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Olawunmi Obisesan Date

Improving Self-Efficacy in Chronically-Ill individuals: A First Look at the Effectiveness of a Chronic Disease Self-Management Program in Southeast Missouri

By

Olawunmi Obisesan

Degree to be awarded: M.P.H.

Executive MPH

Iris Smith, Ph.D., Committee Chairperson	Date
Yvonne Commodore-Mensah, Ph.D., Committee Member	Date
Laurie Gaydos, Ph.D. Associate Chair for Academic Affairs, Executive MPH Program	Date

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Olawunmi Obisesan

MPH, Emory University, 2017

DHEd, A T Still University, 2016

BSN, Southeast Missouri State University, 2013

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Thesis Committee Chair: Iris E. Smith, PhD, MPH

An abstract of

A thesis submitted to the Faculty of the

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in partial fulfillment of the requirements for the degree of

Master of Public Health in Prevention Science

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Abstract

Self-management programs enhance self-efficacy in the adoption and sustenance of healthier behaviors among chronically-ill individuals. They provides the opportunity for patients to play an active role in managing their conditions, ultimately promoting coping-independence and better health outcomes. The purpose of this study was to examine the effectiveness of the Chronic Disease Self-Management Program (CDSMP) in improving perceived self-efficacy in self-management behaviors among a random sample of individuals who live with chronic diseases in Southeast Missouri. Secondary data analysis was conducted on 46 adult participants. Data were collected at Week 1 (baseline) and Week 6 (post-CDSMP). A dependent *t* test was conducted to examine outcome measurements related to perceived self-efficacy in seven chronic disease self-management behaviors. The mean age of participants was 55.02 (±14.639) years; the majority was female (67.4%), White (73.9%), and 100% reported at least one chronic disease. A dependent *t* test analysis indicated the CDSMP was effective in improving perceived self-efficacy in all seven self-management behaviors: Managing condition (p = 0.005, 95% CI = -1.462, -.277), eating healthier (p = 0.002, 95% CI = -1.520, -.349), being physically active (p <.001, 95% CI = -1.690, -.527), managing stress (p <.001, 95% CI = -1.664, -.510), making treatment decisions (p <.001, 95% CI = -2.475, -1.134), taking medications (p <.001, 95% CI = -2.419, -.885), and managing pain (p <.001, 95% CI = -2.290, -.927). A wide-scale integration of the CDSMP into the routine care, health organizations' standards of care, case management, and referrals hold promise for better disease control and improved health outcomes among chronically-ill individuals.

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Chapter I: Introduction

Introduction and Rationale

A chronic disease is a disease that is long in duration, usually lasting three or more months (National Health Council, 2014). Other experts have defined chronic diseases as having a protracted clinical course, long latency period, and lacking a cure (Bentzen, 2003; Martin, 2007). Chronic diseases remain the leading causes of increased disability, morbidity, and mortality rates in the United States. According to the Centers for Disease Control and Prevention (CDC, 2016), chronic diseases, which include heart disease, cancer, stroke, hypertension, obesity, arthritis, and diabetes, were associated with more than 67% of all leading causes of death in the United States in 2011 (CDC, 2016; Hoyert & Xu, 2012). Heart disease and cancer alone accounted for about 48% of all deaths in 2010. Of the 10 leading causes of death in the United States. in 2010, seven of these were chronic diseases (CDC, 2016). About 117 million adults in the United States had at least one chronic health disease in 2012, with another 26% having two or more chronic diseases (CDC, 2016; Hoyert & Xu, 2012), and it is estimated that 164 million people will be affected by 2025 (Partnership for Solutions, 2007).

Chronic diseases may occur due to nonmodifiable factors, such as genetics, but may also result from specific risk factors such as physical inactivity, diet, obesity, tobacco use, and social determinants of health (CDC, 2015). Chronic diseases and their associated complications significantly increase healthcare expenditure. In the United States, the burden of chronic diseases, although noncommunicable in nature, was associated with 80% of the total national health care expenditure for 2010, which exceeded that of infectious diseases (CDC, 2015). Patients with chronic diseases are

frequent users of healthcare services; they account for about 76% of doctors' visits, 91% of filled prescription medications, and 81% of hospitalizations (Partnership for Solutions, 2007).

The Chronic Disease Self-Management Program

The Chronic Disease Self-Management Program (CDSMP) was developed by Stanford University's Patient Education Research Center to empower individuals with chronic diseases to self-manage their health diseases effectively (Stanford School of Medicine, 2015a). According to Stanford School of Medicine's Patient Education Research Center (2016b), its mission is the following:

> [to] develop and offer programs that we test for effectiveness, usually with randomized, controlled trials that are funded by research grants and span one to five years. The aim of all of our programs is to improve the triple aims of better health, better health care, and reduced costs. (para. 3)

The CDSMP is delivered through a 2-2.5 hour, 6-week interactive workshop. Participants who have different chronic diseases, who attend the 2-2.5-hour weekly workshop, are facilitated by using a highly-structured manual by two Stanford University CDSMP-trained peers who themselves have different chronic diseases (Stanford School of Medicine, 2015a). The CDSMP was not designed to replace any existing treatment programs that participants are on, but instead complements and enhances these treatment programs by equipping participants with the skills they need to coordinate what is essential to an active management of their health, which reduces hospitalizations and re-admissions. The CDSMP focuses on teaching program participants by using hands-on techniques on how to make appropriate decisions; maintain effective communication with

healthcare professionals, family, and friends; deal with feelings of pain, isolation, frustration, and fatigue; follow healthy weight management; maintain appropriate use of medications; and use exercise to improve and maintain flexibility, strength, and endurance (Stanford School of Medicine, 2015a).

Problem Statement

Patients with chronic diseases often struggle with the effective management of their symptoms. One of the main strategies used by the CDC to address the burden of chronic disease and its impact on public health is the use of "community resources linked to clinical services that sustain improved management of chronic conditions" (Hand, 2014, para. 5). In recent years, the public health community has focused more on the prevention and management of chronic diseases, especially heart diseases, to reduce the increasing morbidity and mortality rates (Cohen, Chávez, & Chehimi, 2010). The University of Michigan's Center for Managing Chronic Disease (CMCD, 2016) recommended the prevention and control of the effects and complications associated with chronic diseases should focus on improving the self-management capacity of patients with chronic diseases. Evidence exists that when patients with chronic diseases are empowered with self-efficacy and confidence skills, which make them effective managers of their health diseases, their health outcomes and quality of life are ultimately improved (Boren, Gunlock, Schaefer, & Albright, 2007; Lorig et al., 1999; Zwar et al., 2006). Therefore, a need exists to equip individuals with chronic diseases with the practical skills necessary to manage their diseases, which will subsequently improve positive health outcomes and decrease healthcare costs.

Theoretical Framework

The self-efficacy theory (SET) was the theoretical framework, which guided the design of the CDSMP (Lorig, 2014). Developed by Bandura, the SET postulates that an individual's confidence, which he or she possesses, is the capacity to adopt/execute certain behaviors that significantly influence successful actions and behavioral outcomes (Bandura, 1977; Boston University School of Public Health, 2013). The individual's confidence in his or her capacity is a key determinant of how effective he or she will be in performing behaviors and executing actions that are necessary for controlling and managing specific situations as they arise (Bandura, 1995).

Self-efficacy influences individuals' motivations, abilities to learn, and performances; they will only make an effort to learn and perform specific actions in which they know they will achieve success (Lunenburg, 2011). According to Gecas (2004), "High self-efficacy has beneficial and therapeutic consequences for individuals and low self-efficacy (powerlessness) has negative and maladaptive consequences" (p. 298). The CDSMP, therefore, focuses on the enhancement of self-efficacy through the introduction of coping strategies, which include problem-solving and decision-making skills mastery, behavior modeling, and re-interpretation of situations as they apply to their chronic health diseases (Lorig, 2014).

Figure 1. Concept of influences on perceived self-efficacy based on the conceptions of Bandura. Adapted from "The practice of patient education: The theoretical perspective," by R. L. Syx, 2008, *Orthopedic Nursing, 27* (1), p. 52. Copyright 2017 by Wolters Kluwer Health, Inc.

Purpose Statement

In this study, I analyzed secondary data from the Southeast Missouri Regional Arthritis Center (SEMORAC), a CDC- and State-funded community-based program that focuses on the self-management of arthritis and all chronic diseases in Southeast Missouri. The purpose of this study was to examine the effectiveness of the CDSMP workshop in improving perceived self-efficacy in self-management behaviors among a random sample of individuals, 18 years and older, who lived with chronic diseases in Southeast Missouri. The intervention in this study was the participation in the CDSMP workshop. A single pre-intervention measurement of various self-management behaviors was taken before individuals participated in the CDSMP workshop (intervention), and a post-intervention measurement was taken of the same self-management behaviors after individuals participated in the CDSMP workshop. To examine the effectiveness of the workshop, the following self-management behaviors were evaluated at baseline (week one) and after six weeks to measure the degree of change of the following:

- Perceived ability to manage diseases
- Perceived ability to eat healthier
- Perceived ability to be physically active
- Perceived ability to manage stress
- Perceived ability to make treatment decisions
- Perceived ability to take medication
- Perceived ability to manage pain

Descriptive statistics and inferential statistics (paired sample *t*-test) were used to estimate outcome measurements related to perceived self-efficacy in seven self-management behaviors.

Research Questions and Hypotheses

Research Questions (RQ)

RQ1: What is the overall impact of the CDSMP on improving perceived self-efficacy in self-management behaviors among adult workshop participants in Southeast Missouri?

RQ2: Are there any statistically significant differences in measurements of self-management behaviors measured at week one (baseline) and six weeks?

Hypotheses

$H_0$1: There is no difference between the pre-intervention and the post-intervention measurements of perceived ability to manage chronic diseases in CDSMP workshop adult participants in Southeast Missouri.

$H_1$1: There is a difference between the pre-intervention and the post-intervention measurements of perceived ability to manage chronic diseases in CDSMP workshop adult participants in Southeast Missouri.

$H_0$2: There is no difference between the pre-intervention and the post-intervention measurements of perceived ability to eat healthier in CDSMP workshop adult participants in Southeast Missouri.

$H_1$2: There is a difference between the pre-intervention and the post-intervention measurements of perceived ability to eat healthier in CDSMP workshop adult participants in Southeast Missouri.

$H_0$3: There is no difference between the pre-intervention and the post-intervention measurements of perceived ability to be physically active in CDSMP workshop adult participants in Southeast Missouri.

$H_1$3: There is a difference between the pre-intervention and the post-intervention measurements of perceived ability to be physically active in CDSMP workshop adult participants in Southeast Missouri.

$H_0$4: There is no difference between the pre-intervention and the post-intervention measurements of perceived ability to manage stress in CDSMP workshop adult participants in Southeast Missouri.

$H_1$4: There is a difference between the pre-intervention and the post-intervention measurements of perceived ability to manage stress in CDSMP workshop adult participants in Southeast Missouri.

$H_0$5: There is no difference between the pre-intervention and the post-intervention measurements of perceived ability to make treatment decisions in CDSMP workshop adult participants in Southeast Missouri.

$H_1$5: There is a difference between the pre-intervention and the post-intervention measurements of perceived ability to make treatment decisions in CDSMP workshop adult participants in Southeast Missouri.

$H_0$6: There is no difference between the pre-intervention and the post-intervention measurements of perceived ability to take medication in CDSMP workshop adult participants in Southeast Missouri.

$H_1$6: There is a difference between the pre-intervention and the post-intervention measurements of perceived ability to take medication in CDSMP workshop adult participants in Southeast Missouri.

$H_0$7: There is no difference between the pre-intervention and the post-intervention measurements of perceived ability to manage pain in CDSMP workshop adult participants in Southeast Missouri.

$H_1$7: There is a difference between the pre-intervention and the post-intervention measurements of perceived ability to manage pain in CDSMP workshop adult participants in Southeast Missouri.

Significance

Self-management education programs can help increase the confidence and mastery of new self-management behaviors and skills necessary for individuals to control and manage their chronic diseases. Experts have found the CDSMP to be a more inexpensive approach to improving self-efficacy and self-management skills among

chronically ill patients, and may significantly help reduce emergency room visits and re-hospitalizations in Southeast Missouri. This study's findings could provide useful information that supports the implementation of the CDSMP in several communities in Southeast Missouri.

Definition of Terms

Chronic disease: A health condition that developed slowly and has lasted for at least three months (Goodman, Posner, Huang, Parekh, & Koh, 2013). Many chronic diseases are preventable and treatable but often not curable.

Chronic disease management: A pre-defined set of activities aimed at addressing a specific disease with the aim of improving the health outcomes and quality of life in a chronically-ill patient (American Academy of Family Physicians, 2017).

Chronic disease management self-management (CDSMP): Developed by Stanford University Patient Education Center, the CDSMP focuses on the role of the individual in in coping with symptoms associated with their chronic diseases (Stanford School of Medicine, 2015a).

Lay leaders: Members of a particular community who have been trained and can be trusted to act as a legitimate source of information, and provide support and advice to others in the same community (Glanz, Rimer, & Viswanath, 2008). Lay leaders have often been described as informal change agents (McLean, Williams, Krueger, & Lamont, 2013).

Peer mentors: These are individuals who possess the ability to influence another person's decisions and actions strongly because they currently experience or have experienced similar issues as those in the target population (Petosa & Smith, 2014).

Self-efficacy: a person's belief that he or she has the capability to produce an effect he or she desires. In addition, self-efficacy can be influenced by or achieved through mastery experiences (Bandura, 1994).

Self-management: The decisions, actions, and behaviors in which an individual engages that puts them in control of issues that affect him or her (Group Health Research Institute, 2017). In individuals who are chronically ill, self-management refers to their effectiveness in taking control of their health.

Chapter II: Review of the Literature

Introduction

The causes of chronic diseases are complex, with several health risk factors, which increase an individual's susceptibility (Australian Institute of Health and Welfare, 2014). The effects of chronic diseases are persistent and long-term, lasting three months or longer; as such, an individual may require long-term management (Goodman et al., 2013). This chapter examines existing literature, which supports a need for chronic disease self-management among individuals who are chronically ill; the appropriateness of the SET as a guiding theoretical framework for the implementation of the CDSMP; as well as the sampling and research methodology.

Literature Review Strategy

To identify existing information and studies that has been done on the effectiveness of the CDSMP, current peer-reviewed articles (1999 to 2016) were sought and retrieved from four research databases: ScienceDirect, Academic Search Complete, Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, and MEDLINE. Studies as early as 1999, the year the CDSMP was introduced, were included in the literature review because they provided an initial look at the basis upon which the CDSMP was determined to be evidence-based. In searching through existing literature, the following search strings were used: *Chronic diseases; chronic diseases AND self-management; chronic diseases AND hypertension AND self-management; chronic diseases AND diabetes AND self-management; self-management AND health education; self-management AND health promotion;* and *self-management AND healthcare.* The review of literature also included an examination of organizational websites (i.e.,

government, nongovernment, not-for-profit), technical reports, and news articles for CDSMP-related news/information. A total of 24 articles met the pre-determined inclusion criteria: self-management, CDSMP, adult population, and chronic disease. A review of similar research studies, which used a similar theoretical framework, sampling method, and research methodology, were also initiated.

Review of Literature Related to Chronic Disease Self-Management

Self-management programs can equip individuals who live with chronic diseases with the tools necessary to live healthier lives. The strengthening of self-efficacy through various health education techniques, which include demonstrations, case studies, and stories of personal experiences, have been shown to be an effective way to enhance the self-responsibilities of individuals who live with chronic diseases, especially in identifying associated factors (Lorig et al., 2001b; Ritter, Lee, & Lorig, 2011). Although self-management educational strategies may be traditional, the inclusion of innovative techniques, such as the setting of measurable and achievable goals, problem-solving, and enhanced communication, can improve health outcomes and overall quality of life (Bodenheimer, Lorig, Holman, & Grumbach, 2002). Public health experts have focused on the role of lay health advisors as *informal change agents* in facilitating health education programs. Lay health advisors are community members or peers who can be trusted to act as legitimate sources of information by providing support and advice to others in the same community (Acevedo-Polakovich, Niec, Barnet, & Bell, 2013; Glanz et al., 2008; Otiniano, Carroll-Scott, Toy, & Wallace, 2011). Three main chronic disease self-management program models exist: (a) the expert patient program, which promotes patient knowledge and skills through supportive physician team members; the (b)

Stanford model, which builds self-efficacy with peer-educators; and the (c) Flinders model, which emphasizes patient-physician interaction and engagement using the principles of cognitive behavioral therapy (Johnston, Liddy, Ives, & Soto, 2008). This study focused on the Stanford model of the CDSMP.

Review of Literature related to the Stanford Model of the CDSMP

Although an increase in the global and national prevalence of chronic diseases exists, evidence-based programs, such as the CDSMP, can be used to prevent or minimize its disabling effects. Unlike traditional disease-specific self-management intervention, the CDSMP was developed in the 1990s by researchers at Stanford Patient Education Research Center as a broader chronic disease intervention for individuals who were chronically ill with a goal of improving meaningful health-related knowledge and behaviors, which contribute to increased wellness and positive health outcomes (Lorig, Mazonson, & Holman, 1993; Lorig, Lubeck, Kraines, Seleznick, & Holman, 1985).

Several researchers have conducted studies on the effectiveness and successes of the CDSMP in improving self-management behaviors, skills, and functional abilities among patients who were chronically-ill (Ahn et al., 2013; Dongbo, Ding, McGowan, & Fu, 2006; Haas et al., 2005; Harrison et al., 2011; Siu, Chan, Poon, Chui, & Chan, 2007). The study by Haas et al. (2005) found that an association between the CDSMP and improvement in emotional well-being (p = .037), baseline disability days (p = .027), and higher baseline disability days (p = .037). Ahn et al. (2013) conducted a 12-month national study on the healthcare savings of the CDSMP and found a 5% reduction in emergency room visits and a 3% reduction in hospitalizations at six months among CDSMP participants. Ahn et al. also found the 5% reduction in emergency rooms was

maintained at 12 months. The researchers translated these reductions to an estimated net individual savings of $364 and a national net savings of $3.3 billion with a CDSMP targeted population of 5% of individuals who were chronically ill. In light of their findings, the researchers suggested a significant value in tertiary prevention interventions, such as the CDSMP, and, as such, should be adopted across the nation.

Although available in limited languages and translations, evidence exists of successful replications of the CDSMP in other geographical locations outside the United States. Dongbo et al. (2006) found that despite some language and content deficiencies related to the Chinese culture, CDSMP participants in Shanghai still reported increased perceptions of improvements in positive behaviors, self-management skills, knowledge, self-confidence, overall health status, and quality of life. Siu et al. (2007) conducted an experimental study to compare the impact of a 6-week CDSMP workshop to that of a Tai-Chi class in Hong Kong. This study evaluated the 6-week CDSMP in Hong Kong. The study found that CDSMP participants demonstrated a higher utilization of cognitive pain management methods compared to the Tai-Chi group. CDSMP participants also demonstrated higher energy levels, higher disease management self-efficacy, and a change in coping strategies compared to the Tai-Chi group. The study by Harrison et al. (2011) found benefit in the group process and composition, which characterized the facilitation of the CDSMP. The study participants rated the CDSMP's effective group process as the most consistent predictor of individual self-care behavior, program satisfaction, and long-term group outcomes.

Review of Literature Related to Theoretical Framework: Self-Efficacy Theory

An association exists between perceptions of self-efficacy and changes in and maintenance of health behavior (Strecher, McEvoy, DeVellis, Becker, & Rosenstock, 1986). An individual's perception of self-efficacy will determine the activities in which he or she participates, the effort put into these activities, and the persistence in continuing regardless of the obstacles he or she faces or the outcomes (Bandura & Adams, 1977). Several researchers identified a direct relation between levels of self-efficacy and individuals' determination and abilities to deal with their chronic health condition; some studies specifically found that the manipulation and perceived enhancement of self-efficacy could subsequently lead to desired changes in health behavior (Ahmadi, Shariati, Jahani, Tabesh, & Keikhaei, 2014; Bazargani et al., 2011; Graham, Smith, Hall, Emerson, & Wilson, 2016; Strecher et al., 1986;). The study by Bazargani et al. (2011) reported an increase in self-efficacy after participation in a program similar to the CDSMP. Participants in the Chronic Disease Self-Management Rehabilitation Program (N = 150) reported enhanced self-efficacy and subsequently a higher adherence to prescribed medications and treatment compared to nonparticipants at the 2-month, and the 3-month follow-up. Graham et al. (2016) examined the impact of a CDSMP workshop, which included a10-minute fall-prevention content to improve self-efficacy related to falls in aging adults. Participant's Fall Efficacy Scale changed significantly (p = 0.043), and a large number of participants also improved Fall Efficacy Scale (p = 0.038) post-CDSMP. Willis (2015) described self-efficacy as a key component of the CDSMP. His study found as peers share their disease experiences with program participants, they highlighted the practical implications of living with chronic diseases and dealt with

associated symptoms, and ultimately asked for the help they needed to cope with their diseases. The study by Ahmadi et al. (2014) found in a sample of sickle-cell patients, 50.7% of participants reported moderate self-efficacy levels pre-CDSMP compared to 81.2% who reported high self-efficacy levels post-CDSMP.

The effectiveness of the CDSMP in enhancing self-efficacy has been similar across several settings and in different populations. Kim and Youn (2015) found a significantly high level of benefits, including self-efficacy and physical activity, among older Korean adult CDSMP participants compared to those in a control group. Their findings also indicated the benefits associated with the CDSMP were higher in individuals with low health literacy levels compared to those with high health literacy levels. Similarly, Chan et al. (2010) conducted a longitudinal study on the effectiveness of a 6-week locally-adapted CDSMP among 732 Hong Kong adult CDSMP participants, aged 55 or older, in a community-based/primary care setting. Measurements from baseline to 6 months indicated significant improvements in measures of self-efficacy, among other variables, such as self-management behaviors, which suggested that when integrated into existing community-based/primary care services, the CDSMP may help improve self-efficacy in patients who were chronically ill.

Review of Literature Related to Healthcare Savings

The National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP, 2009) reported that chronically-ill patients were the primary users of healthcare in the United States and took up more than 75% of the national healthcare expenditure, with the 15 top health conditions accounting for 44% of the total healthcare cost (Partnership for Solutions, 2004; Stanton, 2006).

Data show that the lifetime healthcare cost for individuals who are chronically ill and who suffer from at least one chronic disease are about five times greater than that of those who do not suffer from any chronic disease (Partnership for Solutions, 2004). The healthcare costs of individuals with multiple chronic conditions are, however, seven times more than those with only one chronic condition (Stanton, 2006). With increasing public awareness of the severity and extent of chronic diseases, public health experts have focused on estimating the cost savings associated with the delivery and participation in evidence-based programs such as the CDSMP. Several studies have demonstrated evidence of the CDSMP's effectiveness in reduced hospitalizations rates, number of days/nights in the hospital, and slight decrease in physician visits (Lorig et al., 1999), as well as decreased visits to the emergency room in individuals ages 67 years and above (Jaglal et al., 2014). Wheeler (2003) found a reduction in in-patient days (46%, $p < 0.05$) and in-patient costs (49%, $p < 0.05$) among participants in a heart disease management program compared to nonparticipants.

According to Ahn, Smith, Altpeter, Post, and Ory (2015), a potential exist to save an estimated $3.3 billion in healthcare expenditure just by increasing CDSMP access to 5% of adults who suffer from one or more chronic conditions. The delivery cost of the CDSMP pales in comparison to the short-term cost-savings due to the utilization of fewer healthcare services (Lorig et al., 1999). The $70-$200, which it costs to deliver the CDSMP to an individual, yields a 6-month savings of $750 and a 12-month savings of $790-$990 (Lorig et al., 1999, 2001a). However, these savings decrease at 24 months to $390-$520 (Lorig et al., 2001a). Kaiser Permanente CDSMP participants demonstrated fewer emergency room visits, hospitalizations, and reduced healthcare costs in the year

they attended the CDSMP workshop compared to the prior year when they did attend the workshop (Lorig et al., 2001a). With an individual cost of $200 per program participant and $97,800 for a total of 489 participants, a 12-month healthcare utilization savings of $990 would save Kaiser around $400,000 (Lorig et al., 2001a).

In summary, this review of literature indicated that the CDSMP can be beneficial to improve the goals of the triple aim framework for providing healthcare services, which include improved population health, enhanced patient care (access, reliability, and quality), and better healthcare value and lower costs (Ahn et al., 2013; Berwick, Nolan, & Whittington, 2008). A widespread implementation of the CDSMP holds profound promise for population health promotion.

Chapter III: Methodology

Introduction

This chapter presents a detailed description of the research process used to investigate the effectiveness of the CDSMP program in Southeast Missouri. The information presented in this chapter include the following: research design and methodology, sample characteristics, data collection and instrumentation, and methods of data analysis.

Purpose of Study

The purpose of this research was to perform a secondary data analysis of the Southeast Missouri Regional Arthritis Center's (SEMORAC) CDSMP workshop to examine the overall effectiveness of the CDSMP in improving perceived self-management behaviors in seven different chronic disease self-management areas among participants in Southeast Missouri. This study also examined the difference in the pre and post intervention scores of participants' perceptions of self-efficacy in each chronic disease self-management behavior.

Objectives of the Study

This study was guided by the following objectives:

- To determine the overall impact of the CDSMP on self-management behaviors among participants in Southeast Missouri.
- To identify significant differences in measurements of perceived self-management behaviors among participants in Southeast Missouri.

Sample Characteristics

This study was based on a secondary data analysis of perceived self-management behaviors of participants, ages 23 to 85 years, who attended one of several CDSMP workshops in 14 Southeast Missouri counties. All participants met the following eligibility criteria for inclusion: diagnosis of a chronic disease, informed consent for data collection, and successful completion of a six-week CDSMP workshop. Of more than 100 participants, only 46 met all the criteria and whose data were, therefore, used for this study. There was no comparison group. G*Power recommends a minimum sample size of 45 participants is necessary to achieve the following statistical parameters: effect size of .5, alpha (α err prob) of .05, and power (1-β err prob) .95 (See Table 1). An effect size of .5 represents a medium effect and is adequate and consistent enough to detect significant between-group differences in the sample population, allowing for a testing of the null hypothesis (Ellis, 2010; Sullivan & Feinn, 2012). By setting the alpha to an arbitrary value of .05, the confidence in rejecting the null hypothesis increases and I am protected against making a Type 1 error (Mudge, Baker, Edge, & Houlahan, 2012). A power of .90 prevents me from making a Type 2 error, which minimizes the probability of accepting the null hypothesis when it is not true (Mudge et al., 2012).

Table 1. *G*Power Statistical Power Computation for Sample Size*

t tests – Means: Difference between two dependent means (matched pairs)			
Analysis:	A priori: Compute required sample size		
Input:	Tail(s)	=	One
	Effect size dz	=	0.5
	α err prob	=	0.05
	Power (1−β err prob)	=	0.95
Output:	Noncentrality parameter δ	=	3.3541020
	Critical t	=	1.6802300
	Df	=	44
	Total sample size	=	45
	Actual power	=	0.9512400

Research Design and Methodology

This study was a pre-experimental one-group pretest/posttest study using secondary dataset of a survey on adult CDSMP participants in Southeast Missouri. The original CDSMP survey collected data on several chronic disease self-management behaviors. In this research study, however, I focused on measurements of perceived self-efficacy in seven chronic disease self-management behaviors, specifically in the following areas: disease management, healthier eating, physical activity, stress management, decision-making, taking medications, and pain management. The distribution of seven survey-items allowed me to conduct a quantitative analysis to identify any changes from baseline levels.

Data Collection Procedures

Because this was a secondary data analysis, in this study, I used an existing dataset. After providing informed consent and program registration forms to participants, trained CDSMP facilitators/leaders administered self-efficacy pen and paper survey forms at week one of the workshop (baseline) and again at week six (post-intervention).

While the program registration forms were used to collect detailed information on the participants' demographics and health information, the pre- and post-intervention surveys only collected information on age, living status, and perceived efficacy on seven disease self-management behaviors to measure programmatic impact before and after the CDSMP workshop. Along with the post-intervention survey administered in week six, the program leaders also administered participants' program evaluation surveys, specifically on their perceptions of the program quality and overall satisfaction ratings for the CDSMP program instructors and workshop. Perceived self-efficacy scores at baseline and at six weeks were measured using a seven-item questionnaire on the following disease self-management behaviors:

- Perceived ability to manage diseases
- Perceived ability to eat healthier
- Perceived ability to be physically active
- Perceived ability to manage stress
- Perceived ability to make treatment decisions
- Perceived ability to take medication
- Perceived ability to manage pain

Survey responses were entered manually into Microsoft Excel spreadsheet on the computers immediately after completion. Respondents were not compensated for their participation. Permission to access these data was obtained from the RAC. Exemption for the utilization of secondary dataset was approved by Emory University's Institutional Review Board on February 1, 2017.

Operationalization and Measurements of Variables

Operationalization provides a description of what was measured, how these were measured, and the rules that were used to assign specific values to the observed variables and the interpretation of the observed values (Check & Schutt, 2012). The theoretical framework SET was used to guide the identification of individuals' confidence that they had the capacity for specific self-management behaviors, before and after the CDSMP. I hypothesized that the CDSMP could enhance perceived self-efficacy score, as evidenced by an increase in post-intervention scores from baseline. In this study, I measured concepts of self-efficacy at the following behavioral areas common to the management of chronic conditions: disease management, healthier eating, physical activity, stress management, decision-making, taking medications, and pain management. These behaviors were measured on a 10-point score with higher scores, which indicated higher levels of perceived self-efficacy in performing specific behaviors.

Instrumentation

Staff at the SEMORAC used a modified version of the original Stanford University Patient Education Center's Self-Efficacy for Managing Chronic Disease 6-Item Scale as its data collection tool. This survey is comprised of questions that allow for data collection on perceived confidence in performing specific chronic disease self-management activities. The original self-efficacy scale has an internal consistency reliability of .91 (Stanford University Patient Education Center, n.d.). The survey covers major chronic disease domains, especially those covered by the CDSMP workshop, and has been described as less burdensome for participants (Stanford University Patient Education Center, n.d.). This survey was further modified to collect information on

demographics and other activities covered in the CDSMP workshop. Self-efficacy scores ranged from 1 (not at all confident) to 10 (totally confident) on a Likert-type response scale. There were no identified threats to external validity for this study.

Data Analysis

To answer the research question on the overall impact of the CDSMP on self-management behaviors in participants and statistically significant differences in pre-test/post-test measurements of self-management behaviors, I used descriptive and inferential statistics. Descriptive statistics showed the mean and standard deviation values of demographics and pre/post intervention scores of participants perceptions of self-efficacy in each chronic disease self-management behavior, ranging from 1 (not at all confident) to 10 (totally confident). I used a dependent *t* test to determine overall statistically significant differences in perceived self-efficacy in all seven self-management behaviors before and after participation in the CDSMP. Results were considered significant at $p < 0.05$.

Chapter IV: Results

Introduction

The purpose of this data analysis was to examine the effectiveness of the CDSMP workshop in 46 adult participants by using a dependent sample *t*-test to compare pre-and post-intervention data. Chapter four is organized into two sections: descriptive statistics of the sample participants' demographics and individual questions, and the inferential statistics of the research questions and hypothesis testing. I received data in a Microsoft Excel format and exported them into SPSS 24 for analysis.

Key Findings

Demographics. A total of 46 participants was included in this study. The mean age of respondents was 55.02 years (±14.639). The majority of the population was female (67.4%), White (73.9%), did not live alone (100%), and reported having at least one chronic disease (100%). All participants had attended a 6-week CDSMP workshop in different Southeast Missouri counties. All participants indicated completing all six workshops in its entirety.

Pre-CDSMP *Baseline* Self-Efficacy. Pre-CDSMP, participants reported an average of 7.54 (±1.870) for perceived self-efficacy in managing condition, 7.15 (±2.044) for perceived self-efficacy in eating healthier. They reported 7.30 (±2.250) for perceived self-efficacy in being physically active, 7.04 (±1.897) for perceived self-efficacy in managing stress and 6.48 (±1.975) for perceived self-efficacy in making treatment decisions. In addition, they reported 7.46 (±2.483) for perceived self-efficacy in taking medications and 6.33 (±2.222) for perceived self-efficacy in managing pain.

Post-CDSMP *Outcome* Self-Efficacy. Post-CDSMP, participants reported an average of 8.41 (±1.275) for perceived self-efficacy in managing condition. They reported 8.09 (±1.589) for perceived self-efficacy in eating healthier, 8.41 (±1.423) for perceived self-efficacy in being physically active, 8.13 (±1.166) for perceived self-efficacy in managing stress, and 8.28 (±1.148) for perceived self-efficacy in making treatment decisions. In addition, they reported 9.11 (±1.140) for perceived self-efficacy in taking medication, and 7.93 (±1.357) for perceived self-efficacy in managing pain.

Correlations

Table 2 shows varying degrees of positive correlations for all seven self-management behaviors between the two-time points: baseline to post-intervention. Perceived self-efficacy in managing disease condition showed a weak but positive correlation at .239. Perceived ability to eat healthier showed a moderately strong but positive correlation at .434. Perceived ability to be physically active showed a moderately strong but positive correlation at .508. Perceived ability to manage stress showed a weak but positive correlation at .269. Perceived ability to make treatment decisions showed a very weak but positive correlation at .027. Perceived ability to take medication showed a very weak but positive correlation at .139. Perceived ability to manage pain showed a weak but positive correlation at .251. Overall, only two areas (Perceived ability to eat healthier and be physically active) showed a statistical significant difference, $p<.05$ (See Table 2). A positive correlation between the pre- and post-tests suggested participants' perceived self-efficacy improved as they progressed through the 6-week program.

Table 2
Correlation Between Time Points

		Sig	Correlation
Pair 1	pre-manage condition & post-manage condition	.109	.239
Pair 2	pre-eat healthier & post-eat healthier	.003	.434
Pair 3	pre-more active & post-more active	.000	.508
Pair 4	pre-manage stress & post-manage stress	.071	.269
Pair 5	pre-make treatment decision & post-make treatment decision	.857	.027
Pair 6	pre-take medication & post-take medication	.356	.139
Pair 7	pre-manage pain & post-manage pain	.093	.251

Dependent *t*-Test Results. The results suggested statistically significant differences between baseline and post-intervention perceived self-management behaviors, which provided support for the acceptance of the seven alternative hypotheses.

Perceived Self-Efficacy in Managing Condition. I used a dependent *t*-test to determine the statistical significance, if any, in the mean difference between participants' pre- and post- CDSMP perceived self-efficacy in managing their conditions. No extreme outliers were detected in a boxplot, and all data were included in the analysis. Participants' self-efficacy in managing their conditions was statistically significantly higher post-CDSMP (8.41 ±1.275) than pre-CDSMP (7.54 ±1.870), t_{45} = -2.955, p = 0.005, 95% confidence interval (CI) = -1.462, -.277 (See Table 3 and Figure 2).

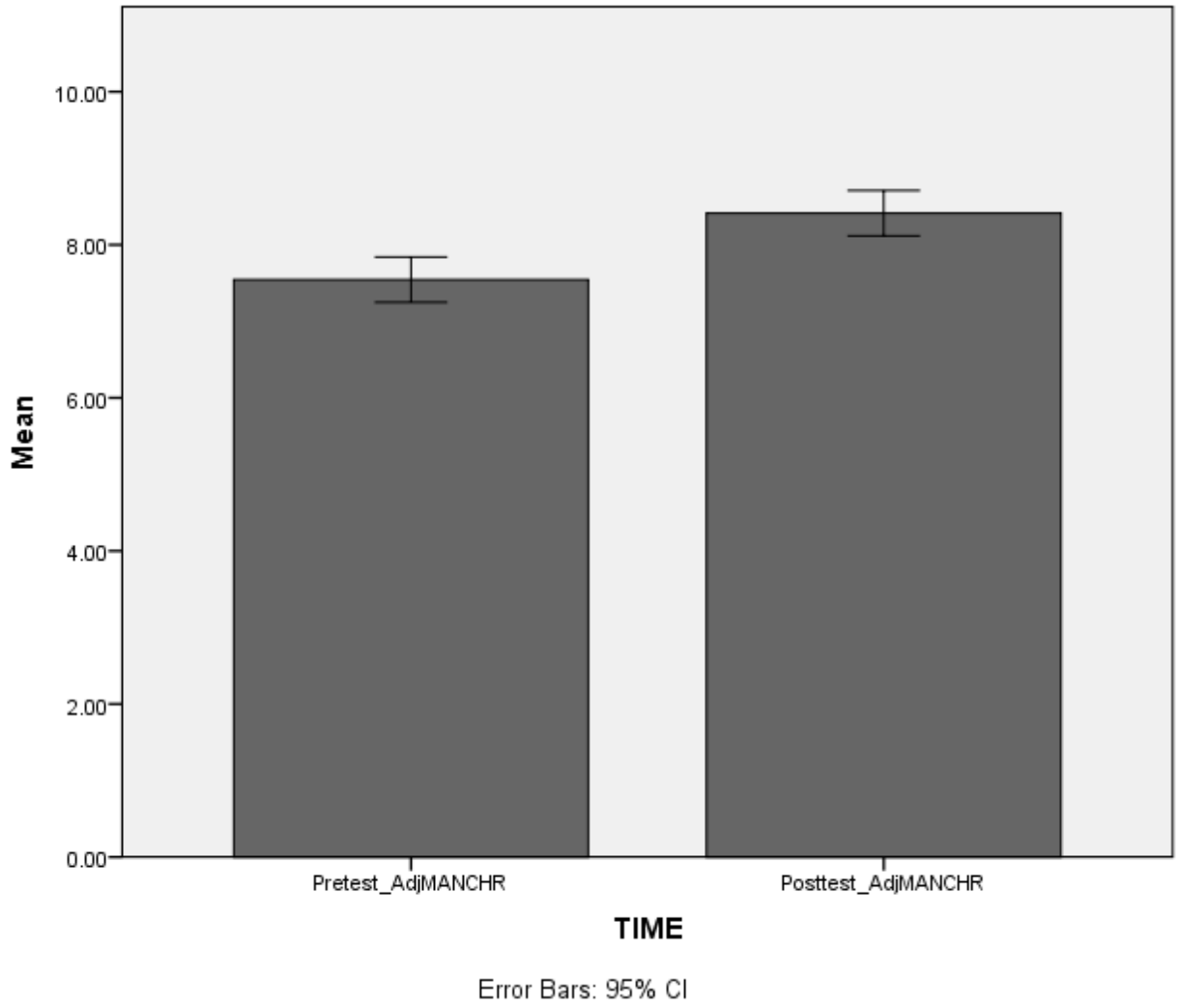

Figure 2. Mean changes in perceived self-efficacy in managing condition pre- and post CDSMP, p = 0.005

Perceived Self-Efficacy in Eating Healthier. A dependent *t*-test was used to determine the statistical significance, if any, in the mean difference between participants' pre- and post- CDSMP perceived self-efficacy in eating healthier. No extreme outliers were detected in a boxplot, and all data were included in the analysis. Participants' self-efficacy in eating healthier was statistically significantly higher post-CDSMP (8.09

±1.589) than pre-CDSMP (7.15 ±2.044), $t_{45} = -3.217$, $p = 0.002$, 95% CI = -1.520, -.349 (See Table 3 and Figure 3).

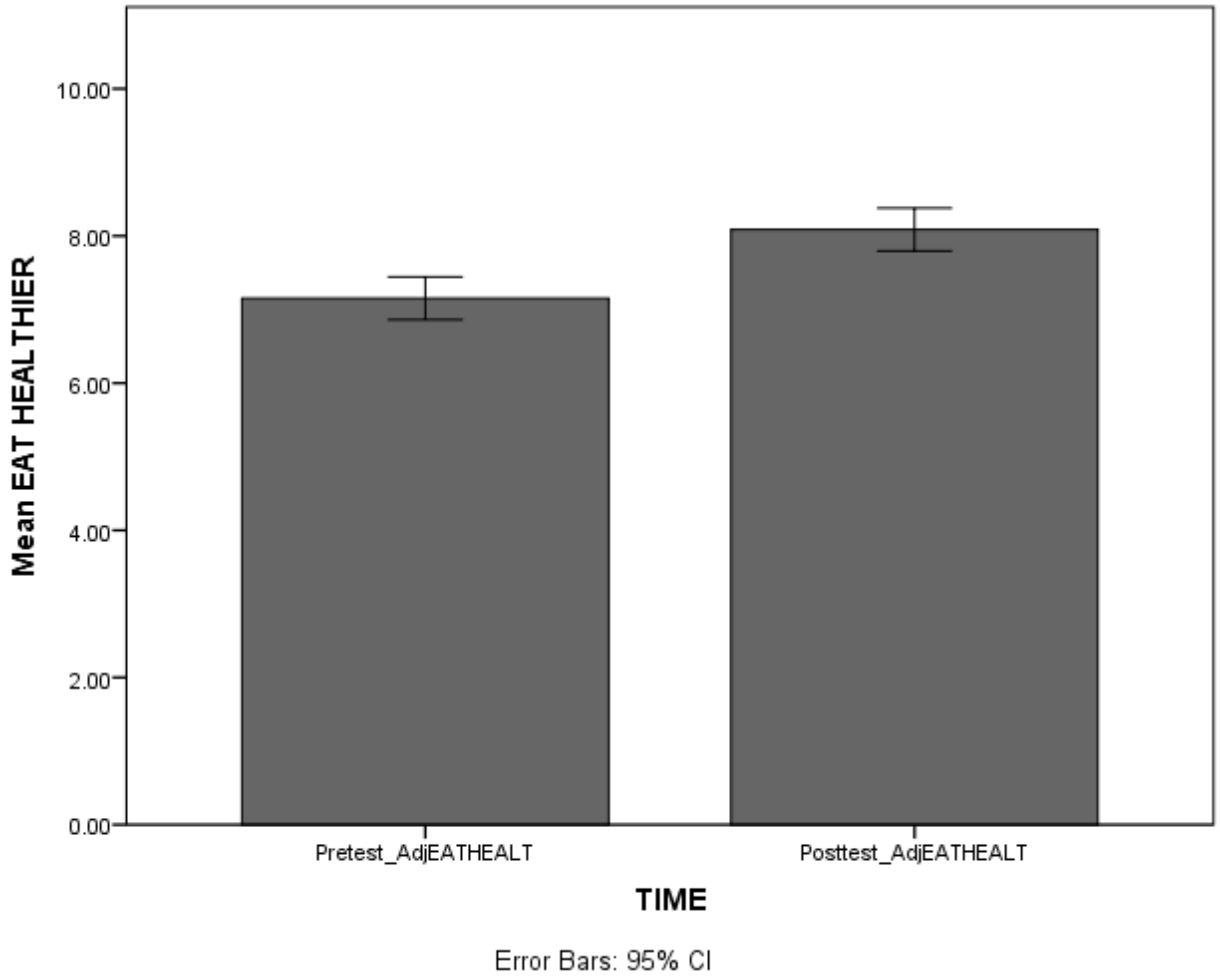

Figure 3. Mean changes in perceived self-efficacy in eating healthier pre- and post CDSMP, p = 0.002

Perceived Self-Efficacy in Being Physically Active. I used a dependent *t*-test to determine the statistical significance, if any, in the mean difference between participants' pre- and post- CDSMP perceived self-efficacy in being physically active. No extreme outliers were detected in a boxplot, and all data were included in the analysis. Participants' self-efficacy in being physically active was statistically significantly higher

post-CDSMP (8.41 ±1.423) than pre-CDSMP (7.30 ±2.250), t_{45} = -3.841, p <.001, 95% CI = -1.690, -.527 (See Table 3 and Figure 4).

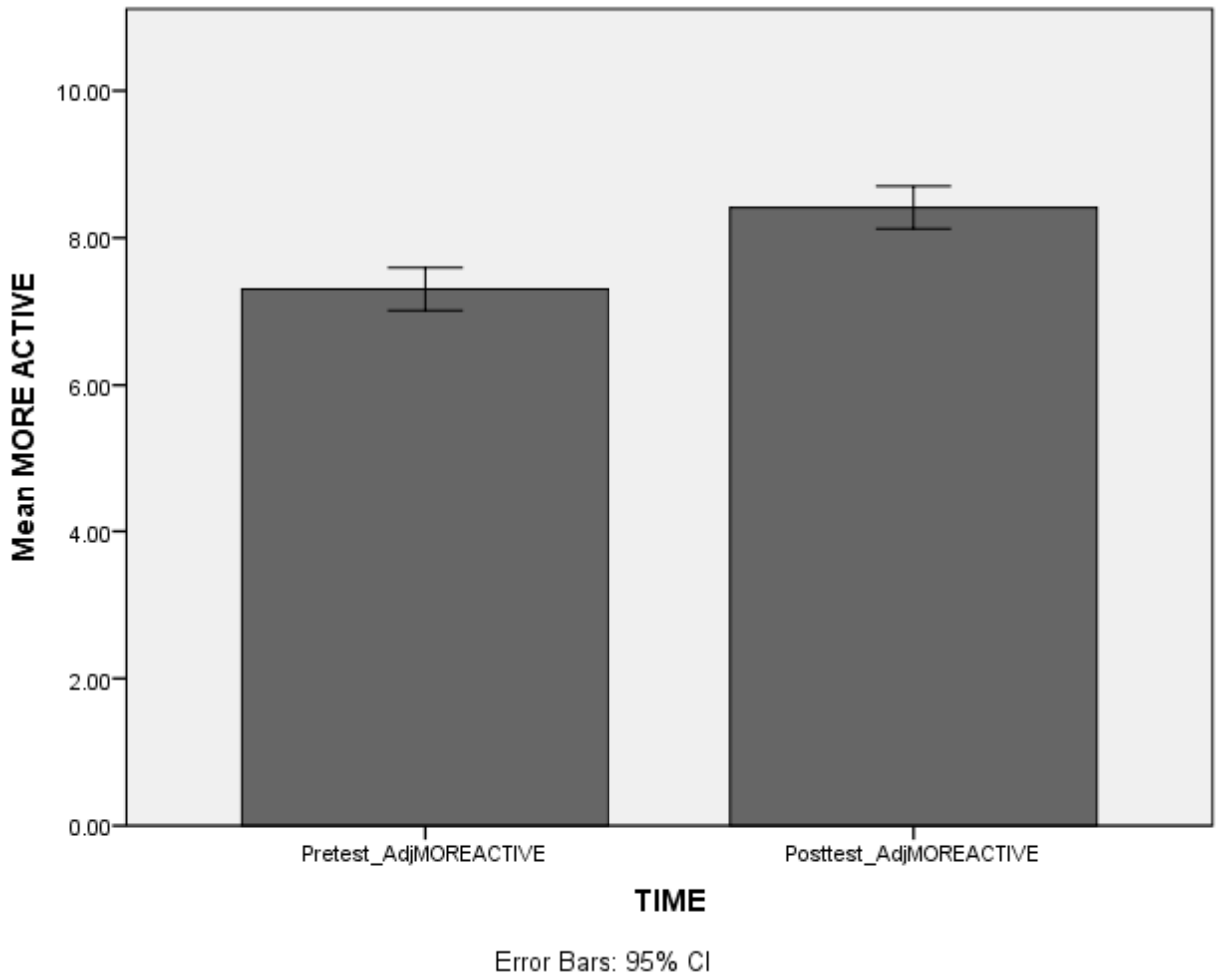

Figure 4. Mean changes in perceived self-efficacy in being physically active pre- and post CDSMP, $p < 0.001$

Perceived Self-Efficacy in Managing Stress. A dependent *t*-test was used to determine the statistical significance, if any, in the mean difference between participants' pre- and post- CDSMP perceived self-efficacy in managing stress. No extreme outliers were detected in a boxplot, and all data were included in the analysis. Participants' self-

efficacy in managing stress was statistically significantly higher post-CDSMP (8.13 ±1.166) than pre-CDSMP (7.04 ±1.897), $t_{45} = -3.797$, $p < .001$, 95% CI = -1.664, -.510 (See Table 3 and Figure 5).

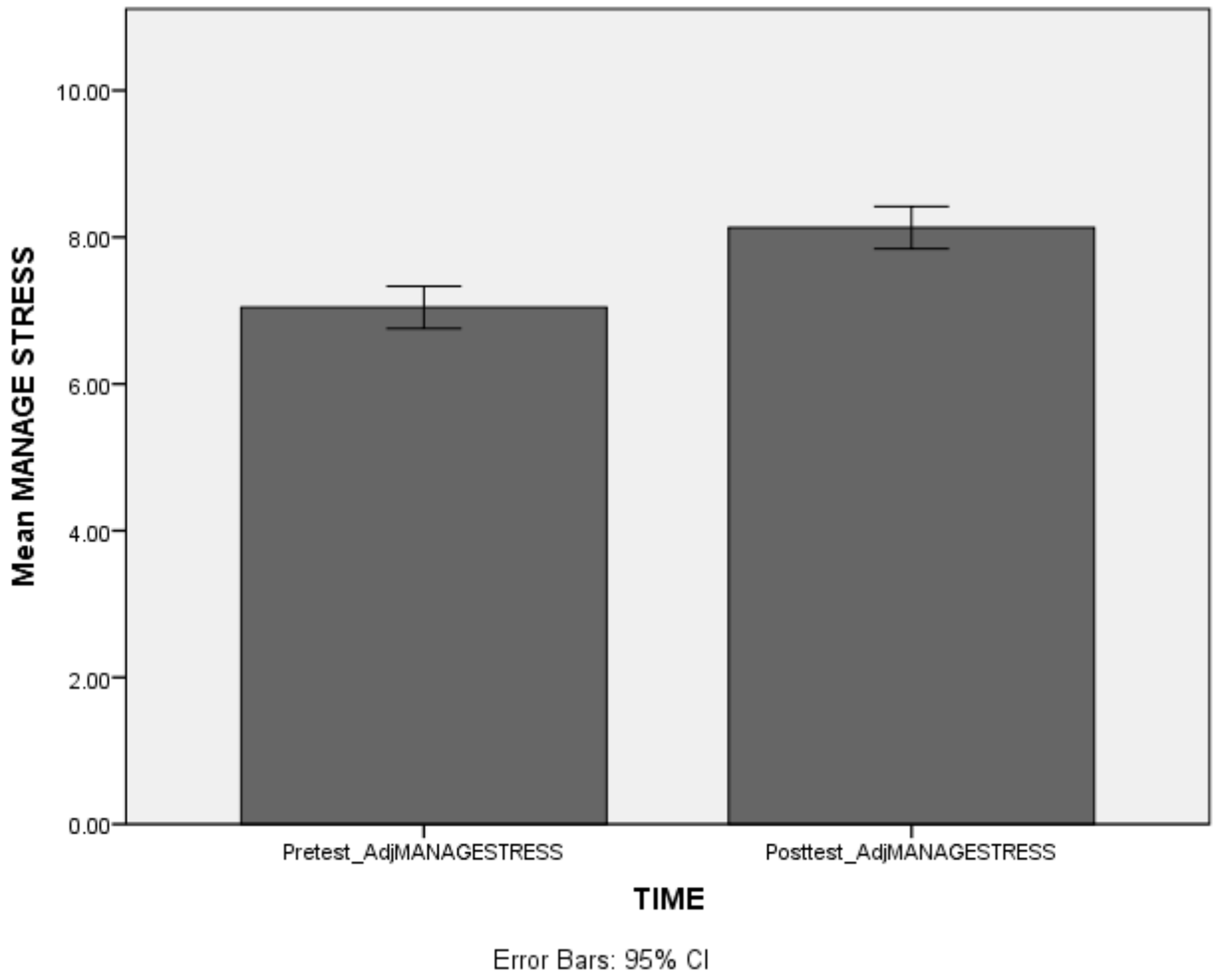

Figure 5. Mean changes in perceived self-efficacy in managing stress pre- and post CDSMP, $p < 0.001$

Perceived Self-Efficacy in Making Treatment Decisions. A dependent *t*-test was used to determine the statistical significance, if any, in the mean difference between participants' pre- and post- CDSMP perceived self-efficacy in making treatment decisions. No extreme outliers were detected in a boxplot, and all data were included in

the analysis. Participants' self-efficacy in making treatment decisions was statistically significantly higher post-CDSMP (8.28 ±1.148) than pre-CDSMP (6.48 ±1.975), t_{45} = -5.422, p <.001, 95% CI = -2.475, -1.134 (See Table 3 and Figure 6).

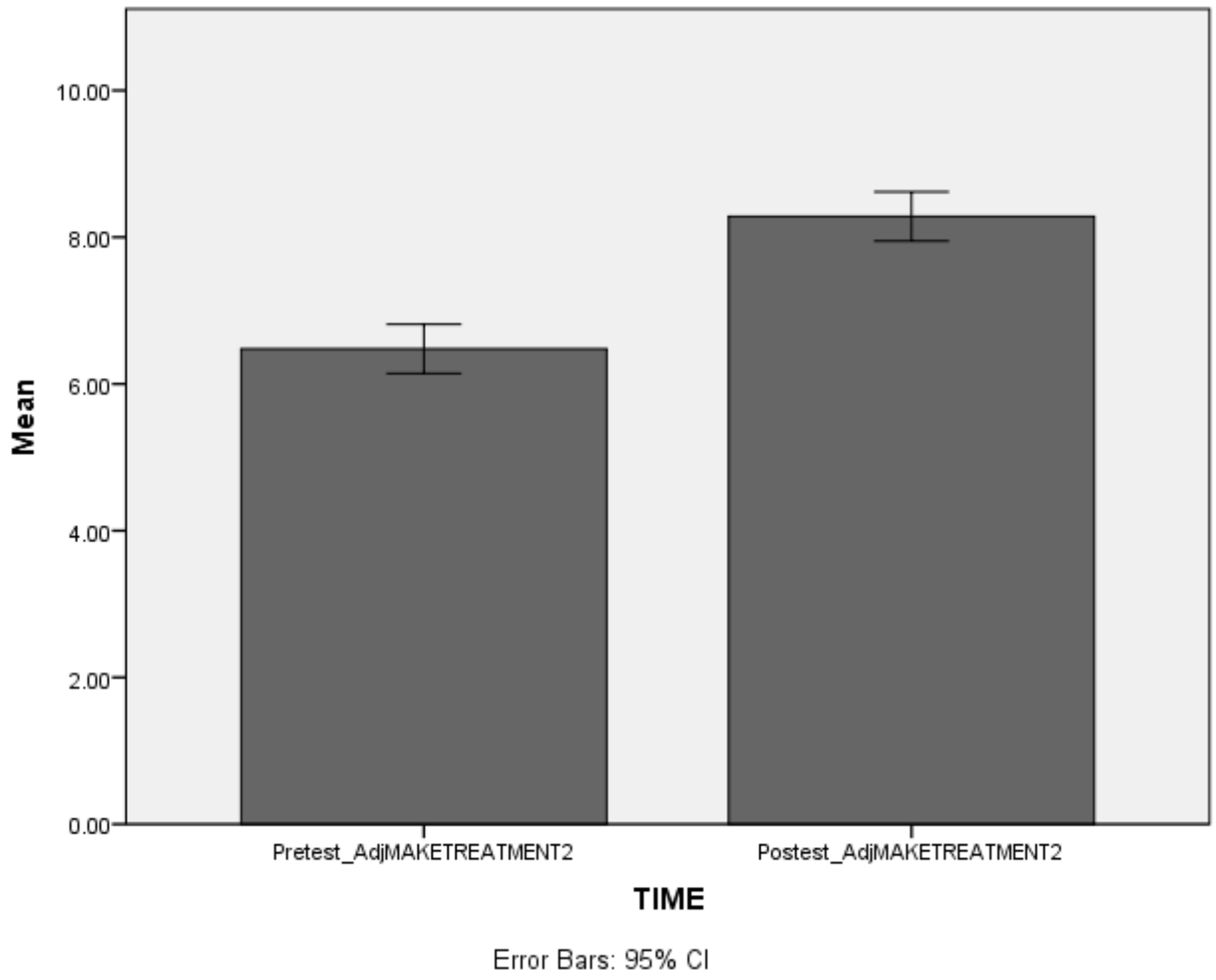

Figure 6. Mean changes in perceived self-efficacy in making treatment decisions pre- and post CDSMP, $p < 0.001$

Perceived Self-Efficacy in Taking Medications. A dependent *t*-test was used to determine the statistical significance, if any, in the mean difference between participants' pre- and post- CDSMP perceived self-efficacy in taking medications. No extreme outliers

were detected in a boxplot, and all data were included in the analysis. Participants' self-efficacy in taking medications was statistically significantly higher post-CDSMP (9.11 ±1.140) than pre-CDSMP (7.46 ±2.483), t_{45} = -4.337, p <.001, 95% CI = -2.419, -.885 (See Table 3 and Figure 7). Reported perceived self-efficacy was highest in this area.

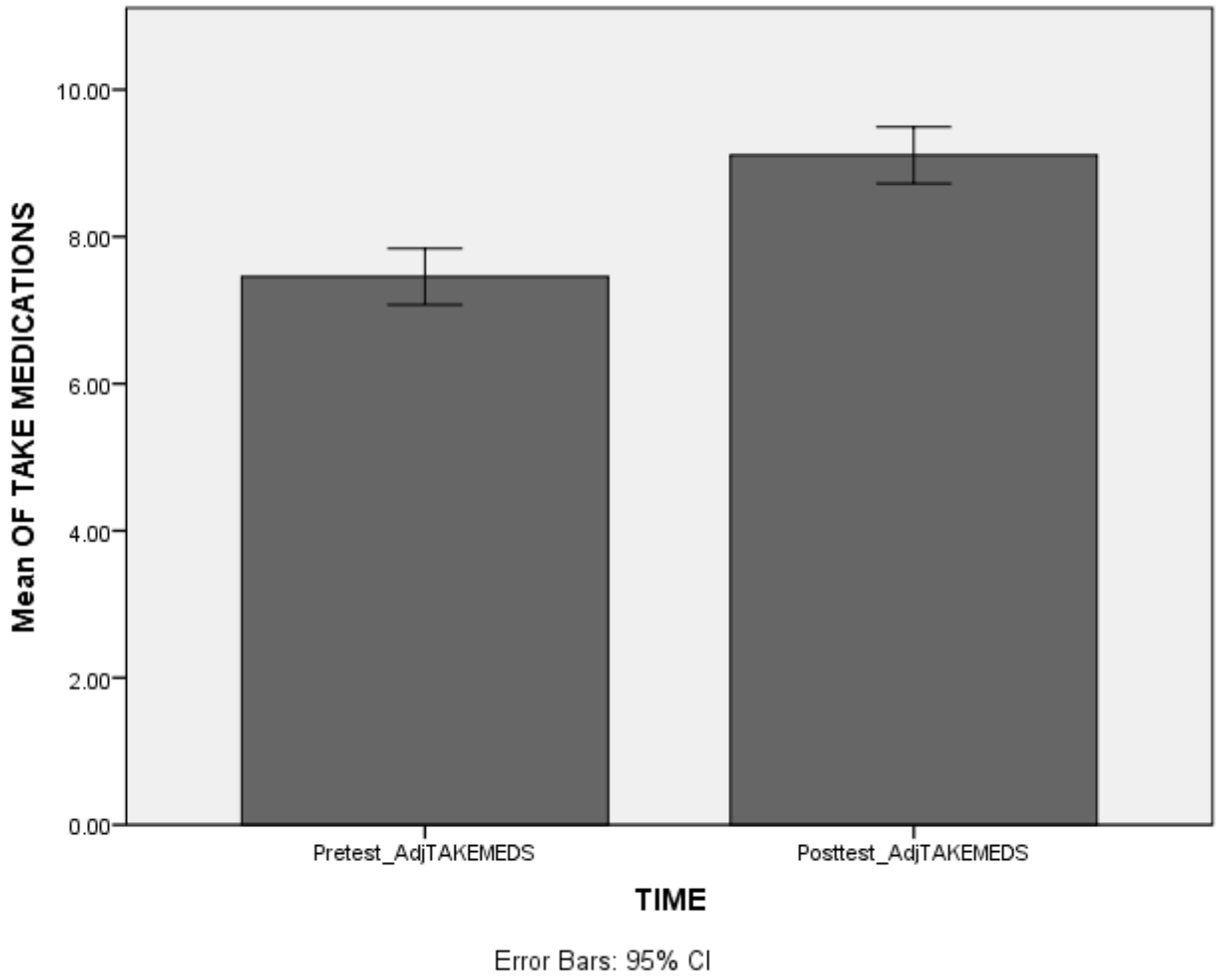

Figure 7. Mean changes in perceived self-efficacy in taking medications pre- and post CDSMP, $p < 0.001$

Perceived Self-Efficacy in Managing Pain. A dependent *t*-test was used to determine the statistical significance, if any, in the mean difference between participants' pre- and post- CDSMP perceived self-efficacy in managing pain. No extreme outliers were detected in a boxplot, and all data were included in the analysis. Participants' self-efficacy in managing pain was statistically significantly higher post-CDSMP (7.93 ±1.357) than pre-CDSMP (6.33 ±2.222), t_{45} =-4.755, p <.001, 95% CI = -2.290, -.927 (See Table 3 and Figure 8).

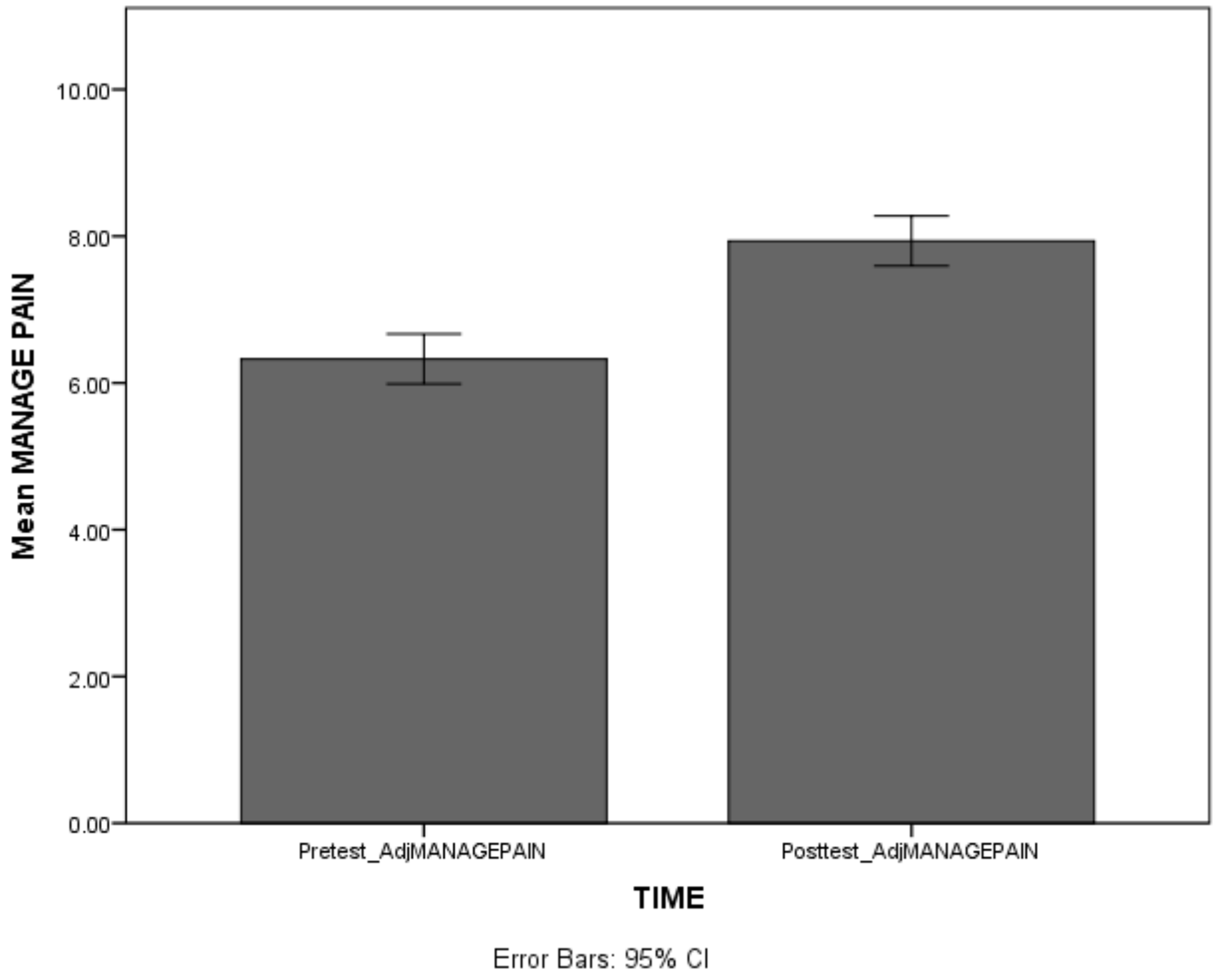

Figure 8. Mean changes in perceived self-efficacy in managing pain pre- and post CDSMP, p < 0.001

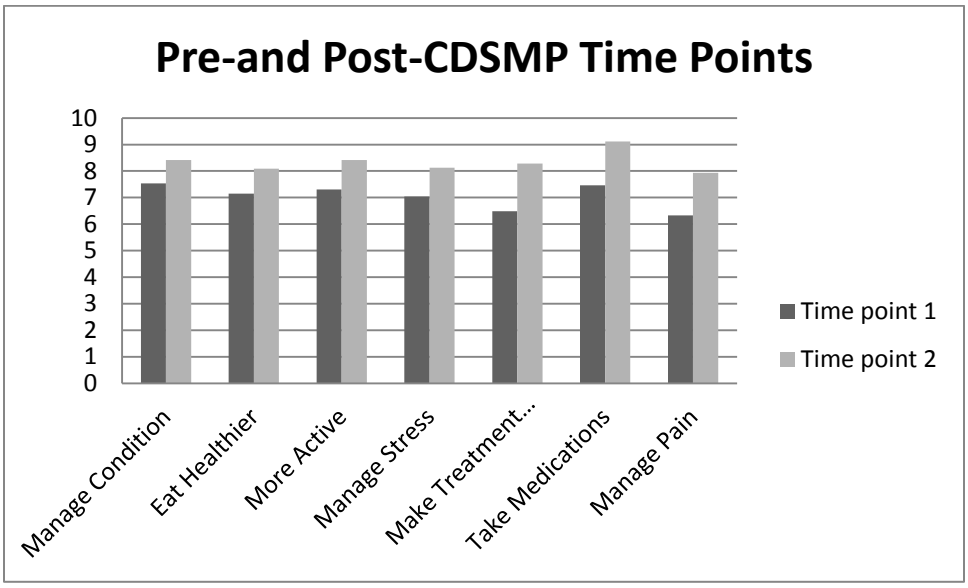

Figure 9. Comparison of pre-and post-CDSMP time points for all seven areas

Table 3

Dependent t-Test Table Suggesting Changes in Perceived Self-Efficacy in all Seven Areas Pre- and Post CDSMP; N = 46

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	pre-manage condition, post-manage-condition	-.870	1.996	.294	-1.462	-.277	-2.955	45	.005
Pair 2	pre-eat healthier, post-eat healthier	-.935	1.971	.291	-1.520	-.349	-3.217	45	.002
Pair 3	pre-more active, post-more active	-1.109	1.958	.289	-1.690	-.527	-3.841	45	.000
Pair 4	pre-manage stress, post-manage stress	-1.087	1.942	.286	-1.664	-.510	-3.797	45	.000
Pair 5	pre-make treatment decision, post-make treatment decision	-1.804	2.257	.333	-2.475	-1.134	-5.422	45	.000
Pair 6	pre-take medication, post take medication	-1.652	2.584	.381	-2.419	-.885	-4.337	45	.000
Pair 7	pre-manage pain, post-manage pain	-1.609	2.295	.338	-2.290	-.927	-4.755	45	.000

Summary

In this study, I focused on examining the effectiveness of the CDSMP in a sample of 46 adult participants in Southeast Missouri. Pre- and post- CDSMP data on seven self-reported perceived self-efficacy in self-management behaviors (i.e., managing condition, eating healthier, being physically active, managing stress, making treatment decisions, taking medications, and managing pain) were analyzed using a dependent *t*-test. The results suggest a correlation between the two time points, baseline and post-intervention, in each behavior, with perceived abilities to eat healthier and be physically active showing moderately stronger correlation than the other five behaviors. The dependent *t*-test identified significant differences in all seven areas, pre- and post- CDSMP, which supported all seven alternate hypotheses. The limitations and implications of these findings as well as future research recommendations will be presented in Chapter 5.

Chapter V: Conclusions, Implications, and Recommendations

Introduction

This chapter provides a summary of the findings on the effectiveness of the CDSMP among 46 individuals who are chronically ill in Southeast Missouri. The implications of this research professional practice, in the context of its limitations, are also examined. This chapter concludes with recommendations and directions for future research based on the results from chapter four.

Summary of Study

The purpose of this study was to analyze secondary data from the SEMORAC to determine the effectiveness of the CDSMP workshop (intervention) in improving chronic disease self-management behaviors in Southeast Missouri. Pre- and post-intervention measurements of perceived self-management behaviors in seven areas were taken at baseline (week one) and at completion (week six) to measure perceived efficacy in manage chronic disease, eat healthier, be physically active, manage stress, make treatment decisions, take medication, and manage pain. A correlation test showed varying degrees of positive correlations between the two-time points (baseline to post-intervention), ranging from .027 to .508, suggesting the perceived self-efficacy of program participants in all seven areas improved as they progressed through the 6-week CDSMP workshop. A dependent sample *t* test indicated significant differences between the two-time points for all seven perceived self-efficacy behaviors, with data showing statistically significantly higher post-CDSMP values than pre-CDSMP. These results suggest the CDSMP could be an effective intervention in improving chronic disease self-management behaviors among individuals who are chronically ill.

Limitations

A need exists to consider the results of this study in the context of its limitations. Data collection depended on the participants' abilities to recall precise information and self-report accurate information. This is a significant limitation as participants may have over-reported or under-reported data, resulting in inaccurate reporting about perceived self-efficacy behaviors. Questionnaires were the instruments of measurement and because I had no control over what the participants reported, there were tendencies to over-report self-reported data to meet the study's objectives because the respondents had an idea of what was expected of them in the post-intervention questionnaire. The history, natural development, or maturation of respondents over the 6-week duration of the CDSMP was also a limitation to this study because between the pretest and posttest, certain events could have transpired, which caused different and unintended outcomes that could have influenced the measurements and impacted the study's outcomes (Aschengrau & Seage, 2008; Campbell & Stanley, 1963; Hale, n.d.).

It is also important to note that because this was not a true experimental study, true causal inferences could not be made about the effectiveness of the CDSMP. Because this was a secondary data analysis, this study inherited the limitations associated with the SEMORAC dataset, which included a large number of cases that allowed for a reliable study of the population of interest populations, which, in turn, may affect the generalizability of the results to a larger population. Because the variables examined were limited to those available through the survey used, there could have been other unexamined variables of interest, which influenced perceived self-efficacy behaviors.

This study lacked a control group comprising of nonparticipants; this could have helped eliminate any validity threats related to the use of a single-group design.

A strong limitation is the fact that perceived self-efficacy may not necessarily result in behavior change. While some studies have identified a strong relationship between self-efficacy and behavior after an intervention (Neupert, Lachman, & Whitbourne, 2009), others have shown no correlation (Wendling & Beadle, 2015).

Despite these limitations, this study should still be considered beneficial and valuable because it suggests positive outcomes in various aspects of self-management using the CDSMP and could, therefore, be useful in promoting applied health education among individuals who are chronically ill.

Implications

This study demonstrated the effectiveness of the CDSMP in improving the perceived self-management behaviors among individuals who are chronically ill in Southeast Missouri. Because chronic diseases are leading causes or morbidity and mortality, as well as increased healthcare expenditure in the United States, evidence-based disease management initiatives, such as the CDSMP, which have the potential to not only improve health status and quality of life, but can also be cost-effective. When individuals who are chronically ill are empowered with the knowledge and skills necessary for managing their conditions, they understand their conditions even more, are fully involved, and better equipped to assume the responsibility needed to manage their own health (Farrell, 2008; Kralik, Paterson, & Coates, 2010). The CDSMP could be the key to achieving population-based disease management, especially among vulnerable populations. In hard-to-reach communities or remote communities with poor access to

healthcare providers, the CDSMP can be used with minimal adaptions, which makes it a right tool for promoting health and wellness.

Recommendations

Based on evidence taken at Week 6 of the CDSMP workshop and existing literature, some evidence suggests that the CDSMP is effective in improving self-efficacy among individuals who are chronically ill. Because it may be premature to measure the impact of the program accurately, it may be necessary to conduct a follow-up study at several intervals (e.g., three months, six months, and one year) to assess not just the true improvement in the mean perceived self-efficacy of self-management behaviors but also the long-term impact of the CDSMP.

Although it showed overall improvement in all seven areas, perceived self-efficacy did not provide an accurate picture of the frequency of healthcare utilization in this sample population. Participants may have improved in specific areas of self-management behaviors but still maintained the same frequency and amount of healthcare utilization. To better understand the benefit of the CDSMP in terms of healthcare utilization, it may be necessary to collect data on frequency of disease exacerbations and healthcare utilization during follow-up studies.

Experts have argued that it has become increasingly important to support self-management programs when considering the delivery of health care services for patients with chronic diseases, especially those with multiple co-morbidities (Ritter, Ory, Laurent, & Lorig, 2014). Beyond their roles in providing direct patient care services, healthcare providers, especially physicians, should identify opportunities to refer individuals who could benefit from the CDSMP. The CDSMP may work best when integrated as part of

the healthcare system, especially primary care (Kreindler, 2009). High-need, high-cost patients can benefit significantly from the CDSMP and may require multidisciplinary collaborative care planning to ensure the workshop is part of their transitional care post-hospitalizations. As a key part of their routine services, healthcare professional can also help link individuals who are chronically ill with community-based CDSMP workshops.

Several studies have identified challenges to recruit and retain specific populations of interest (i.e., minorities, rural communities, low-literacy individuals, immigrants, and HIV patients) for the CDSMP (Health Council of Canada, 2012). To address this problem, it may be helpful to present materials at a level that better meets the target population's learning needs. There may also be a need to adapt the CDSMP to be more culturally/linguistically-appropriate for the population of interest. The recruitment and training of lay leaders who also suffer from chronic diseases and who are essential to these communities, may help with the receptivity of the CDSMP. Because they are a part of the community they educate, these lay leaders are better equipped to act as cultural bridges, providing CDSMP content in their native language as needed (Aguilar-Gaxiola et al., 2012; Rhodes, Foley, Zometa, & Bloom, 2007).

Conclusion

This study showed that the CDSMP was effective in improving perceived self-efficacy in chronic disease self-management behaviors for seven aspects (i.e., manage diseases, eat healthier, be physically active, manage stress, make treatment decisions, take medication, and manage pain) among individuals who are chronically ill. The findings of this study are consistent with those of existing literature, which focused on the effectiveness of the CDSMP, and, therefore, it is relevant to conclude there are inherent

benefits to this program, specifically in improving self-efficacy in self-managing chronic diseases/health conditions. By improving the self-efficacy of self-management behaviors, the CDSMP will not only help improve patients' outcomes, but also reduce overall medical utilization and expenditure.

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Appendix A

____Pre ____Post Race: ____ County: _____

PARTICIPANT' S WORKSHOP EVALUATION FORM

Thank you for participating in our Living a Healthy Life Workshop. Please help us improve our program by filling out this evaluation form. You need not identify yourself. For each of the following questions, please choose the number that corresponds to your confidence that you can do the tasks regularly at the present time.

How confident are you that you can……											
1. Manage your condition?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
2. Make an action plan?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
3. Problem solve?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
4. Communicate with your doctor?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
5. Deal with difficult emotions?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
6. Eat healthier?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
7. Be or stay more active?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
8. Manage your stress?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
9. Make treatment decisions?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
10. Remember to take medications?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
11. Manage pain?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident
12. Manage your fatigue?	Not at all confident	1	2	3	4	5	6	7	8	9	10 Totally confident