of 78.6 years) and control group (65-95 years with a mean of 75.9 years) (p=0.12).

Mann-Whitney analysis to determine significant changes before and after the intervention were completed for the Self-Efficacy for Managing Chronic Disease 6-item Scale, self-rated health item, and for each of the six items in the Cognitive Symptom Management questionnaire.
Analyses revealed no significant differences from baseline, 2 months, 3 months, and 6 months for any variable tested with exception of visualization. Intervention group participants consistently reported using visualization to manage chronic illness more frequently at all three follow-up periods (p< .05 for all). ANOVA results confirmed a significant group difference (p< .05) with the intervention group reporting greater use of visualization to manage chronic illness symptoms.

Discussion

Participants in this study showed little change in reported self-efficacy for managing chronic disease, ratings of self-perceived health status, or use of cognitive symptom management techniques. However, the use of visualization as a cognitive symptom management technique increased significantly among intervention participants following the CDSMP. Imagery or visualization refers to “the formation of a mental representation of an object that is usually only perceived through the senses” (Van Fleet, 1999, p.503). Visualization is experienced constantly, consciously and unconsciously, and is involved in most if not all experiences (Van Fleet, 1999). Visualization can be a therapeutic process during which participants invoke a comforting image to connect with psychological processes outside conscious awareness for achieving specific health goals (Watanabe, Fukuda, Hara, & Maeda, 2006). Relaxation using visualization was reported to be effective in symptom management and the reduction of chronic pain (Watanabe et al, 2006). The emotional response to the imagery or visualization rather than the actual image is a major factor in the outcome (Post-White & Johnson, 1991). The use of relaxation and visualization offers potential benefits to patients to reduce side effects of chronic illness and enhance well being and sense of control (Van Fleet, 1999). The findings of the current study
whereby intervention participants reported using visualization significantly more than the control participants, suggests participants found it a useful technique.

Improvements in chronic illness management were minimal in the specific analyses reported here. However, many positive participant outcomes following the CDSMP are reported by others (Bryant, Altpeter, & Whitelaw, 2006). Positive outcomes for participants include exercise, fatigue and sleep management, community resource use, medication use, dealing with emotions or fear, anger and depression, communicating with others, including health professionals, problem-solving and decision-making (Dongho et al., 2003). Self-management for people with chronic disease is now widely recognized as a necessary part of treatment (Dongho et al., 2003). When health-care professionals promote self-management, it is an intervention, just as prescribing drugs and doing operations are interventions (Gray, 2004).

Based on demonstrated effectiveness to improve outcomes and lower health care costs, the CDSMP is promoted in many countries throughout the world, including sponsorship by major health insurance companies in the United States (e.g., Group Health, Kaiser-Permanente) and by government subsidized health care systems in other areas of the world. Chronic disease self-management in the United States, Canada, and the United Kingdom is useful in maintaining and improving patients’ health behavior and health status, while lowering health care utilization through improved self-management skills (Dongho et al. 2003).

It is essential for healthcare providers to promote informed decision-making and facilitate actions designed to improve overall health outcomes (Gray, 2004). Improving the self-management skills of individuals with chronic disease may significantly help address some of the challenges faced by the health systems in the future (Levin-Zamir & Peterberg, 2001). Patient education that incorporates self-management and empowerment has been demonstrated to be
cost effective (Levin-Zamir & Peterberg, 2001). Conveying appropriate self-care information to the patient as a health consumer can reduce the use of health services by 7-17% (Levin-Zamir & Peterberg, 2001). The CDSMP is a theory and evidence-based strategy demonstrated to improve a variety of aspects of chronic illness self-management. In communities where the CDSMP is offered, primary care providers may find it helpful to encourage participation or even prescribe the CDSMP to their clients with chronic illnesses.

Study limitations included the small sample size and the inability to randomize participants individually. Randomization increases the likelihood that participants with various levels of extraneous characteristics are included and dispersed throughout both groups in the study. Delivering the CDSMP to a group at the independent living communities created the risk for participants to share information and course content among themselves and possibly affect the outcome of the study if individually randomized. To minimize the effect of this type of contamination, independent living communities were randomized versus individual participants. Analysis of the demographic data identified a difference in ethnicity between groups, with those in the control group being more ethnically diverse than those in the intervention group. No other identified differences existed between the groups. However, the control group did not receive an alternate time and attention intervention so the Hawthorne effect may have contributed to significant changes in the intervention group. The moral of the Hawthorne effect is that people change their behavior when they think they are being observed, and this principle has wider implications in medicine to describe the improved health of control groups (Gale, 2004). Using convenience sampling reduces the representativeness of the sample to the population. In addition, self-reported questionnaires were used in this study. Problems inherent in this method of seeking information include human error, underreporting symptoms, lower response rate,
The Effect of question misinterpretation, and general lack of control by researchers including knowledge of who actually completed the questionnaire (i.e. the participant or family member or friend).

Conclusion

Promoting health among older adults with chronic diseases is challenging (Carter, 2003). As the cohort of older adults increases, a proactive approach to health through appropriate and targeted health promotion strategies is an effective means of reducing overall health care costs (Carter, 2003). Health promotion includes not only activities that help individuals gain skills to maintain and improve their health by adopting beneficial health behaviors but also community-level programs and policies to improve environments and encourage healthy, safe lifestyles (Bryant et al., 2006). A common barrier to successful self-management is co-occurring chronic conditions (Coleman & Newton, 2005). It remains important not only to examine whether patients are able to adopt self-management behaviors in the long term, but also devise techniques that can lead to long term behavior changes (Newman et al., 2004).

Healthcare providers need to examine where their patients are getting information on disease and self-management, and inform them about the best sources of information available (Levin-Zamir & Peterberg, 2001). The CDSMP is an evidence-based approach to chronic illness management and, based on available research, useful for enhancing self-management skills, improving outcomes, and reducing health care costs. Where available, it should be recommended as an adjuvant to primary care for clients with chronic illnesses. Healthcare system changes that include chronic illness management are critical to cost and quality outcomes. Ongoing research to evaluate effective evidence-based strategies to improve chronic illness self-management and policies to ensure implementation are vital to the on-going health care crisis facing our nation.
References


