AN EXPLORATION OF SELF-EFFICACY AMONG OLDER ADULT PARTICIPANTS IN A
DISEASE SELF-MANAGEMENT PROGRAM

by

KATHLEEN CAHILL GRAHAM

(Under the Direction of Matthew Lee Smith)

ABSTRACT

Introduction

Both age and chronic disease have been linked to falls, injury due to falls, and decreased functional status. Stanford’s Chronic Disease Self-Management Program (CDSMP) is an evidence-based program that uses self-efficacy (SE) as a key program component to improve self-management of chronic disease. CDSMP shares similar course structure, content (including a 10-minute segment on fall prevention), and focus on self-efficacy (SE) with fall prevention programs (FPP). Despite these program commonalities, researchers had not yet investigated Fall-related SE in relation to CDSMP participation. This dissertation investigated possible relationships between SE to manage disease (SEMCD) and Fall-related SE, whether Fall-related SE changed following participation in CDSMP, and older adult perception and understanding regarding (SEMCD) and Fall-related SE.

Methodology

A sequential mixed methods design explored older adult perceptions regarding self-efficacy and CDSMP. **Phase 1 SE scale collection:** Researchers gathered and analyzed baseline and post-intervention self-efficacy scale data from 36 participants enrolled in a six-week CDSMP. The six-question Self-Efficacy to Manage Chronic Disease scale (SEMCD Scale) and the five-question Fall-related Self-Efficacy scale (FallE Scale) measured relationships between types of SE as well as post-intervention changes in SE. **Phase 2 interviews:** 15 older adults (65 or older) completed semi-structured
interviews following CDSMP participation to explore meanings and perceptions made by older adults regarding SE and self-management of health.

Results

Phase 1: SE scales were reliable (consistent with previous studies), distinctly different, and yet related measures of SE. Only the Fall-related SE significantly improved in proportion of participants and magnitude of change following CDSMP. Phase 2: The conceptual category, Believing I can do emerged as an overarching concept. Impact of CDSMP on SE was perceived as a general type of efficacy, SE to manage health, represented by overlapping or general aspects of self-management. The metacategories Giving Me More and Reinforcing what I know represented the perceived impact of CDSMP on SE from a general rather than specific perspective.

Conclusions

Although, SEMCD and Fall-related SE were distinct types of SE, correlations and mixed analysis indicated that Fall-related SE may share a common connection to SEMCD through the broader aspects of managing health provided during CDSMP workshops.

INDEX WORDS: Healthy aging, self-management, chronic disease, self-efficacy, mixed methods, pragmatism, fall prevention
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A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2016
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May 2016
ACKNOWLEDGEMENTS

I would like to thank everyone who has supported me through this journey especially my husband, children, sisters, parents, as well as Brenau University faculty and staff in the School of Occupational Therapy. In particular, I would like to thank the professors in the Department of Health Promotion and Behavior, and my qualitative and gerontology professors for creating an environment to grow and learn about public health, health promotion, self-management, and aging well. Special thanks to my committee members, Drs. Hall, Emerson, Wilson, and my chair, Dr. Smith for their guidance and mentorship.
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CHAPTER 1
INTRODUCTION

Problem Statement with Key Issues Identified

Aging adults face increased risk of chronic disease, disability, and related issues such as falls (West, Cole, Goodkind, & He, 2014). The financial and physical toll of chronicity of disease is overwhelming from both individual and societal perspectives; almost half of adults in the US report at least one chronic disease (Ward & Schiller, 2013), and the number of adults facing chronic disease increases sharply to eighty-five percent of those sixty-five and older (Anderson & Horvath, 2004). Seventy-five percent of healthcare dollars are spent managing chronic disease (Anderson & Horvath, 2004). Older age and multiple chronic diseases are also associated with increased risk of falls, injury, and death due to falls (Barbour et al., 2014; Stevens, Mack, Paulozzi, & Ballesteros, 2008; Stevens & Rudd, 2014). Direct effects of disease as well as indirect issues such as weakness, curtailed engagement and balance issues increase risk of falls (Lawlor, Patel, & Ebrahim, 2003). In addition, the financial cost of falls increases with age with cost of falls with injury doubling between the 65-74 and 75-84 age groups (Stevens, Corso, Finkelstein, & Miller, 2006). Prevention and effective self-management must be considered in addition to medical management to address the negative effects of chronic disease and falls (Bauer, Briss, Goodman, & Bowman, 2014; Holman & Lorig, 2004). Self-management provides a critical component to the health of all adults especially those older adults facing more chronicity and decreased function.

To address the issues of chronic disease and falls, national, state and community agencies are partnering to provide evidenced-based prevention and self-management programing such as Stanford’s Chronic Disease Self-Management Program (CDSMP) and fall prevention programs (FPP) such as A Matter of Balance/Volunteer Lay Leader (AMOB/VLL) to middle age and older adults (Anderson & Prohaska, 2014; Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002; Ory & Smith, 2013). Disease
self-management programs and FPP share program core content such as fall prevention, environmental and home safety, exercise training, safe medication use, general problem solving, and healthcare provider communications (Lorig, Gonzales, & Laurent, 2012; Ory et al., 2010). Fall programs typically work to decrease risk for falling by changing the environment, promoting strengthening and balance activities, reviewing issues with medications, and teaching goal setting (Ganz, Alkema, & Wu, 2008). These content areas are also covered as part of CDSMP (Lorig, Sobel, et al., 2001). In the newest version of CDSMP, a short fall-related component was specifically added (Lorig, Gonzalez, & Laurent, 2012), yet no identified research has addressed CDSMP and fall prevention.

Self-management can be defined as a person’s daily management of chronic disease, risk factors and general health (Lorig & Holman, 2003; Ryan and Sawin, 2009). CDSMP researchers have conceptualized three main self-management tasks: medical management, role management, and emotional management (Lorig & Holman, 2003). CDSMP uses a six-week standardized workshop format that addresses six main self-management skills: problem solving, decision making, resource utilization, forming partnerships with healthcare providers, action planning, and self-tailoring (Lorig & Holman, 2003). Trained lay leaders teach these skills during weekly sessions. Participants apply these general self-management skills during each week of the workshop using action plans and goal setting. Program outcome measures are generally quantitative-based, self-reported measures such as: number of healthy days, number of days in hospital, number of visits to health provider, exercise frequency, medication use as well as changes in SE to manage disease (Lorig, Sobel, et al., 2001).

SE, defined as the confidence in one’s ability to do a task, is considered a key aspect of self-management and CDSMP since it is a strong predictor and shaper of behavior (Bandura, 2004). CDSMP focuses on improving the participants’ self-efficacy to manage chronic disease (SEMCD) as a key program focus (Lorig & Holman, 2003; Ritter & Lorig, 2014). CDSMP uses activities designed to enhance SE through opportunities for performance mastery, modeling, interpretation of symptoms, and social persuasion (Bandura, 1997; Lorig & Holman, 2003).
In a similar manner, the fall management and prevention program, AMOB/VLL, promotes Fall-related SE as a core program construct and measure (Smith, Jiang, & Ory, 2012). Fall-related SE has been defined in AMOB/VLL research as the confidence in one’s ability to prevent or manage falls (Smith et al., 2012a). AMOB/VLL uses cognitive re-structuring, feedback, and action plans in a group setting to promote Fall-related SE based on the program designed by Tennstedt et al., (1998). CDSMP and FPP both strive to promote SE while promoting basic processes of self-management. CDSMP focuses on skills to manage conditions to promote SEMCD. FPP, such as AMOB/VLL, promote Fall-related SE through by learning strategies to manage and prevent falls.

Self-efficacy is best measured using very specific scales related to a range of aspects of a task such as a scale for managing disease or a scale for managing and preventing falls (Bandura, 1997). Both CDSMP and AMOB/VLL have developed reliable SE scales as measures specific to the program management focus (Ritter & Lorig, 2014; Smith, Jiang, & Ory, 2012). These two scales were chosen as measures for this dissertation. The six-item Self-Efficacy to Manage Chronic Disease Scale (SEMCD Scale) was utilized to capture perceptions of ability to manage conditions associated with chronic disease. The five-item Fall Efficacy Scale (FallE Scale), used commonly in AMOB/VLL research (Smith, Jiang, & Ory, 2012), was used to measure confidence to manage and prevent falls.

Statement of the Problem

Chronic conditions and falls are issues that have multiple intersecting effects in aging populations (West, Cole, Goodkind, & He, 2014; (Lawlor, Patel, & Ebrahim, 2003). In a recent opinion article, Beattie (2015) advocated for fall prevention to be incorporated into managing chronic conditions for aging adults. While these issues are addressed separately in a complimentary fashion through programs such as CDSMP and AMOB/VLL, EBP have not effectively addressed the possible interconnections between chronic disease and fall management. CDSMP has partially addressed these interconnections by adding a short, 10-minute section on fall prevention and balance, but the possible effect of CDSMP on Fall-related SE had not been investigated.
Purpose of this Research

This study provided an initial exploration of the relationship between SEMCD and Fall-related SE at baseline and post-CDSMP intervention. This dissertation used an integrative mixed methods approach (mixing quantitative and qualitative methods at the design, data collection, and analysis as described by Greene (2007). This approach signaled a willingness via design and practical orientation to look within the complexity of older adult experiences. For this research, Phase 1 used pre-existing and validated SE scales to measure or compare efficacy types at baseline and post-intervention for participants who completed CDSMP workshops. While this initial comparison was critical to understand the potential relationship and overlap between these types of efficacy, such objective scales failed to capture the perceptions and understandings surrounding types of efficacy from program participants. As such, Phase 2 used interview methods to permit a deeper exploration of any possible relationships between SEMCD and Fall-related SE and CDSMP participation. Early quantitative scale data then informed development of interview questions for the semi-structured interviews. The developmental process was needed since no known research had explored possible relationships and changes in Fall-related SE had not yet been explored. To more fully understand older adults’ understandings about possible relationships between SEMCD, Fall-related SE, and CDSMP, both quantitative and qualitative methods were needed. Such mixed method integration enhanced opportunities to understand the complex issues (Greene, 2007) of this largely unexplored area.

Significance of the Study

This research permitted a first exploratory step to explore older adults’ perceptions relating to changes in SEMCD and Fall-related SE following participation in CDSMP. In order to develop more effective programming for older adults, older adults’ perceptions of SE and self-management as they relate to chronic disease and falls must be better understood. Considering use of CDSMP as a precursor before more specific FPP might enable participants in CDSMP programs to gain knowledge, skills, and SE in a supportive environment to improve general self-management behaviors and perhaps even Fall-related SE. Although CDSMP has been translated and generalized to a variety of diseases, cultures, and
contexts (Ory, Smith, et al., 2013), considerations of possible fall-related applications remain underexplored. In addition, researchers in the complimentary domains of disease self-management and fall management and prevention have both established the importance of SE in self-management, but the possible connections between SEMCD and Fall-related SE had not yet been explored. Research in this area supports the “no wrong door approach” for falls advocated by Ganz et al. (2008) as well as Beattie’s (2015) call to broaden disease management to include fall prevention.

**Research Questions**

This research provided an exploratory approach to consider inter-relationships between three important aspects of promotion of health and self-management: chronic disease prevention, fall prevention, and self-efficacy. Using a sequential, mixed-methods methodology, the dissertation addressed the following research questions:

- How are the concepts of self-efficacy to manage chronic conditions (SEMCD) and self-efficacy to manage/prevent falls (Fall-related SE) related before and after participation in a self-management program? (primarily quantitative)
- How does participation in a self-management program impact older adult perceptions of self-efficacy to manage or prevent falls (Fall-related SE) as compared to their perceptions self-efficacy to manage chronic conditions? (mixed)
- How do older adult participants understand relationships between self-efficacy to manage chronic conditions (SEMCD) and self-efficacy to manage/prevent falls (Fall-related SE) following participation in a self-management program? (mixed)

**Definitions of Key Terms**

**Chronic Disease**

Chronic disease has been defined many different ways but generally includes duration of at least three months (many use one year as requirement) and it also generally includes an expectation of functional limitations. (Goodman, Posner, Huang, Parekh, & Koh, 2013).
Competence

Competence for an action or task arises from a combination of skills and self-efficacy (Bandura, 1997). Competency increases when a person gains skills and successfully meets goals for action (Bandura, 1986).

Fall-Related Self-Efficacy (Fall-related SE)

This form of efficacy has been defined as the confidence in ability to prevent or manage falls (Smith, Jiang, et al., 2012; Smith, Ahn, et al., 2012). A key phrase here is prevent or manage; this means that not all falls can be prevented, but if a fall happens, a person can still have the belief they can exercise control over the situation.

Self-Management

Self-management can be defined as a person’s daily management of chronic disease, risk factors and general health (Lorig & Holman, 2003; Ryan and Sawin, 2009). It can be conceptualized as three main management tasks: medical management, role management, and emotional management (Lorig & Holman, 2003). The term self-management can describe: the processes of self-management (using skills in self-regulation such as action planning and managing responses to manage both disease and risk factors); the programs of self-management such as CDSMP designed as interventions help people gain the skills to manage illness or general health; and the outcomes of self-managing such as better control of blood sugar (Ryan & Sawin, 2009).

Self-Management Support

Self-management support is the support health educators and health care professionals provide for those engaged in the process of self-management to “acquire and maintain the knowledge, skills, and confidence to do what they need to do to live as well as possible with their chronic conditions(s)” (Brady, Anderson, & Kobau, 2015, p.53).

Self-Efficacy

Self-efficacy is defined as a person’s belief in his or her ability to do a certain task or to exercise control over a certain event. It can affect peoples’ expectations of outcomes and can influence “almost
everything they do: how they think, motivate themselves, feel, and behave” (Bandura, 1997, p. 19). Self-efficacy is about what a person thinks she can do rather than what she will do (Bandura, 1997).

**Self-Efficacy to Manage Chronic Conditions (SEMCD)**

SEMCD is defined as the belief or confidence in one’s ability to manage his or her chronic condition or multiple conditions (Ritter & Lorig, 2014).

**Summary**

As they age, adults face increasing pressure from the often intersecting issues of chronic disease and falls. EBP typically address these issues using complimentary approaches that promote knowledge, skills, and SE in managing conditions (CDSMP) or managing/preventing falls (AMOB/VLL). Researchers and those in the field of public health have called for a more integrated approach to address chronic disease and falls (Beattie, 2015). Research, understanding and application regarding chronic disease and falls typically remains oriented along complimentary yet parallel tracks for managing disease and managing falls as can be seen with the articles in the recent publication, *Evidenced-Based Practice for Older Adults* (Ory & Smith, 2015). It appears that CDSMP has begun to address the possible intersecting content and population between chronic disease and falls with the 2012 CDSMP standardized manual addition of a short section on fall prevention and balance to the second session (Lorig, Laurent, &Gonzalez, 2012). With this newer fall and balance segment and the potential intersection between having chronic disease(s) and being at risk for falls in aging adults, CDSMP may have the potential to impact self-efficacy regarding falls in much the same way it impacts self-efficacy to manage chronic conditions. SE was chosen as the focus for this dissertation due to its pivotal role in both CDSMP and FPP such as AMOB/VLL. The sequential, mixed method approach used in this research facilitated that exploration of possible relationships between SEMCD and Fall-related SE. In addition, research explored the impact of CDSMP participation in relation to Fall-related SE.

Chapter 2 provides a review of the literature regarding the impact of chronic disease and falls in the aging adult, healthy aging, and general concepts of self-management. CSDMP is explored as a program and then viewed specifically as it applies to SE. SE and routes to affect SE are discussed using
Bandura (1997) as the main theoretical reference. Basic fall prevention strategies such as those used in AMOB/VLL are clarified to create a better understanding of possible overlapping content with CDSMP. Participants’ perception of FPP provides important understanding of how older adults view falls and FPP. Finally, the review of literature concludes with introduction to the problem from a pragmatic perspective and establishes the research questions addressed in this dissertation.

Chapter 3 presents the focus of Phase 1 quantitative research in a manuscript entitled: “Exploring Fall Self-Efficacy Outcomes Following Participation in a Chronic Disease Self-Management Program”. Chapter 4 presents the Phase 2 interview-based research within an integrated mixed methods approach that used the Phase 1 quantitative data to initially inform and then later complement the qualitative interviews to better understand the relationship of SE and CDSMP. The chapter is entitled: “A Mixed Method Approach to Understanding the Impact of Older Adult CDSMP Participation on Self-Efficacies to Manage Falls and Chronic Disease.” Chapter 5 presents overviews of both studies, addressing methodological and conceptual concerns in depth, describes the dissertation relation to research and practice in the field of health promotion, and suggests future research directions.
CHAPTER 2

REVIEW OF LITERATURE

Introduction

According to Ory, Smith, and Resnick (2012), “there is a growing recognition of the need to fundamentally shift our thinking about aging from a societal problem to an opportunity for advancing knowledge about strategies for promoting health in later life” (Ory et al., 2012, p. 159). Aging adults face increased risk of chronic disease and injury and death due to falls as well as ever-rising costs due to these conditions (Anderson & Horvath, 2004; Stevens et al., 2006; Stevens et al., 2008). According to a recent report, chronic disease represents the “undisputed” challenge to public health in the US and across the world (Bauer et al., 2014). The authors identified this challenge as the “burden of chronic disease” and identified three contributing key issues: high prevalence of risk factors (from lifestyle to disease), social and economic health disparities, and more people living longer with more conditions. According to Bauer et al. (2014), the CDC seeks to address these problems via a four part approach: epidemiologic support for trends and program monitoring; environmental approaches to address context and support health behaviors; improved health system interventions; and “community resources linked to clinical services (to) sustain improved management of chronic conditions” (p. 45). While all these approaches are important to effective prevention, this current dissertation focuses on the authors’ recommendations to using community resources to help improve self-management of health in middle age and older adults.

Bauer et al. (2014), Ory et al. (2013c), and (Lorig & Holman, 2003) promote the use of standardized self-management programs such as CDSMP in the community across ages due to their well-researched benefits for health. Programs like CDSMP provide benefits such as enhanced knowledge and skills to manage health, improved QOL, improved self-efficacy, and decreased patient use of ER services (Lorig, Ritter, et al., 2001). Social cognitive theory (SCT) and its construct of SE provide theoretical foundations for many self-management programs (Bandura, 1998); SCT should be considered in terms of
interactions with the behavior, personal factors, and the environment. SE, then, acts as a main mechanism to improve self-management of health as well as a program outcome (Lorig & Holman, 2003; Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001). Chronic disease self-management programs (CDSMP) and fall prevention programs (FPP) often reflect similar program content such as environmental safety, safe medication use, diet, the importance of exercise, and goal setting (Clemson, 2009; Davis, Marra, & Liu-Ambrose, 2011; Smith, Jiang, & Ory, 2012; Stevens, Noonan, & Rubenstein, 2010). Despite these commonalities in content, no researchers have addressed the potential program overlap between CDSMP and FPP especially in relation to SE.

This review of literature will highlight issues with chronic diseases especially as they relate to older adults and to fall-related issues. Healthy aging and self-management concepts will be explored as methods to address these issues associated with chronic disease and falls. Then, a description of CDSMP and program effects will follow with a special emphasis on outcomes related to SE. Theoretical explanation of the role of social cognitive theory and SE in relation to self-management will follow. The final section of this chapter discusses the stance of pragmatism and the use of mixed methods to address the research questions.

**Search Method and Criteria**

Using the UGA library database, EBSCO search engine, the data bases Medline, ERIC, CINAHL, Psychology and Behavioral Sciences Collection, and PsycINFO were searched using subject/key word searches as well as exploration of main subject headings for CINAHL and MEDLINE terms. Individual subject key word searches were performed for “chronic disease self-management,” falls or “fall prevention,” AND self-efficacy, and later exercise. Nothing was identified using this search. Dropping the falls and exercise terms, the search was completed again, 86 articles were identified using chronic disease self-management AND self-efficacy key subject terms. A final search in the same data bases expanded search parameters slightly used subject/key words self-management AND self-efficacy AND outcomes in order to better capture the breadth of the literature. Additional topical searches and reviews were completed for “successful aging,” “healthy aging,” fall prevention AND self-efficacy, self-
management and self-efficacy, frailty AND self-efficacy, mixed methods AND health-promotion, pragmatism. Toward the end of the research as part of the analysis, searches were updated and additional searches were completed regarding “self-management support” and “self-efficacy to manage health.” In addition, reference lists and table of contents for health-related journals were also scanned for topical connections. No specific criteria were set in terms of timeline or publish date. Peer-reviewed journals were preferred source of information but others sources provided a more complete picture of the issues and so were included.

**Impact of Chronic Disease**

**Modifiable Risks of Chronic Disease**

We are always aging; however this process becomes more noticeable as our cells and nervous systems change with the inevitable processes associated with aging (Thompson, 2009). As a result, our bodies lose muscle mass, lose neurons, produce less neural-transmitters, lose elasticity in heart and lungs yet gain stiffness in locations such as ribs which then inhibits breathing and chest expansion (Dean & Doneles de Andrade, 2008). All of these things can contribute over time to increased risk of chronic disease. Ory, Anderson, et al. (2014) called midlife a “watershed” when the past experiences and exposures collide with current loss of cells and support. It is during this time that those in midlife commonly begin to experience the first signs, symptoms and issues of chronic disease. Chronic disease has been defined many different ways but generally includes duration of at least three months (many use one year as requirement) and it also generally includes an expectation of functional limitations (Goodman et al., 2013). Despite the inevitable aging process, much can be done to minimize risk and severity of chronic disease. Bauer et al. (2014) indicate acting at individual and population levels will ease the crisis:

The chronic disease burden in the USA largely results from a short list of prevalent risk factors—including tobacco use, poor diet and physical inactivity (both associated with obesity), alcohol consumption, uncontrolled high blood pressure, and hyperlipidemia—which along with access to medical care are inequitably distributed. (p.46)
According to the authors, many of these risks can be addressed. Some risks require more policy level changes such as smoking bans. The recent changes to Medicare funding for wellness visits should facilitate health promotion (Ory et al., 2012). Many of these modifiable risk factors can also be addressed through self-management and engagement in programs such as Stanford’s Chronic Disease Self-Management Program (CDSMP) to learn the skills of self-management (Bandura, 2004; Lorig & Holman, 2003). In addition, the health disparities that create the “inequitable distribution” mentioned by (Bauer et al., 2014) must be addressed at any age group, but especially in the aging population.

Prevalence and Cost of Chronic Disease

Across developed nations there has been a fundamental shift in attention from managing acute illness to preventing and containing the impact of chronic disease (Anderson & Horvath, 2004; Clark, 2011). Ward, Schiller, and Goodman (2014) noted almost half of non-institutionalized US adults (49.8%, 117 million) had at least 1 of 10 selected chronic conditions in 2012, and one in four adults had two or more chronic health conditions (Ward & Schiller, 2013; Ward et al., 2014). Reporting on data from the National Health Interview Survey, these authors noted older adults have higher rates of chronic disease and numbers of conditions compared to middle age adults. According Gerteis, et al. (2014), 80.1% of those 65 years and older more than one chronic condition. The 2010 Medicare data showed that fifty-three percent of all beneficiaries had two or more conditions while eighty-three percent of those beneficiaries eighty-five and older had multiple chronic conditions (Centers for Medicare and Medicaid Services, 2012). The numbers provide an even grimmer picture when viewed with the costs of managing chronic disease.

In addition to high prevalence of chronic disease, of the top ten 10 causes of death in 2010, seven were associated with chronic disease (Centers for Disease Control and Prevention [CDC], 2014). The five most common chronic diseases for Medicare recipients were hypertension, high cholesterol, heart disease, arthritis, and diabetes in 2010 (Centers for Medicare and Medicaid Services, 2012). The costs of managing chronic disease are staggering. Gerteis et al. (2014) reviewed 2010 MEPS data (Medical Expenditure Panel Survey) for a large non-institutionalized sample of the US population. Spending
analysis showed 71 percent of healthcare dollars were spent on managing chronic conditions. The numbers and costs associated with this data actually represent underreporting the full extent of costs since those adults in institutions were excluded from the statistics. In 2010, of those Medicare recipients with zero or one chronic conditions, spending was 20 billion. Yet the fourteen percent of beneficiaries with six or more conditions accounted for 140 billion Medicare dollars (Centers for Medicare and Medicaid Services, 2012).

This same data from 2010 Medical Expenditure Panel Survey (MEPS) used classification codes to determine impact of chronic disease by use of services, by age, and by numbers of conditions (Gerteis, et al., 2014). Chronic disease for this analysis was defined as being expected to last longer than a year and result in functional limitations and/or the need for medical care (Gerteis, et al., 2014), those with chronic conditions accounted for most of the use of medical care especially for those with two or more conditions; for example 87.5 percent of all home health use was attributed to those with at least two chronic conditions. From this data, it is clear that chronic disease is an all too common issue for adults but most especially for older adults. Specifics regarding chronic disease and multiple chronic conditions will be addressed next.

Lochner, Goodman, Posner, and Parekh (2013) completed a state by state analysis of Medicare use for beneficiaries with multiple chronic conditions; overall in 2011, states spent an average $9,436 dollars per beneficiary but that increased to $31,543 dollars for those with six or more chronic conditions. In 2011, 67.3% of Medicare beneficiaries had at least two chronic conditions while 14% were coded as having six or more conditions. Most (82.6%) Medicare users were 65 and older. Georgia-specific Medicare data showed 69.1% of Medicare recipients have at least 2 chronic conditions while 13.5% were coded as having six or more conditions (Lochner et al., 2013). According to Medicare spending data cited by Lochner et al. (2013), those with 6 or more conditions (just 13.5% of the Medicare beneficiaries) accounted for “almost half the total Medicare spending” (p. E2). Thorpe and Howard (2006) used similar data from MEPS, the National Health and Nutrition Examination Survey, and the National Medical Expenditure Survey and determined spending and disease prevalence for Medicare recipients (recipients
included some under 65) for data from 1987-2002. They concluded that “virtually all of the growth in spending from 1987 to 2002 can be traced to the twenty-percentage-point increase in the share of Medicare patients receiving medical treatment for five or more conditions during a year” (p. w385). As these financial statistics and disease prevalence indicate, medical and public health programs must address multiple chronicity of disease (Clark, 2011).

**Multiple Chronic Conditions**

In an analysis of data from the Health and Retirement Study of Older Adults in the US, researchers compared changes in prevalence of chronic disease and impairment from 1998 through 2008; in that 10 year period, overall percentages of older adults with a least one chronic disease increased from 86.9% to 92.2% (Hung, Ross, Boockvar, & Siu, 2011). These statistics differ from those reported by Lochner et al. (2013) as the Hung et al. research used a smaller categorization of chronic disease and self report. Hypertension, diabetes, cancer, chronic lung disease and arthritis all increased significantly while heart conditions and stroke did not significantly increase. The proportion of all older adults with multiple chronic diseases (3 or 4 conditions reported) increased from 19.1% to 22.7% for 3 conditions and 11.6% to 15.2% for 4 conditions; this increasing trend of multiple conditions extended across age groups. Ward and Schiller (2013) reported a significant increase in the number of multiple chronic conditions with increasing age; older adults, male and female, had a highest prevalence of multiple chronic conditions. The surveys and medical expenditure information articulate a clear need for coordinated planning to address the growing problem of chronic disease in an aging population.

Anderson and Horvath (2004) concluded their paper with recommendations to improve medical care coordination and secondary and tertiary prevention systems especially for those with multiple chronic conditions. This becomes critically important with the continued expected rise in chronic disease due to longevity and better medical care fighting the disease. The Health and Human Services Department has created a strategic framework regarding to improve health of persons with multiple chronic conditions (U.S. Department of Health and Human Services, 2010). This *Framework* identified the high financial and physical costs associated with multiple chronic conditions and the need for
coordinated care such as self-management to create health and quality of life for these individuals. In addition, care was identified too often treating isolated conditions rather than effectively addressing the person’s complexities. Since it is not specific to a single condition, CDSMP offers a broader way to promote self-management for those with multiple conditions. The next section highlights the typical conditions reported by age group.

**Typical Disease Clusters**

Ward and Schiller (2013) grouped most frequent dyads and triads of diseases in middle adults and older adults; while there were some differences in less prevalent dyads/triads between age groups, for both age groups and both sexes, the top dyads were arthritis/hypertension followed by diabetes/hypertension. The top triad for both age groups and sexes was arthritis/diabetes/hypertension. For the male 45-64 and 65+ groups, the second most prevalent triads were arthritis/CHD/hypertension and arthritis/cancer/hypertension respectively. For women 45-64 and 65+, the second most prevalent triads were arthritis/asthma/hypertension and arthritis/cancer/hypertension respectively. Ward and Schiller (2013) and Ward et al. (2014) noted that this type of information provides a better understanding of the high prevalence of multiple chronic conditions in the US population in multiple age groups. Such understanding should help target and adjust self-management interventions. Based on the statistics from this study, the types of disease that health educators and providers might address are similar between middle adult and older adult age groups even though the prevalence is higher in older adults.

**Chronic Disease and Falls**

Older adults face challenges to healthy aging not only due to the prevalence of chronic diseases but also the high impact of related problems such as falls and frailty. For example, one in three older adults will fall each year (Tromp, 2001), and older adults are the most likely to die from falls (Injury Prevention Program, 2010; Stevens & Olson, 2000). Injuries due to falls were the leading cause of hospitalizations for all age groups in Georgia (Injury Prevention Program, 2010). From a financial perspective, falls, much like chronic diseases, remain an expensive and often preventable problem. Stevens, Corso, Finkelstein, and Miller (2006b) reviewed cost of falls from 2000 and noted that $19
billion dollars was attributed to nonfatal falls. Sixty-three percent of that total cost was due to hospitalization, 21% due to emergency room visits, and 16% from outpatient care. Spending was highest (2-3 time higher) for women and with the highest incidence for both falls and injury due to falls for both sexes was in the 75-84 category. Locations and risk of falls vary but a recent study found that the oldest old (85+) were more likely to be injured in a fall and were more likely to fall in the home than younger age groups; in terms of location, the bathroom was identified as the most likely room associated with injury in the home (Stevens, Mahoney, & Ehrenreich, 2014). Due to the higher incidence as well as physical and financial costs of falls, fall prevention and management has been prioritized in programming for older adults (Ganz, Alkema, and Wu, 2008).

Often chronic disease is associated with falling. For example, when Barbour et al. (2014) analyzed 2012 BRFSS data regarding fall rates for overall population by age and state for those without arthritis was compared with fall rates for those with arthritis; he found “the age adjusted median prevalence of two or more falls and fall injuries among adults with arthritis was approximately 2.4 and 2.5 times higher, respectively, than those without arthritis” (p. 380). According to Lawlor et al. (2003), “chronic disease may increase the risk of falls through direct effects of the disease and indirect effects, such as reduced physical activity, muscle weakness, and poor balance” (p. 5). Healthy People 2020 objectives for the older adult highlight confidence to manage chronic disease and falls as priority areas of focus (Healthy People 2020, 2012). Chronic disease and falls are then intertwined issues; managing the symptoms of a disease such as uncontrolled blood pressure or blood sugars, may prevent conditions (such as weakness) or even sudden situations (such as orthostatic hypotension) that result in falls and possible injury due to falls. It is of note, that age is often not the main problem with falls; as in the research by Lawlor et al. (2003), the presence of the chronic condition(s) rather than the age was associated with increased fall prevalence. The interconnection between chronic conditions and falls will be further addressed by looking at the concept of fall risk.
**Fall Risk**

Those with multiple chronic conditions and increased frailty are at increased risk for falls and injury due to falls (Fried et al., 2001). In an analysis of community dwelling 65 and older Canadians, Sibley, Voth, Munce, Straus, and Jaglal (2014) found that fall risk increased linearly with the number of chronic conditions. They noted that fall guidelines do not typically address conditions, and “although falls are episodic in nature, fall prevention requires sustained effort – similar to chronic disease management strategies.” (p. 9). Ganz et al. (2008) identified falls as “acute events” often from chronic health issues that produce a chronic state of “fall risk” (p. 266). They acknowledged medical management, physical activity and exercise, and environmental management as the three main types of activities to address fall prevention and management. These authors advocated for a “no wrong door approach to fall prevention and management and “successful linkages” between consumer and providers of health-related content and interventions (p. 267). According to the authors,

Fall risk has important parallels with other chronic conditions, such as diabetes. In both cases, the risk of an acute event (a heart attack in the case of diabetes, or a fall in the case of fall risk) can be reduced by individuals and their providers taking action on the sources of risk, such as changing lifestyle or adopting risk-reducing interventions (e.g., medication for diabetes, or gait and balance training for fall risk). p.267

Taking action includes provision of programs such as CDSMP that address these areas of concerns and promote self-management in order to minimize chronicity and fall risk. Minimizing the impact of frailty by building physical and psychological reserves as well as promoting healthy aging throughout the lifespan are key aspects of minimizing the impact of fall risk and chronic disease (Bauer et al., 2014; Lahousse et al., 2014).

**Impact of frailty**

The impact of chronic conditions and/or falls can result in a decrease of physiological reserve that can then lead to frailty. Frailty, usually defined as some combination weakness, decreased walking speed, and decreased nutritional status, is associated with older age, gender (female), and histories of falls and
hospitalizations (Fried et al., 2001; Lahousse et al., 2014). Frailty, like falls, increases with multiple chronic conditions (Fried et al., 2001). Frail individuals when compared to non-frail older adults had a significantly higher risk for dying within three years even when data were adjusted for age, sex, and comorbidities (Lahousse et al., 2014). In their discussion, Lahousse et al (2014) argued those older adults in the intermediate stage of frailty (having only one or two frailty criteria) still have enough reserves to increase and build back strength and function; this stage “would therefore be suited for secondary prevention, including chronic disease management and geriatric assessment, fall prevention, exercise, and nutritional modifications” (Lahousse et al., 2014, p. 425). Lahousse et al. (2014) provides a clear glimpse of the possible connections between aging, chronic disease, and falls as well as the impact that interventions can have at this stage.

The research on frailty provides a glimpse of the possible role that CDSMP plays with the intermediate frail population. By engaging adults with chronic conditions early in their disease process, general self-management programs such as CDSMP minimize the effects of frailty just as they can address disease management. This is due in part since participation in a generalized chronic disease self-management program such as Stanford’s CDSMP builds efficacy and skills to facilitate engagement in activities such as exercise and healthy eating (Lorig & Holman, 2003). Increasing activity and exercise then builds physiologic reserves and limits the effects of chronic disease and the risk and effects of falls discussed by Lahousse et al. (2014). Fall prevention programs such as A Matter of Balance/Volunteer Lay Leader (AMOB/VLL) offer a more focused route to address some of the concerns related more specifically to falls or fear of falling but also promote exercise and building SE. For example, Cho, et al., (2015) reported increasing Fall-related SE was also associated with increases in exercise and participation in AMOB/VLL for people 85 and older. Organizations such as the Centers for Disease Control advocate for systems and programs such as CDSMP and AMOB/VLL which promote health management and build reserves through engaging in exercise and healthy habits (Bauer et al., 2014). Beattie (2015) recently urged that fall prevention be included in disease management. This dissertation offers initial exploration of possible changes to Fall-related SE after engaging in a disease management program.
It is important to understand not only a medical classification and impact of frailty but also how frail adults see themselves. In a qualitative study, researchers explored experiences of fifteen purposively selected older adults eighty-five or older who were living alone. Researchers created narrative analysis and recorded observations of oldest old adults who had been labelled frail by a healthcare team (Nicholson, Meyer, Flatley, & Holman, 2013). The older adults in the study did not use the narrative of frailty to define themselves, but researchers did identify central themes around loss and disconnections, sustaining connections and creating connections. Older adults used rituals to “successfully integrate previous, present, and future realities” and balanced loss with capabilities (p. 1178). This idea of balancing loss with capabilities ties into CDSMP emphasis on building self-efficacy (confidence) and skills as part of self-management (Holman & Lorig, 2004; Lorig & Holman, 2003). This is a key aspect when addressing self-management especially with a person experiencing frailty-showing these older adults what they can successfully manage in regards to their conditions and falls. Courses such as CDSMP provide successful management experiences that build older adult self-efficacy for the task at hand. The next section will address the broader idea of healthy aging and self-management concepts, use of CDSMP in self-management, and then will specifically address the use of self-efficacy as a theoretical orientation and outcome measure in self-management programs such as the general CDSMP or the more specific AMOB/VLL program.

**Healthy Aging**

Before addressing specific aspects of self-management, aspects of successful and healthy aging as it is associated with self-management should be more clearly defined to better support understanding of self-management and the role of SE in CDSMP. Rowe and Kahn (1998) defined successful aging as avoiding disease and disability while keeping mental and physical function. This high level of function allows the older adult to stay engaged in the business of living life. Many people have criticized this original conception of successful aging due to its emphasis on avoiding disease and dysfunction (Bowling, 2007). Few would meet their criteria since eighty-five percent of those sixty-five and older have at least one chronic disease (Anderson & Horvath, 2004). Inui (2003) called for a biopsychosocial
model of successful aging that incorporates both qualitative and quantitative understanding to better understand aspects of successful aging such as resilience. Thus, Rowe and Kahn’s model cannot fully explain successful aging. Bowling and Iliffe (2011) offered an alternative understanding; healthy aging is “not simply about physical or mental health maintenance, but rather about maximizing psychological resources, namely self-efficacy and resilience “(p. 9). To improve quality of life in aging, psychological approaches to aging such as SE along with coping, optimism, and self-worth must be addressed. This understanding of healthy aging emphasizes SE as an important component to quality of life.

The concept of healthy or optimal aging has also been used in public health to define aging well (Altpeter, Schneider, & Whitelaw, 2014; Anderson & Prohaska, 2014). Those using the term healthy aging typically define it as successful aging placed within an ecologic lens (Anderson & Prohaska, 2014). Healthy aging also incorporates client self-management into the successful aging framework. To achieve healthy aging, clients use self-management to decrease risk and minimize impact of chronic disease in order to maximize both physical and mental function while they keep engaged at a social and civic level (Altpeter et al., 2014; Anderson & Prohaska, 2014). In this conceptualization of aging well, the aging adult, the environment, support systems, and policies all hold key roles in healthy aging. Note for these authors, the psychological aspects are presented only in terms of function or social engagement which does not attend fully to the psychological aspects mentioned by Bowling and Iliffe (2011) in the preceding paragraphs.

**Behavioral Determinants for Healthy Aging**

Peel, McClure, and Bartlett (2005) identified behavioral determinants of healthy aging through a review of literature search for successful or healthy aging. In a list similar to modifiable risk factors for chronic disease, the authors identified smoking status, physical activity level, body mass index, diet, alcohol use, and health practices as modifiable risk factors associated with healthy aging. They recommend that policies and programs include lifestyle modification. Self-management programs such as CDSMP can promote such changes via knowledge and skills education, building efficacy through
mastery experiences, providing feedback, setting small, reachable goals and developing action plans (Bandura, 2005; Holman & Lorig, 2004; Lorig, Laurent, Plant, Krishnan, & Ritter, 2014).

Healthy Aging and Self-Management

Healthy aging reflects an active self-management component that seeks to harness the positivity effect associated with older adults; healthy aging, as defined for this dissertation, is an ongoing contextual process requiring goal directed actions and problem solving to promote physical, psychological, and emotional health and well-being. This definition springs initially from social cognitive theory, health self-management, and self-regulation theory especially associated with Stanford’s CDSMP (Bandura, 1998, 2004, 2005; Holman & Lorig, 2004; Kralik, Koch, Price, & Howard, 2004; Maes & Karoly, 2005).

Healthy aging should not be relegated to the few elite who dodge the impact of chronic disease as some have conceptualized successful aging based on the initial model presented by Rowe and Kahn (1998). Instead, healthy aging is an ongoing, interactive process that maximizes the strengths of older adults. Healthy aging recognizes the fullness of the aging experience and recognizes individuals participate in their own health and well-being every day through their actions and ways of viewing the world. For whatever reasons, older adults seem hard wired to find the positive in situations (Guse & Masesar, 1999; Reed & Carstensen, 2012; Sasse, Gamer, Büchel, & Brassen, 2014); this can and should be harnessed as part of the healthy aging process by building confidence in one’s capabilities to engage in the business of living. This can be applied to self-management practices in health. The next section will introduce a general disease management program, relate the program content to fall prevention and efficacy changes in falls, discuss its relation to SE as a core program foundation and mechanism for achieving health outcomes, and then consider theoretical orientations in self-management and self-regulation emphasizing social cognitive theory and self-efficacy.

Self-Management

For the last 20-25 years, many in the field of health promotion have encouraged a redirection in healthcare to self-management (Bandura, 2005; Brady et al., 2013; Healthy People 2020, 2012; Jordan, Briggs, Brand, & Osborne, 2008); Bandura (2005) called for a shift from a supply-based, disease model
to a demand-based health model where “self-management is good medicine” (p. 245). Others urge finding best models of self-management for chronic diseases to fight rising costs (Newman, Steed, & Mulligan, 2004) and to integrate care (Lawn & Schoo, 2010). Lorig and Holman (2003) identified three main tasks for self-management based on the qualitative work by Corbin and Strauss (as cited by Lorig & Holman, 2003): “medical or behavioral management, role management, and emotional management” (p.1). *Chronic disease self-management* has been defined as moving beyond mere symptom management to include lifestyle choices and behaviors to promote quality of life (Barlow et al., 2002). Lawn and Schoo (2010) created a slightly broader term, chronic condition self-management, to encompass living with disability and disease. For the purposes of this paper, the more commonly used chronic disease self-management will encompass both the disability and the disease effects.

According to Bandura (2005) as medicine shifts from a disease to health model, self-management has increased in importance; health habits can influence health and quality of life as people “exercise control over their motivation and health-related behavior” (p. 246). The term self-management refers to: the *processes* of self-management (using skills in self-regulation such as action planning and managing responses to manage both disease and risk factors); the *programs* of self-management such as CDSMP designed as interventions help people gain the skills to manage illness or general health; and the outcomes of self-managing such as better control of blood sugar (Ryan & Sawin, 2009). Health educators and health care professionals provide *self-management support* for those engaged in the process of self-management “acquire and maintain the knowledge, skills, and confidence to do what they need to do to live as well as possible with their chronic conditions(s)” (Brady, Anderson, & Kobau, 2015, p.53). All self-management endeavors should seek to engage the client in managing their own health (Bandura, 2005; Maes & Karoly, 2005). As was identified earlier, the press of the aging population, the prevalence of chronic disease in adults especially older adults, the increasing numbers of middle age and older adults facing multiple chronic diseases, the relationship between multiple chronic conditions and falls, and the cost of managing resulting impact from each of these have made self-management a critical component of health. This dissertation focuses on the Chronic Disease Self-Management Program (CDSMP) and its relationship to
types of self-efficacy associated with self-management (SE to manage chronic disease [SEMCD] and Fall-related self-efficacy [Fall-related SE]).

**Introduction to Chronic Disease Self-Management Program (CDSMP)**

As one of the best known and researched self-management programs, Stanford’s CDSMP is an evidenced-based lay-led program designed to provide adults with information and practical skills to manage chronic conditions (Bandura, 2004; Lorig, Sobel, et al., 2001; Ory, Ahn, Jiang, Lorig, et al., 2013). CDSMP originally developed from an arthritis self-management program into a generalized self-management program that can be used with multiple types of diseases, languages, cultures and in many settings (Lorig, Ritter, & Jacquez, 2005; Lorig, Ritter, Laurent, & Plant, 2006; Lorig, Ritter, & Plant, 2005). Although some studies outcomes are sometimes associated with a self-management program oriented to one particular disease or health problem such as arthritis, multiple sclerosis, HIV, or diabetes, CDSMP as a general program has consistently showed significant outcomes for a variety of conditions (Brady et al., 2011; Lorig, Ritter, & Plant, 2005). The current CDSMP uses a six week 2.5 hour per week scripted program format implemented by trained lay leaders. The original program was developed following a literature search of common topics taught in disease education programs as well as through the use of focus groups. The program closely follows Bandura’s self-efficacy and social cognitive theory in its choice of content and structure. As a better predictor of behavior than past actions (Bandura, 1997), SE forms an underlying structure for the CDSMP to promote general chronic disease self-management. The developers of CDSMP recognized this primary importance of SE and developed program components specifically to increase self-confidence to manage health and conditions (Ritter & Lorig, 2014). Participants engage in strategies designed to promote SE such as weekly action planning with feedback, modeling of behaviors and problem-solving, reinterpretation of symptoms through giving many causes and management techniques (using brainstorming sessions), group problem solving, and opportunities for making individual decisions (Lorig et al., 1999).

The initial RCT study used program outcomes under three main categories: *health behaviors* (exercise duration and cognitive symptom management), *health status* (disability, health, and well-being
scales, pain, fatigue, shortness of breath, and role and activity limitations), and health services utilization (emergency room visits, hospitalization past six months, nights in hospital) (Lorig et al., 1999). Today, the same general categories are often still used as CDSMP outcomes though communication with physician and/or healthcare provider has been often added as a health behavior (Barlow, Wright, Turner, & Bancroft, 2005; Chan et al., 2011; Elzen, Slaets, Snijders, & Steverink, 2007; Ory, Ahn, Jiang, Lorig, et al., 2013). Recent publications regarding CDSMP have organized outcomes around the three areas: better health, better care, and lower health cost (Ory, Ahn, Jiang, Lorig, et al., 2013; Kuliniski, K., Boutaugh, M., Smith, M., Ory, M., & Lorig, K., 2015). Better health outcomes include self-reported health, depression, and quality of life. Better care reflects outcomes such as provider communication and medication compliance (Kuliniski, K., Boutaugh, M., Smith, M., Ory, M., & Lorig, K., 2015). Recent studies have partnered with the Administration on Aging for funded work on grand scale disseminating CDSMP as an EBP (Kuliniski, et al., 2015; Ory, Smith, et al., 2013).

CDSMP and Use of SE

Strongly emphasized as a key program component CDSMP, SE perhaps can be understood as an underlying theoretical process or mechanism to influence outcomes as well as a direct study outcome (Lorig & Holman, 2003); it is incorporated throughout the program yet not always measured in research. Although used during initial CDSMP development for the Lorig et al. (1999) study, SE was not measured in the original study as a direct program outcome (Ritter & Lorig, 2014). SE to manage chronic disease was measured at the one and two year follow up to the original study using a scale developed during the follow up period, and researchers noted significant improvement in SE at two years as well as decreased service utilization at one year for those with higher SE (Lorig, Sobel, et al., 2001). While SE is a key aspect of the program, it sometimes is not measured as a variable. For example, the National Study of CDSMP did not address SE as one of its research aims or utilize the 6-item scale as an outcome measure (Ory, Ahn, Jiang, Lorig, et al., 2013). Despite frequent exclusion as part of CDSMP study variables, SE remains an important mechanism in changing behaviors in programs such as CDSMP.
In those studies that have measured some form of SE pre and post CDSMP, SE as an outcome has improved significantly in many age groups, cultures, contexts and has been sustained over time (Barlow et al., 2005; Chan & Chan, 2011; Drenkard et al., 2012; Farrell, Wicks, & Martin, 2004; Franks, Chapman, Duberstein, & Jerant, 2009; Gitlin et al., 2008; Goldberg et al., 2013; Jerant, Moore-Hill, & Franks, 2009; Lorig et al., 2006; Lorig, Ritter, & Jacquez., 2005; Lorig et al., 2013; Lorig, Ritter, et al., 2001; Melchior et al., 2013; Siu, Chan, Poon, Chui, & Chan, 2007; Tomioka, Braun, Compton, & Tanoue, 2012). In contrast, researchers from other studies reported no significant changes over time or for different populations (Dongbo, 2006; Elzen et al., 2007; Farrell et al., 2004; Haas et al., 2005; Harrison et al., 2012; Kendall et al., 2007; Reeves et al., 2008; Ritter, Lee, & Lorig, 2011; Rose et al., 2008). A meta-analysis of twenty-three CDSMP studies and a separate analysis of twenty-four studies using Stanford’s Arthritis Self-Management Program concluded that there was a moderate effect size for SE; this held whether SE was broken down into pain management or symptom management or measured as general SE (Brady et al., 2011). In addition, effect sizes persisted through a nine-twelve month period (Brady et al., 2011) for both programs. From this meta-analysis, SE should be seen as one of the important outcomes following participation in CDSMP or self-management programs even though its variability as an outcome should also be acknowledged. Lorig and Laurent (2007) called SE a “weak outcome” although acknowledging that it can predict changes in health behavior and health status in CDSMP; those doing better in classes are associated with having a higher SE at the start or an increase in SE during. They recommended the current medley of outcomes (health behaviors and status, healthcare utilization, and SE) to best capture the program effects for heterogeneous program participants such as typically engage in CDSMP. In spite of this variability, Brady et al. (2011) concluded across a variety of studies and over time, SE can be seen as an effective mechanism to produce changes such as from increases in SE for managing chronic disease (SEMCD).

A few studies have looked at moderators of SE in CDSMP and have found that low initial SE or related constructs are associated with greater gains in SE by participants (Franks et al., 2009; Jerant, Moore, Lorig, & Franks, 2008; Reeves et al., 2008). Harrison et al. (2012) addressed depression and
multi-morbidity as potential moderating effects in a secondary analysis of the British version of CDSMP called Expert Patient Program. The researchers found multi-morbidity did not show moderating effects on a nineteen item SE scale (similar to original series of SE scales used in 1999 study). Despite the lack of moderating effect of multi-morbidity on SE, Harrison et al. (2012) acknowledged the role SE may have in the greater changes in outcomes of this lower functional level group. Ritter and Lorig, (2011) completed a secondary analysis of English and Spanish CDSMP data for possible moderators of CDSMP. Though the results were inconsistent across all of the outcomes, the authors did note that high level of a primary symptom (meaning worse symptom) was associated with higher post SE across both studies. SE, when analyzed as a moderator, results did not support earlier findings by (Reeves et al., 2008) for SE as predictor of later SE levels; the researchers concluded that there was “little justification for targeting individuals with particular levels of initial self-efficacy” (p. 171). It is clear from the conflicting research that SE is complex to measure, and as Harrison et al. (2012) noted, more research needs to be done in this complicated area to clarify how SE works to influence self-management.

Stanford’s CDSMP has a strong, ongoing research base with both internal (many randomized controlled trials) and external validity (longitudinal studies and program translations across the world) (Brady et al., 2011). The generic self-management content and the program’s close alignment with SE and social cognitive theory offer an excellent base for this dissertation’s research question whether engagement in a chronic disease self-management program impacts related types of SE—in this case Fall-related SE. Now that CDSMP and its use of SE have been introduced, the theory underpinning self-management and self-regulation will now be addressed.

**Theory in Self-Management and Self-Regulation**

**Self-Regulation**

Health habits change not by will but through the use of “motivational and self-regulatory skills” (Bandura, 1998, p. 246). *Self-regulation* offers methods to change and maintain behavior change through mechanisms such as self-monitoring of behavior, incentives and social supports, and goals and action plans (Maes & Karoly, 2005). According to (Bandura, 1997) self-regulation should be thought of as an
ongoing process not a personality trait; this process supports and is supported by SE. Bandura described self-management in terms of regulation of human motivation, action, and well-being with perceived SE as the “key factor in the casual structure because it operates on motivation and action both directly and through its impact on other determinants” (Bandura, 1998, p. 623). This next section will focus on social cognitive theory applications to self-management and more specifically on the importance of SE in self-management of health and conditions.

**Social Cognitive Theory**

Social cognitive theory (SCT) provides a framework to analyze human motivation, thought, and action (Bandura, 1986); it uses an “interactional model of causation in which environmental events, personal factors, and behavior all operate as interacting determinants of each other” (p. xi). Bandura identified a bi-directional system called *Reciprocal Determinism* where personal factors/cognition, the behavior and the environment interact with each other; in other words, people do more than just react to something in the environment, they evaluate and choose behavior based on beliefs about possible outcomes of actions. In these interactions, a person’s ability to think symbolically help transform experiences to guides for future actions and problem solving. The capability of forethought allows people to anticipate consequences of action, set goals for future and develop action plans to reach; “by representing foreseeable outcomes symbolically, people can convert future consequences into current motivators and regulators of foresightful behavior” (p.19). In vicarious learning, people learn the rules of behavior from others in addition to own learning.

**Self-regulation.** Self-regulation facilitates individual learning by setting standards and evaluating later. Self-reflective capabilities allow a person to analyze his or her own experience and to change thinking (Bandura, 1986). Bandura (1986) identified the most important aspect of reflective thinking to be the self-appraisal of efficacy; SE appraisals can influence how a person chooses an action, the action chosen and even how long a person will continue trying in adversity. People’s abilities to plan, think ahead, motivate, self-regulate and self-examine are part of “human agency” which “regulates their motivation and activities” through interactions (Bandura, 2001). *Self-efficacy* (SE) or “peoples beliefs in
their capability to exercise some measure of control over their own functioning and over environmental events” (Bandura, 2001, p. 10) is considered the central mechanism of agency. Since people tend not to act if they do not believe they can, perceived SE takes a “pivotal role in the causal structure of social cognitive theory because efficacy beliefs affect adaptation and change not only in their own right, but through their impact on other determinants” (p. 10). It is for these reasons that this dissertation explores SE in greater depth from both theoretical and practical applications in CDSMP and fall prevention and general self-management. First, additional clarifications about social cognitive theory will build a conceptual foundation for further discussion of SE.

**Role of observation and outcomes.** Most behavior is learned by observation (Bandura, 1986). To serve as a guide for action in the future, feedback and repetition form observations into symbolic representations. When combined with incentives (direct, vicarious, or self-produced), observational learning can produce action. Once a person acts, this interaction is evaluated where views of successful interaction promote continuing the behavior and lack of success promote no or different behavior. People learn from outcomes, and these outcomes motivate other action. Related experiences create causal beliefs based on environment, social and personal interactions. As a person develops these causal beliefs, the beliefs also direct a person’s attention.

**Fear versus threat.** When a person misses opportunities to attend to other cues to produce different action in the environment, fears and phobias can result. Bandura explained that fear arousal can be thought of as a protective action; when too frightful, people overgeneralize to protect self. If a situation or something is viewed as a threat, a person can better cope. Fear results from ineffective control over outcomes rather than resulting from a drive state of panic according to Bandura (1986). To change this type of fear behavior, successful mastery experiences and modeling of success must show person that exercising control over threat is possible; the fears become predictable and controllable. This revision of cues must build efficacy in coping. Fear will decrease once a person views self as able to cope. This type of fear can easily be applied to the fear of falling that AMOB/VLL addresses (Ory et al., 2010).
Competencies. Bandura (1997) described competence as arising from a combination of skills and SE. He noted that studies with those who were depressed to be more realistic in self-appraisal than non-depressed participants and yet had worse outcomes. According to Bandura, having causal agency even when positively unrealistic can produce successful action. This is similar to the positive self-appraisal of those in long term care facilities discussed earlier (Guse & Masesar, 1999); realistic appraisal may not be as important as belief or confidence in ability to do something. Self-management programs such as CDSMP focus on future goals and action and use SE to drive agency to make behavior changes. The next section addresses outcomes and motivation as described by social cognitive theory.

Outcome expectancies. Rewards and consequences help regulate actions; those actions associated with rewards tend to be repeated (Bandura, 1986). According to Bandura, expected outcomes can strongly influence behaviors more so than the reality of the behavior can. Outcome expectancies motivate behavior but self-evaluative aspects of behavior must also be considered in social cognitive theory. Bandura noted based “self-perceived inefficacy can nullify the most enticing outcome expectations” (1986, p. 231); therefore competencies and action result from more than just effort or expected outcomes due to the mediating effects of SE. To best motivate behavior, outcome expectancies of external incentives are combined with internal standards and incentives. A person acts, develops skills from actions and evaluates skill level. Early skill acquisition needs more positive external incentives to build while more developed skills build using internal feedback about progress. Intrinsic motivation can arise as a result of the action but meeting a goal in the action can become its own reward as well. Bandura stated that “cultivating competencies enables people to exercise personal control over outcomes” (1986, p.245). Increasing perceived competency (or SE) builds interest and incentivizes the task through mastery and personal agency. This represents a key understanding in self-management of health; changes that persist first require initial success with external motivators and feedback to help “verify” SE.

Later experiences can use “self-directed mastery to strengthen and generalize self-percepts of efficacy” (1986, p. 259). Therefore, in the case of coping, positive early experiences build SE to cope with later threats. Self-management programs such as CDSMP build competencies from general skills to
manage chronic disease, and success with skills builds SE to manage disease process so that when more difficult threats arise, a person can cope based on perceptions of efficacy from prior experiences and feedback. When a person adopts internal standards, self-monitors effect of actions and uses self-incentives, her or he is using self-regulatory capabilities and exercising personal control. While short term goals can use external incentives, sustained changes and self-management of chronic disease utilize Bandura’s ongoing process of self-regulation.

**Self-regulatory mechanisms.** People decide to act based in part to self-observations, evaluative judgments and self-reactive influences (Bandura, 1986). Self-observation involves a realistic appraisal and attention to behavior patterns and use of self-motivating goals. The strength and type of goal as well as the tendency to pursue a goal even when it is difficult depends on perception of capability or SE. Supportive aspects for behavior include clear, timely (short) feedback, use of valued or meaningful behaviors, and emphasis on rewards to build efficacy. Greater or more difficult changes require optimized combinations of goals, incentives, building SE to succeed. The judgmental aspect of self-regulation develops as a result of internal standards comparison and exposure to social norm comparison. Self-reactive influences include self incentives such as to reach a desired goal or problem with current status. As people meet goals and gain skills, competencies increase and develop self-motivation to challenge self. Problems arise when self-evaluation function has too high (causes stress) or too low expectations (does not motivate action) and when the external environment does not support self-regulation by failing to provide vicarious learning and modeling experiences or through provision of too much negative feedback (Bandura, 1986). Self-management programs such as CDSMP developed content to support self-regulation by promoting reachable goals and action plans to achieve and teaching content to provide skills to build competency. Through modeling and feedback, participants build SE to manage their disease process which then helps motivate their exercise of control to change health habits and improve health.

To summarize, some of the core determinants of SCT in health promotion include knowledge, SE, outcome expectations, goals and facilitators/barriers in regard to the health behavior (Bandura, 2004).
Knowledge involves understanding the risks and the benefits of a health behavior such as self-managing conditions. In his article on health promotion and SCT, Bandura called SE the belief in ability to “exercise control over one’s health habits” (144). As discussed earlier, outcome expectancies relate to the “costs and benefits” of health habits. These outcome expectancies, especially when used for self-evaluation, play a role in motivating changes to meet health goals and improve habits. Aspects of self and environment act can as facilitators or barriers to the behavior (Bandura, 2004). More specific focus of SE will be discussed in the following paragraphs.

Self-Efficacy

Review of Self-Efficacy Basics

Bandura (2007) defined self-efficacy as “the belief in what one can do with whatever resources one can muster” (p. 646). In his book, Self-Efficacy: The Exercise of Control, Bandura broadly defines SE as “beliefs in one’s capabilities to organize and execute the course of action required to produce given attainments” (1997, p. 3). SE describes what a person thinks he can do rather than what he will do. Bandura stressed the importance of SE in his comments on its pervasive influence; “people’s beliefs in their efficacy affect almost everything they do: how they think, motivate themselves, feel, and behave” (Bandura, 1997, p. 19). In SCT, SE plays a key pivotal role in personal agency as it influences actions directly as well as through other determinants (Bandura, 1997). Bandura (2004) called SE a “focal determinant” (p. 145) because of its direct and indirect influences on behavior choices and motivation.

Relation to models of health behavior. As a predictor, moderator, and mediator in health behavior, SE is routinely included in self-management education (Lorig, Ritter, et al., 2001) and health promotion models (Bandura, 1997, 2004; Maes & Karoly, 2005). The strength of self-efficacy to influence health behaviors was a primary justification for its use as a focus for this dissertation. Bandura (1997) noted that many of the models of health behavior use or have adopted perceived SE as a key construct. He cited theory of planned behavior as an example; by adding perceived behavioral control to the theory of reasoned action, the theory improved predictive ability; SE acts as a determinant of intention. Bandura (1997) explained since SE beliefs “affect thinking, motivation, and affective states, all
of which act upon behavior, it is not surprising that intention is not the sole proximal determinant of behavior” (p. 284). SE then, can influence outcome expectations and therefore influence motivation; according to Bandera, “people’s beliefs in their efficacy affect almost everything they do; how they think, motivate themselves, feel, and behave” (1997, p. 19). Efficacy can be a better predictor of behavior than the actual past performance of action (Bandura, 1997). The use of SE in many different models of health behavior, whether added to model or original to model, marks SE as an important construct in theories the engagement in healthful behaviors or avoidance of health-risk behaviors, which often includes concepts about the self-management of health (Bandura, 2004). Several key aspects of SE will now be presented in support of health self-management.

**Sources of Self-Efficacy.** Since SE can impact health habits directly and impact other determinants of action such as outcome expectancies, researchers and those in health promotion should attend to methods to influence SE (Bandura, 1997). As mentioned earlier, skills and the SE in ability to use skills forms competence (Bandura, 1986), but SE is not a judgment about acquiring skills but rather “judgment of what one can do with whatever skills one possesses” (p. 391). Bandura (1986, 1997) identified four sources of SE: mastery experiences, vicarious experiences, verbal persuasion/social influences, and physiologic/affective states.

**Mastery experiences.** According to Bandura, mastery experiences are the most influential source for SE beliefs. People must have successful experiences to build mastery. Mastery in turn can build SE through successful experiences. A resilient sense of efficacy “requires experience in overcoming obstacles through perseverant effort” (p. 80). While opportunities for mastery and success must be present to build SE, setting the level of mastery challenge too low can undermine efficacy beliefs due to unrealistic expectations. “Guided enactive mastery” (p. 80) provides the just-right-challenge to build belief in capability that will persevere in challenges. This form of mastery creates “stronger and more generalized efficacy beliefs” (p. 80) than other sources of influence such as vicarious experiences (Bandura, 1997; Bandura & Adams, 1977). CDSMP leaders facilitate goal setting by participants that can be successfully reached within a short time period to better ensure mastery experiences as a method to
build efficacy and skills to manage disease processes. Prior knowledge and meaning can change how information from experience is selected and interpreted. Much like the positivity effect of aging, Bandura noted people tend to highlight the positive aspects and downplay inconsistencies of their experiences. “Efficacy beliefs are thus both products and constructions of experiences” (1997, p. 82). From a knowledge viewpoint, improving SE works best using clear positive feedback following action to counter a person’s beliefs that they are unable to do something. For example in CDSMP, participants are encouraged to focus on what they can control rather than aspects of disease that they cannot. By developing successful action plans, participants’ SE is strengthened which in turn strengthens healthy habits and behaviors.

**Vicarious experiences.** Vicarious experiences such as social comparisons to others or modeling by others can also help to build SE. In a discussion on aging, Bandura emphasized this process in choices for self-comparison. If as one ages, one makes comparisons to those one’s own age, one is likely to believe her or she is doing the task well. However, self-comparison is made with someone forty years younger, one might believe he or she cannot do the same task. Modeling and vicarious experiences are both part of the CDSMP program.

**Verbal persuasion/social influences, and physiologic/affective states.** Verbal persuasion can also build SE especially when applied as feedback from a credible source to support hard work or progress toward goals. Finally, Bandura described how physiologic and affective states can influence SE judgments. Mood can bias what is attended to and how that information is interpreted. Physiological and psychological factors associated with stressful arousal can be interpreted as “vulnerability to dysfunction” (Bandura, 1997). Interpretation depends on context meaning attached to the situation by the person. Improving strength and endurance, decreasing pain and stress, and redirecting interpretation of physical and emotional states can promote increased SE. According to Bandura, belief in one’s efficacy helps regulate functioning through cognitive, motivational, affective, and selective processes. Cognition informs states and can help predict action and exercise control in life. Perceptions of control boosts SE and can help create resiliency in difficult times (Bandura, 1997). Modelled performances that are
predictable and controlled increase SE. Increase SE can then help improve coping behavior (Bandura, 1986). Efficacy can change thinking patterns; generally a person with high efficacy is more future and goal oriented than someone with low SE.

**Motivation.** In terms of motivational processes, thinking about actions creates motivation and helps form beliefs about what can do. In SCT, “people function as active agents in their own motivation rather than being simply reactive to discordant events” (Bandura, 1997, p. 133). To trigger self-motivation, goals should be specific in order to guide action and create a reachable challenge not too far away. Proximity of goals in time help create motivation. SE beliefs can influence the goal setting level, how committed the person is to reaching the goal, influences strategy choices to reach goal as well as amount of effort used.

**SE, emotion and health communication.** In addition, “SE beliefs affect the nature and intensity of emotional experiences through the exercise of personal control over thought, action and affect” (Bandura, 1997, p. 137). Bandura defined a threat as a “relational matter concerning the match between perceived coping capabilities and potentially hurtful aspects of the environment” (1997, p. 140). “Too much fear without a sense of personal control makes self-protection seem like an exercise in futility. Thus a threat that is viewed as personally uncontrollable is best tuned out” (1997, p. 280). For Bandura (1997), knowledge is important but “a shift in emphasis is required, from trying to scare people into health to provide them with the tools needed to exercise personal control over their health habits” (p. 280). People need to know how to change behavior and they need a strong belief that they can affect/change the behavior (SE) to take action. He suggested tailoring messages to the person’s specific level of SE. Tailored messages via multiple response mechanisms using computers and the internet have been a relatively recent method to target groups but tailor at the individual level (Bandura, 2004; Noar, 2007). Those with low SE typically need a program that provides graded mastery experiences to build efficacy. In contrast, those with higher SE should not need as extensive self-management program (Bandura, 1997, 2004, 2005). Bandura cautioned that the ability to tailor a message at the individual level cannot alone predict behavior change; he suggested tailoring must be paired with key determinants
identified through social cognitive research and theory (2004). Health communications need should facilitate a person’s understanding of possible change and then provide how to change.

**Measuring SE**

SE should be considered task specific and responsive to context and experience; this is in contrast to more trait, fixed types of applications for self-concept (Bandura, 1997). Although SE can influence intention, Bandura differentiated SE as a judgment of capability rather than intention; in other words, SE scales should measure what a person thinks they *can* do rather than what they think they *will* do. For example, if measuring efficacy to manage chronic disease, before and after a heart attack, the efficacy might change as a result of the heart attack. Bandura further explained that “efficacy beliefs should be measured in terms of particularized judgments of capability that may vary across realms of activity, under different levels of task demands within a given activity domain and under different situational circumstances” (p. 42). Thus, following Bandura’s SE theory, efficacy to manage disease and efficacy to manage falls should be measured using separate scales based on different activities. For an activity, SE is usually measured using Likert-type scales that are specific to that task but that also use a variety of judgments of capability for differing task levels. Efficacy beliefs can vary in terms of level, generality, and strength according to Bandura (1997). *Level* of task means varying levels of task difficulty; the scale should have some easier and more challenging aspects of the task to prevent ceiling effects. *Generality* applies to differences in across a set of activities that might be determined by a combination of beliefs, type, contexts. The last dimension, *strength*, shows how easily a belief can be disconfirmed (weak belief) versus more sustained. A strong efficacy belief in capabilities to do a task is associated with persistence even when task or aspect of task is difficult.

**SE scales.** Bandura recommended that scales to measure SE have at least 10 steps to get differences noted and to avoid negative as judging self incapable is the lowest level (Bandura, 1997). Generally scales are constructed using concept analysis and expert knowledge that also allow for a range of responses. “0” on scales “cannot do”, “5” on scales “moderately certain can do”, “10” on scales
“certain can do” (pp. 43-44). He also recommended using averaged scores to get perceived efficacy for an activity.

SE is generally measured as specific to task since broader measures of SE use too many aspects; better information comes from scales that reflect the activity or task in question and the context (Bandura, 1997). Bandura acknowledged that there are several types of “different types of capabilities, such as management of thought, affect, action, and motivation” (p. 45) and that different types of activities or contexts might use different efficacy types. He cautioned that making a scale too specific with high correlations “sacrifices validity for internal consistency” (p. 45) and ends up with a redundant scale. Scales should be specific to a task yet contain a range of variation to task and difficulty. He recommended factor analysis and using construct validation. For construct validity he cited that the measure can predict as expected by SCT theory. Both of the scales selected for the dissertation research have been developed in manners that support Bandura’s recommendations. These scales will be addressed more specifically in the methods section of Chapter 3.

Generalization or Transfer of SE

Although specific efficacy measures are ideal to detect changes, Bandura (1997) emphasized that “adaptive functioning requires discriminative generalization of perceived efficacy” and that there was some “transfer of efficacy beliefs between experiences” (p. 51). Much like other aspects of learning, experience and reflection connect efficacy beliefs. This has application in this dissertation study; what if SEMCD might transfer to Fall-related SE? Or more likely, what if the general self-management content and subskills permit generalization of content to facilitate co-development of Fall-related SE? Bandura specified five generalizing processes through mastery experiences in the following skill areas: different activities/similar sub skills, co-development (same developmental period different skills), skills linked by role or importance, self-regulation skills, and coping skills (1997, p. 51). He defined generalizable self-regulation skills as “generic skills for diagnosing task demands, constructing and evaluating alternative courses of action, setting proximal goals to guide one’s efforts, and creating self-incentives to sustain engagement in taxing activities and to manage stress and debilitating intrusive thoughts” (p. 51). He
indicated that performance can improve from learning similar skills as can people’s beliefs of ability to complete the self-regulation skills. This dissertation explores whether engagement in the generalized chronic disease self-management program will create such self-regulation skills that will transfer to fall-related efficacy beliefs as well. This transfer of efficacy beliefs might also occur through similar sub skills generalizations toward co-development; older adults might see the importance of efficacy to manage disease processes and falls as efficacy that develops as part of healthy aging processes. Any effects seen in related types of SE might be due to the generalization of shared program content (exercise, fall prevention, medication management, etc.) that CDSMP and fall prevention programs typically share.

**Health Promotion Theory and SE**

**Bandura, health promotion, and SE.** Bandura put forth a “threefold stepwise implementation model” for health promotion in relation to SE as a mechanism for improving outcomes; he underscored that need to fit the program to the person’s “self-management capabilities and motivational preparedness” (p. 146). In this model, those with high SE and positive outcome expectations need minimal guidance. At the lowest level, those with low SE and low expectations need more step by step mastery in-person experiences. CDSMP and fall prevention programs such as A Matter of Balance/Volunteer Lay Leader provide this form of support. The middle level of expectations/efficacy might need some intermediate type program such as phone-based support (Bandura, 2004). Those with the highest levels of SE may not need a formalized program for managing CD or falls due to high SE helping to motivate and create outcome expectations for success. The need to build SE to maximize outcome has been discussed above and therefore those with lower beginning levels of SE may need more formalized programs. Perhaps those with higher SE might more easily generalize SE from one task (such as managing disease) to SE to another task (such as managing falls).

**An integrated model for older adults.** Ireland and Arthur (2006) discussed the use of Baltes and Baltes (1990, 1993) selection with optimization and compensation or SOC aging theory and Bandura’s SE theory together in an integrated model for older adults in stroke prevention. From the SOC model, older adults make choices that optimize what they can do and compensate/do something different
for those things they can’t do. They indicate such a pairing “provides an important age-sensitive
dimension to health assessment and care planning” (pp. 306-307). According to the authors, health issues
such as a minor stroke can impact perceptions of SE to engage in risk reduction for stroke. Aspects of the
social cognitive theory help explain methods to develop competencies in such things as managing stroke
risk or other chronic diseases; according to Bandura, SCT constructs of SE and outcome expectancies
should be considered in the context of mastery experiences and the use of modeling/vicarious experiences
(Bandura, 1998). “Framing the task for older adults so that the challenge is adequate to provide reward
and improve SE without overwhelming their ability and creating feelings of failure may allow for the
development of a resilient sense of efficacy” (Ireland & Arthur, p. 304). Promotion of a resilient SE
should be a key part of working with the older adults so to instill a sense of confidence in managing
health that adds to the reserves needed for aging well and managing health/life issues in aging. CDSMP’s
focus on SE to manage disease can maximize this confidence.

**Role of environmental press.** In their seminal article on the ecology of aging, Lawton and
Neahemow (1973) note that there is a difference between “maximum performance” and “maximum
comfort” (p.29) in terms of press from the environment. They called the positive effects of environmental
press being in the zone of adaptation and competence, and they “note that as the individual’s competence
increases, the variability in environmental press which he can comfortably tolerate increases” (p. 28).
The authors termed this as the “environmental docility hypothesis” to describe when the environmental
impact becomes too great, maladaptation results as a person cannot remain within their zone of
competence and adaptation. Ireland and Arthur discussed that the types of states associated with
experiences high stress or fear can have a negative reaction to self-efficacy even creating “aversion to the
associate behavior” (p. 304). Lawton and Neahemow(1973) described similar responses to press; “when
the environmental press are (is) very strong the individual may panic and attempt to escape from the field
either physically or psychologically” (p. 29). Based on Bandura’s social cognitive theory, this type of
feedback can result in decreased SE which in turn can influence behavior and outcome expectations. As
healthcare providers, it becomes critical to establish just right challenges and press to keep the person in
Lawton’s optimal adaptation zone; use of overt fear and risk based health communications must be carefully monitored so that the fear or press does not become too great. Ireland and Arthur highlight that matching interests should be used to promote SE and desired behaviors; they note “to encourage older adults to adopt SE behavior, healthcare providers should select risk-reduction challenges that match their interests and capabilities. Interim, achievable goals may allow for increased efficacy, belief, create intrinsic interest, and encourage an incrementally increasing standard of performance” (p. 305). It follows then, that selection of task and content may impact promotion of SE and behavioral outcomes.

**Aging, self-management, and SE.** Returning to the SOC model of aging, Ireland and Arthur indicated that incorporating the aging-related SOC concepts are consistent with and complementary to enhancement of SE. Altered selections of activities as part of the SOC process permit the older adult to address and enhance SE. In their discussion, the authors indicated that “age and self-efficacy-sensitive dialogue has additional potential to form the basis of a prevention plan of care that has meaning to older adults in reflecting their strengths, interests, life experience, and goals” (2006, p. 306). While their focus was on stroke risk prevention, the use of the SOC theory of aging in complement with social cognitive theory and specific methods to build and address SE could easily be extended to managing chronic disease and falls in the older adult as well.

In summary of SCT and SE, Bandura (1997) noted that self-regulation must be more than an “act of will”; to build self-regulation skills a person must attend to the behavior or needed skill, set short, reachable goals with incentives and use social supports. The goals serve to both motivate action and direct action. According to Bandura, “Once empowered with skills and belief in their capabilities, people are better able to adopt behaviors that promote health and to eliminate those that impair it” (p. 286). Health promotion programs (such as CDSMP or AMOB/VLL) that emphasize building SE make it “more likely that people (will) enlist the personal resources and sustain the level of effort needed to adopt and maintain health-promoting behaviors” (Bandura, 1997, p.286).
CDSMP in relation to SCT and SE.

From the perspective of SCT and SE, self-management of chronic disease is “another example of the use of self-regulatory and self-efficacy theory to develop cost-effective models with high social utility” (Bandura, 2004, p. 159). The earliest versions of CDSMP began as “atheoretical” but added perceived SE into its developing theory after finding weak associations between changes in health status and health behaviors; these authors chose SE to help explain the impact of feeling in control of health has on health status and behaviors (Lorig & Holman, 2003). As mentioned earlier, for CDSMP, SE provides a theoretical foundation as well as potential measure (Lorig & Holman, 2003; Lorig et al., 2013; Lorig, Sobel, et al., 2001; Ritter & Lorig, 2014). Bandura (2004) cited CDSMP as providing an example of goal setting, problem solving, and skill instruction through the mastery, modeling, and feedback training needed to improve SE. He also indicated that programs like CDSMP use an “approach (that) provides a generic model that can be adapted with supplementary components to different chronic diseases” (p. 159).

While Bandura stressed CDSMP’s generic approach applying to different diseases, he makes no mention of related types of SE that might also be addressed due to the generic nature of the program content. CDSMP establishes an environment that facilitates problem solving, group modelling, and persuasion effects while using mastery experience to set positive outcome expectancies for engaging in self-management and improving in SE. Researchers have also explored the effect of generalized content versus more specific disease content. For example, a more specific disease approach such as for arthritis has been shown to have enhanced outcomes compared to the generalized CDSMP content when researchers compared arthritis participants in the original Arthritis Self-Management program with those who were assigned to the more general CDSMP. Though improvements were noted in both programs, the arthritis participants had greater outcomes in the more specific program (Lorig, Ritter, & Plant., 2005). Despite the greater benefits of the specific program, it is of note that CDSMP offered positive benefits for the participants with its general content.

In terms of reaching many people, using a more generalized program creates cost effective programming because it applies to a broader base of people (Ahn et al., 2013). According to Ahn’s
calculations, even reaching 5% with chronic conditions might save 3 billion dollars. CDSMP has been shown to create positive outcomes in a variety of diseases such as diabetes, arthritis, hypertension, MS, COPD, and Lupus (Barlow, Turner, Edwards, & Gilchrist, 2009; Cameron-Tucker, Wood-Baker, Owen, Joseph, & Walters, 2014; Drenkard et al., 2012; Lorig & Laurent, 2007). As a generalized program, CDSMP can impact health outcomes associated with self-management regardless of disease; however, some disease types or intensity may need an additional module or focus to adequately address issues as was suggested by Lorig, Ritter, and Plant (2005) in the comparison research with and arthritis program. Perhaps this same logic might be applied to CDSMP and falls; those in more immediate need of fall intervention might go first to a program such as AMOB/VLL. Others with little or no worries about falls could go into the more general CDSMP workshop. This would address the no wrong door approach to falls suggested by Ganz et al (2008) as well as Beattie’s (2015) suggestion to broaden disease self-management to include falls.

One key final point: mastery experiences create “personal enablement” and provide a main method to create resilient SE. “Personal enablement is achieved by equipping people with knowledge, sub skills, and self-affirming experiences in the exercise of personal control” (Bandura, 1997, p. 60). This highlights the previous paragraph’s discussion on program content and skills. Thus, problem solving and action planning represent generic skills that can be applied to both types of efficacy and contexts. In addition, since the effects of chronic disease are often associated with increased falls (due to changes such as loss of vision, sensation, or weakness), perhaps dealing with the consequences would be linked via the different activities/similar subskills. For example, weakness resulting in decreased activity worsens a heart condition and increases fall risk; skills to set up health routines to address this issue might result in changes to both Fall-related SE and SEMCD.

**Age-Based Considerations for Self-Management**

**General issues with self-management of chronic disease**

Many of the issues facing the middle age and older adults mirror the health needs for the general population. For example, everyone, regardless of age requires healthy diet, adequate exercise, and sleep
(“Healthy People 2020: Leading Health Indicators,” 2014) for optimal health. Despite the common ground of basic needs and even similar multiple chronic disease clusters, these age groups also each represent unique challenges based a variety of personal, interpersonal, and societal differences. The associated increases in chronic disease with age, changes and variations in roles and general life-course differences will each be addressed in terms of application to disease management practices. This dissertation Phase 1 used participants of any age but Phase 2 interviews used those participants 65 and older in order to seek individuals more likely to have issues with falling.

**Age differences in CDSMP outcome effect size**

CDSMP’s broad applicability to different peoples, multiple ages, and varied conditions is one of the unique benefits of its use (Ory, Smith, et al., 2013). The recent two year *National Study of CDSMP* had over 100,000 middle age and older adult participants of many backgrounds (17% Hispanic, 21.5% African American). Settings varied too, although the most common were community aging service locations, healthcare settings, and residential settings. Ory, Smith, et al. (2014) analyzed data from the *National Study of CDSMP* study in terms of age using 50-64 and 65+ as age groups and found several differences between the two age groups. The authors noted that the three main study outcomes (social role function, communication with physicians, and depression) improved significantly from baseline to 12-month assessment for both cohorts. Despite these similar overall outcomes, there were some differences between the groups. CDSMP participants across the nation were asked to participate in six and twelve month follow-ups after program participation (Ory, Smith, et al., 2014). For those in the middle age group, all secondary outcomes improved significantly (self-assessed health status, overall quality of life, fatigue, pain, shortness of breath, and sleep difficulties, number unhealthy-mental and physical- days, and days with limited activity). For those in the older age group, all secondary outcomes except quality of life and number of mental unhealthy days were significant. Both age groups benefitted from this generalized, widely available program even though outcomes did vary by age.

While health must be managed across the continuum of care from home to the community to the physician to the hospital, it also must be managed throughout the lifespan or life course; programs and
research must make these types of connections to move beyond single program or diagnosis models into a more complex, systems approach that reflects the complexity of the aging adult and multiple chronic conditions (Ory et al., 2012). The research translating evidenced based programs such as CDSMP moves into this complexity. In a somewhat surprising finding, Ory, Smith, et al. (2014) concluded that the overall magnitude of effect size from the National Study of CDSMP outcomes was greater in the middle age group than for the 65+ age group. The authors note this is especially significant because this particular national study was focused for the older adult population rather than those in the middle age group as part of a national effort to increase evidenced based programming for older adults (Ory, Smith, et al., 2014; Ory, Smith, et al., 2013). There were about half as many middle age adults in this study as older adults; however, the success of the outcomes and numbers of middle age adults enrolled in the programs do indicate that the CDSMP has appeal and applicability to the middle age group as well as the older adult group (Ory, Smith, et al., 2014).

Ory, Smith, et al., (2014) noted that this middle age cohort also had more participants who rated themselves as sicker across all time periods (more unhealthy physical and mental days and more days of limited activity) and was more ethnically and racially diverse. In their discussion, the authors stated the better outcomes (greater effect size) in the middle age group could be due to regression of the mean; however, this finding does support prior research in CDSMP; in other studies, participants with lower initial baseline have progressed the most (Harrison et al., 2012). Although SE was not measured in the Ory, Smith, et al. (2014) study, several studies have noted this same younger/sicker/more benefit result for SE (Harrison et al., 2012; Reeves et al., 2008). While there are differences by age, a generalized self-management program like CDSMP can serve both younger and older populations producing beneficial outcomes in both. These beneficial outcomes arise from the general skills and problem solving taught in CDSMP and mastery experiences to build SE. Perhaps, then, the similarity in content, skills and use of SE in traditionally separate programming such as fall prevention might produce changes to Fall-related SE as well.
Special considerations implementing CDSMP with older adults

As previously mentioned, many types of clients of all ages engaged in CDSMP can improve their ability to manage their disease processes (raise SE, increase exercise levels and numbers of healthy days, decreased visits to the ER) (Lorig, Sobel, et al., 2001; Ory, Ahn, Jiang, Lorig, et al., 2013). CDSMP has produced results for different disease, ages and in different formats (Ory, Smith, et al., 2013). It has become a nationally known evidenced based program for chronic disease self-management that has been successfully translated to different communities and environments (Brady et al., 2013; Ory, Ahn, Jiang, Smith, et al., 2013). As noted earlier, for specialized needs (due to personal learning needs, additional information or skills, restricted access due to health) or low beliefs in SE, more focused programming and individualized case coordination may be needed.

CDSMP facilitates self-management skills in older adults

Skills such as using medications properly and strategies such as changing behaviors and adjusting and coping with change aid in adults’ own management of conditions (Holman & Lorig, 2004). CDSMP was designed to help develop and strengthen self-management skills and improve SE to engage in these skills (Holman & Lorig, 2004; Lorig & Holman, 2003; Lorig, Sobel, et al., 2001). Strategies such as problem solving, decision making, resource utilization, formation of a patient-provider partnership, action planning, and self-tailoring support outcomes such as engaging in physical activity and improving the number of healthy days (Lorig & Holman, 2003). Use of peer supports and weekly reachable goal setting help provide SE and the skills to create action plans that could include, for example, doing just 10 minutes of exercise.

Older adult views on self-management

Ideally, self-management programs should reinforce all aspects of aging successfully as perceived by older adults. Kralik et al. (2004) completed qualitative interviews, using of autobiographies with nine older adults and found that in contrast to the public health focus of education, older adults viewed self-management as a “process to bring about order in their lives” through recognizing and keeping boundaries, mobilizing resources, managing shifts in identity, and “balancing, pacing, planning and
prioritizing” (p.259). According to the author, self-management training should focus on these four themes. The authors defined self-management as a process “creating a sense of order” (p. 259) or “the activities people undertake to create order, discipline and control in their lives” (p. 260). They specifically critiqued programs such as Stanford’s Arthritis Self-Management Program as research from the perspective of the researcher and making assumptions that people self-manage the same way.

Findings from the research (Kralik et al. 2004) showed self-management as a way to counter the disorder from illness. For participants, mobilizing the resources was associated with “identifying, understanding and making the most of what was available to help one to live well” (p. 262). The shifts in self came from attempts to negotiate and deal with changes from past and present selves.

While the authors did not mention SE, they did address some issues around control and confidence:

Arthritis created disorder in the control of the body and threatened the sense of self. Self-management to Jackie meant having the confidence to take ‘control…I have to manage myself’.

Control referred to the exercise of power over management of both her environment and arthritis.

(Kralik, et al., 2004, p. 264)

Their last theme echoes themes of recent work with older adults by this author where balancing, pacing, planning prioritizing were all aspects of self-management (Graham, 2014). Kralik, et al. (2004) noted that “the meaning of self-management for participants did not involve education by health professional or necessarily the adherence to medically prescribed treatment regimens” (p. 265). The authors discussed that health educators have used programs like arthritis or CDSMP to create “structure” but stated that participants were often passive recipients of information. The findings from these participants indicated that “self-management of chronic illness was more than ‘doing’ but was entwined with a sense of ‘being’ and ‘becoming’. Self-management fluctuated as life and the illness itself presented new challenges. It was a process that involved identifying one’s psychological and physical responses to illness and constantly planning, pacing and managing daily life as a means of creating order” (p.265). These are important considerations for the role of self-management programs within the processes of fluctuating
illness and changing contexts and resources. As an active process, self-management can take many forms. For example, managing disease and managing falls are both aspects of self-management which use SE to build behaviors to manage health.

In another qualitative study, Thorne, Paterson, and Russell (2003) interviewed adults who were referred by practitioners as people managing their diseases. Disease groups studied included diabetes type 2, HIV, and multiple sclerosis. The authors cited the complexity and unique aspects of individuals managing diseases and the impact of context as important aspects for facilitating self-care decisions in managing diseases. The authors highlighted the importance of self-evaluation in decisions for self-care which mirror some of the SCT discussion on self-regulation. Participants made decisions in self-care by considering meaning, expectations of health professions, intuition, and “learned rules of thumb about the efficacy of self-care decisions” (p. 1348); in addition, these “experts” managed their disease processes by reading body cues properly, adjusting actions, and developing rules about when to seek help. Although study findings were not articulated in terms of SCT, these aspects of self-management strongly support mechanisms identified by Bandura (Bandura, 1986, 1997, 2005).

A Matter of Balance/Volunteer Lay Leader (AMOB/VLL)-Content and Processes in Relation to SE

As mentioned earlier, both CDSMP and AMOB/VLL have foundations in SE theory.

AMOB/VLL currently defines Fall-related SE as confidence in ability to prevent or manage falls (Smith, Jiang, et al., 2012; Smith, Ahn, et al., 2014). While CDSMP follows a social cognitive approach in its use of SE theory, AMOB/VLL follows an approach designed in the initial randomized controlled study using cognitive restructuring and control beliefs where participants identify maladaptive fears and attitudes about fears and are presented with models and cognitive training how to shift thinking to “adapting “ or motivating thoughts (Tennstedt et al., 1998) influencing perceived behavior control regarding managing and preventing falls (partly comprised of SE). Teaching materials and multiple forms of exposure to the material help reinforce adaptive thinking as do teaching skills to prevent falls, what to do if have a fall, exercise and strength training. Once the thinking has shifted, participants follow with setting goal about some prior restricted activity or other adaptive, positive change (Tennstedt et al.,
“Goal setting and problem-solving skills learned during AMOB/VLL enrollment helped participants maintain their sense of efficacy for preventing falls” (Smith et al., 2012, p. 7). A similar emphasis on goal setting and problem solving can also be found as a priority in the CDSMP (Lorig & Holman, 2003; Lorig et al., 2014). Both CDSMP and typical fall prevention programs such as AMOB/VLL use education and skills training to promote SE and maximize outcomes.

**Older adults’ perceptions of fall prevention programs (FPP)**

Despite the increased risk of falling and injury with increasing age and despite the fact that some aspects surrounding falls can be prevented, many seniors are unlikely to make use of fall prevention programs; for example, out of sixty people interviewed following visit to ER from a fall, only 52% considered a fall prevention strategy following visit to ER. Seventy-two percent were “reluctant” to engage in exercise class at a local facility, and yet 93% were willing to start taking meds for preventing fractures/osteoporosis (Whitehead, Wundke, & Crotty, 2006). AMOB/VLL was created to work with persons with a fear of falling; given the percentages cited in Whitehead et al. (2006), many older adults may not consider a fall prevention program (FPP) as something that applies to them.

**Difference in perceptions between providers and participants**

In addition to not perceiving FPP as applicable, participants’ perceptions as compared to health providers differed greatly; many of the qualitative studies show that older adults perceive fall prevention programs to be for someone else, have a low personal perception of risk, or fear of loss of autonomy/being vulnerable (McMahon, Talley, & Wyman, 2011; Yardley, Bishop, et al., 2006; Yardley, Donovan-Hall, Francis, & Todd, 2006b). Many researchers made a distinction between participants with higher levels of fear of falling who tend to restrict activity versus those with lower levels of fear and suggest that programs be tailored to better address the different needs of these groups (Ganz et al., 2008; Li, Fisher, Harmer, McAuley, & Wilson, 2003). Fall prevention is a complex, multifactorial issue that must be considered from many perspectives using the “no wrong door approach” (Ganz et al., 2008, p. 266) to fall prevention activities mentioned earlier. Perhaps those with lower fear of falling but who have difficulty with chronic disease management would first engage in general health self-management to
build general skills before they might perceive the need for engagement in a fall prevention program such as after a fall. Such early engagement might provide changes in efficacy to manage falls that could positively impact the older adult later by storing up physiologic reserves discussed by Lahousse, et al. (2014).

**Perceptions regarding falls**

Many older adults either do not perceive that there is anything that can be done about falls and/or often reject fall programming due to the threat it poses to their sense of identity and autonomy rather than lack of perceived risk (Yardley, Bishop, et al., 2006; Yardley, Donovan-Hall, et al., 2006). For those individuals, participation in a general self-management program may be more appealing than a risk-based fall program from a health communication standpoint. Based on threat/fear appraisal information (Witte, 1994; Witte & Allen, 2000), strong fear appeals (risk-based programs) can lead to maladaptive thinking and avoidance. Recalling back to the theory associated with AMOB/VLL, this is the very thinking health educators and clinicians are trying to change and impact. Much of the fall literature on patient perception of programs points to framing fall prevention in terms of general wellness (Clark et al., 2013; McInnes, Seers, & Tutton, 2011; Yardley, Bishop, et al., 2006; Yardley, Donovan-Hall, et al., 2006; Yardley et al., 2008). Access to a generalized program like CDSMP might be less challenging to aspects of risk and autonomy; CDSMP could provide such general training without triggering the fear response discussed in the SCT section earlier. In addition, the emphasis on skill building and problem solving in CDSMP may create an earlier access point before the effects of disease and frailty are fully evident. Doing so would build skills for a lifetime instead of addressing issues that already exist. Such skills quite possibly may increase of SE to manage disease process and indirectly building Fall-related SE as well.

**Possible CDMSP applications to falls**

As a general program, the CDSMP has been successfully applied to different diseases, languages, and cultures; however, no research has explored applications of CDSMP content and programming to related program content such as fall prevention despite the program containing a brief section on fall prevention. Perhaps for some individuals, the general program content provided by CDSMP (restorative
and preventative benefits of exercise, the importance of proper diet and proper medication use, comfort and health literacy skills for communication with health providers, and environmental safety) might be similar enough to content typically covered in fall prevention programming to enhance SE to manage/prevent falls. The generalized skills content of the CDSMP could prime SE in relation to confidence to prevent falls for those who are not yet at high risk for falls but face increasing risk due to the aging process. Later applications of specific, fall prevention content could be implemented more easily due to initial changes in SE and the person having confidence that he or she can prevent falls. Bandura suggests that the generic base program (such as CDSMP) could be further enhanced with specific mastery components designed to improve SE (Bandura, 1997).

The question remains whether the broad, generalized content found in CDSMP can impact different types of efficacy, especially SE typically associated with another program. While there has been discussion and suggestions at looking at services in terms of collaborations and integrated service provision (Altpeter et al., 2014; Beattie, 2015; Lawn & Schoo, 2010), little if any research has been done in this area. There have been some interesting glimpses into possibilities. For example, based on the data that arthritis as a condition increased the likelihood of falling, Barbour et al. (2014) recommended that arthritis based exercise programs be combined with fall prevention interventions:

Public health approaches to preventing poor outcomes among adults with arthritis have focused on evidence-based self-management education and physical activity interventions that have been proven to reduce pain and improve function by correcting muscle weakness and balance dysfunction. Combining arthritis exercise programs with proven fall prevention intervention might reduce the risk for falls in this at-risk population. (p. 380)

The author’s note that currently used arthritis programs might “reduce the risk for falls and fall injuries but have not yet been evaluated for these outcomes” (p.382). The CDSMP program was developed out an arthritis self-management program that incorporates exercise and other multifactorial components. The Arthritis program mentioned follows a similar program to CDSMP, and thus, CDSMP might have similar effects. Beattie (2015) stated, “There is an urgency to broaden the discussion on chronic disease
management and how to best apply disease management guidelines to fall prevention” (p. 62). Looking at fall outcomes baseline and post participation in a self-management program is an important research step. Fall prevalence is only part of the picture. The belief that people have that they can manage their health and falls through actions such as exercise is a critical part of healthy behaviors and self-management.

Whether similar skills and implementation strategies in disease self-management can build efficacy in the possibly related task of managing falls has not been explored. No published research regarding whether participation in CDSMP might influence Fall-related SE was identified during this review of the literature. Chronic disease programming shares similar content with fall prevention programming such as the importance of exercise, building strength, taking medications, communicating with healthcare provider, and environmental modifications in the home. It also includes a 10-minute Fall prevention and improving balance section in session 2 of the standardized workshop. This shared content might then be assumed to give exposure to similar skills, build behaviors and build SE to manage not only their disease processes but also impact fall prevention. Perhaps the individuals likely to attend a CDSMP type program due to doctor referral or meeting direct need would not be as likely to attend a fall prevention program. While in the chronic disease program, they would be exposed to content which could build skills and knowledge that would promote efficacy to prevent and manage falls. This might be considered a possible generalization of efficacy experiences through mastery of related content. It could also be explained that the content between the two programs was similar enough to produces changes in a related type of task specific efficacy (in this case Fall-related SE).

An Introduction to the Problem

From a practical consideration, a review of the recent community-based health promotion literature provides justification of considering possible impact of a generalized disease program on Fall-related SE. The 2014 National Council on Aging promotional material for fall prevention specified typical issues that can lead to falls including balance and gait, vision, medications, environment, and chronic conditions. The organization’s flier, “Take control of your health: 6 steps to prevent a fall,” includes recommendations to: exercise, talk with healthcare provider, regularly review medications,
anually screen vision and hearing, keep home safe, and talk to family members about falls (http://www.ncoa.org/improve-health/center-for-healthy-aging/falls-prevention/falls-prevention-awareness-1.html). Those fall-based prevention recommendations are similar to the listing of benefits after participation in the Georgia Living Well CDSMP program (http://www.livewellagewell.info/lwcdsmp.html): medication management, proper sleep hygiene, nutrition, physical activity, working with your healthcare team, communication, action planning/goal setting, falls prevention. Although the link between fall prevention and the CDSMP can be seen from the commonalities these community-based communications, the possible links between fall prevention and CDSMP have not been researched or explored. Both types of community programs have explored program outcomes using SE measures (Healy et al., 2008; Lorig et al., 2013; Lorig, Sobel, et al., 2001; Smith et al., 2012). In addition, SE has been shown to be both moderator and mediator of effects in both types of programs (Bandura, 1997; Li, Fisher, Harmer, & McAuley, 2005). As a result, this paper proposes the use of SE as a route to enhance understanding how older adults perceive the impact of CDSMP on their Fall-related SE.

**Use of SE and CDSMP**

Social cognitive theory with a specific focus on SE theory shaped the conceptual lens for this research proposal. Interactions with self, others and the environment build a sense of belief in personal ability to do a task such as manage conditions or manage falls. This belief in capability is defined as *self-efficacy*. According to Bandura (2005), CDSMP provides methods to support development of skills to enhance self-management as well as build and support SE, cognitive problem solving, and action planning by facilitating an environment for mastery and successful interactions.

**Pragmatism and mixed methods research**

Greene (2007) encouraged researchers to understand their personal mental model and how it influences all aspects of research interactions; this research moves beyond the narrow conceptions of SE typically imposed through the use of scale data in quantitative research. Research should not have to be an either qualitative or quantitative approach; it can be a “both, and” approach. In taking a “both, and”
position, views of constructed knowledge (epistemology) and reality (ontology) were placed in the working space with more positivistic SE scale measures. Adopting a pragmatic stance facilitates this process, since pragmatism prioritizes context and process over beliefs about reality; it provides a understanding that reality exists and yet “encountered only through human experience” (Morgan, 2014, p. 39).

This pragmatism permitted the research to stay closely aligned to a reality-as-constructed orientation for the Phase 2 interviews while still embracing methodology in the use of the SE scales that enabled “shared knowledge” (Morgan, 2007, p. 40) between realist and constructivist ways of knowing. According to Morgan (2007, 2014), the pragmatic researcher seeks to understand the impact of methodological decisions have on best answering the research question; inquiry then, becomes about the best match of methods to answer the questions. This can be approached by determining reasons for method choices, how to combine methods, and how to integrate methods to best take action to reach the research goals. The choice of mixed methodology best answered the research questions while still maintaining a strong value for participant meanings and experience.

Morgan (2014) identified four main components of pragmatism:

People take actions according to their likely consequences, and they use the results of those actions to think about what will likely happen if they take similar actions in the future; actions cannot be separated from the situations and contexts in which they occur; actions are linked to consequences in ways that are open to change; actions depend on worldviews that are socially shared sets of beliefs. (pp. 26-27)

Pragmatism’s focus on interactions and knowledge as constructed based on experience allowed me to bring both ways of seeing self-management together; its practical focus helped to prioritize the research questions (Johnson & Gray, 2010) rather than requiring a choice of an exclusive paradigm such as constructivism (Morgan, 2014).

In the pragmatic paradigm, the positivistic SCT/scale driven constructs of SE were integrated together with the constructed meanings and experiences of older adults in order to develop understanding
of SE and self-management. The use of mixed methods methodology allowed and embraced the complexities of this research question by creating a “theoretical bridge that connects the research problem with the research method” (Hesse-Biber, 2010, p. 11). Use of mixed methods also provided enhanced understanding of the complex issues of SE and self-management (Greene, Benjamin, & Goodyear, 2001). Pragmatic mixed methods supported developing new understandings and theory about SE and the impact of related program content on types of SE (Greene, 2007; Greene, Caracelli, & Graham, 1989).

Health-related fields are using mixed methods as a way to access the complexity of health interactions; Ivankova and Kawamura (2010) searched the literature for MMR and found that about half were from medicine and health. They clarify:

Although contextual reasons vary across disciplines, the complexity of research objectives, the inductive logic of qualitative inquiry, and the utility of mixed methods designs that allowed for meaningful combinations of quantitative and qualitative methods in a single study seem to be the major factors that caused social, behavioral, and health sciences to embrace mixed methods research. (p. 585)

Mixed methods research offers combinations of quantitative and qualitative methodologies such as found in some of the mixed method studies with CDSMP (Barlow et al., 2005; Johnston, Irving, Mill, Rowan, & Liddy, 2012). These methodological combinations and interactions allowed the rich, older adult experiences and understandings of changes to SE following program participation to be fully explored.

**Research Questions**

This sequential, mixed methods study addressed perceptions of SE following participation in a disease self-management program. The research questions for this dissertation were:

- How are the concepts of self-efficacy to manage chronic conditions (SEMCD) and self-efficacy to manage/prevent falls (Fall-related SE) related before and after participation in a self-management program? (primarily quantitative)
• How does participation in a self-management program impact older adult perceptions of self-efficacy to manage or prevent falls (Fall-related SE) as compared to their perceptions self-efficacy to manage chronic conditions? (mixed)

• How do older adult participants understand relationships between self-efficacy to manage chronic conditions (SEMCD) and self-efficacy to manage/prevent falls (Fall-related SE) following participation in a self-management program?
CHAPTER 3

EXPLORING FALL SELF-EFFICACY OUTCOMES FOLLOWING PARTICIPATION IN A CHRONIC DISEASE SELF-MANAGEMENT PROGRAM\(^1\)

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Abstract

Chronic conditions and falls are related issues faced by many aging adults. These issues are typically addressed using separate evidenced-based programs (EBP) for disease management and fall prevention. These interventions attract and serve a shared population, and many programs often include types of self-efficacy (SE) as foundational course constructs to bring about behavior change and promote relevant outcome measures. Stanford University’s long-standing Chronic Disease Self-Management Program (CDSMP) recently added brief fall-related content to its standardized 6-week content; however, no research has examined changes in Fall-related SE in response to CDSMP participation.

Method

This study explored relationships and changes in SE for two SE scales in participants who successfully completed CDSMP workshops (attending 4+ of 6 sessions) within a Southern state over a 10 month period. The Self-Efficacy to Manage Chronic Disease scale (SEMCD Scale) is commonly used as a measure in CDSMP. The Fall-related SE scale (FallE Scale) is commonly used in the EBP A Matter of Balance/Volunteer Lay Leader Model (AMOB/VLL). SE scale data were compared at baseline and post-intervention for 36 adults (mean age 74.5, SD ± 9.64). Principal component analysis (PCA), using oblimin rotation with delta set at 0.0 and suppressing coefficients below .4, was completed at baseline and post-intervention for the individual scales and then for analysis combining both scales as a single scale. Other analysis of the SEMCD Scale and the FallE Scale scores at both time periods included reliability, correlations, and parametric and nonparametric assessment of score differences and rankings post-intervention.

Results

Each scale loaded under a single component for the PCA when entered individually at both baseline and post-intervention. When both scales were entered as single meta-scale, two factors were noted with no double loading. SEMCD Scale loaded on one factor and FallE Scale loaded separately on another factor. SEMCD and FallE Scale scores were significantly correlated at baseline and post-intervention, at least p<.05. A significant proportion of participants improved their scores on the FallE
Scale post-intervention (p=.038). The magnitude of the change was also significant only for the FallE Scale (p=.043). The SEMCD Scale scores did not change significantly.

Discussion

Study findings from the exploratory PCA and significant correlations indicated that the SEMCD Scale and the FallE Scale measure two distinct but somehow related types of SE. Though the scale scores were correlated at baseline and post-intervention, only the FallE Scale scores significantly differed post-intervention. Given this relationship and CDSMP’s recent addition of a 10-minute fall prevention segment (Lorig et al., 2012), further exploration of CDSMP’s impact on Fall-related SE would provide useful understanding for health promotion in aging adults.

Key words

Self-efficacy; chronic disease; self-management; fall prevention; Chronic Disease Self-Management Program

Introduction

Although chronic disease has become an issue for over half of adults in the U.S., older adults have an even higher rate for single and multiple chronic conditions (Ward, Schiller, & Goodman, 2014). Older adults also face increasing risk of injury due to falls as they age (Stevens, Corso, Finkelstein, & Miller, 2006). Risk of falls can be further impacted by the direct effects of disease as well as indirect effects such as weakness, limited engagement and balance issues (Lawlor, Patel, & Ebrahim, 2003). Given the impact of chronic disease and falls in older adults, evidenced-based programs (EBP) such as those that focus on disease self-management and fall management and prevention are key components of health promotion geared toward the older adult population (Ory & Smith, 2015). Stanford’s Chronic Disease Self-Management Program (CDSMP) is an evidenced-based program that uses self-efficacy (SE) and mastery experiences to develop skills and SE to manage chronic conditions.

CDSMP promotes better health and better care in workshop content that focuses on exercise, diet, environmental safety, provider communication, and action planning/goal setting (Lorig & Holman, 2003; Kuliniski, K., Bouthaug, M., Smith, M., Ory, M., & Lorig, K., 2015). Maine’s A Matter of
Balance/Volunteer Lay Leader Model (AMOB/VLL) is a complimentary EBP to CDSMP that addresses confidence and skills to manage and prevent falls (Smith, Jiang, & Ory, 2012). CDSMP and AMOB/VLL share some general content including the use of action plans, the importance of exercise, medication issues and effective communication (Davis, Marra, & Liu-Ambrose, 2011; Lorig & Holman, 2003; Lorig, Ritter, et al., 2001; Smith, Ahn, Sharkey, et al., 2012). The most recent version of CDSMP also added content to specifically address falls with a 10-minute activity entitled “Preventing Falls and Improving Balance” (Lorig, Gonzalez, & Laurent, 2012). In this session, leaders review and brainstorm risks for falls and follow up with a review of ways to reduce fall risk (Lorig et al., 2012). Older adults may face intersecting issues of multiple conditions and fall risk. These concerns can be at least partially addressed in an integrated manner through the addition of fall-related content within a general-self-management program.

Both age and having a chronic condition may be additional areas of intersection between CDSMP and managing falls. For example, both CDSMP and AMOB/VLL commonly target older adult populations. Although both programs are offered by agencies serving older adults, CDSMP workshops typically have younger participants than AMOB/VLL. In the National Study of CDSMP, (Ory, Ahn, Jiang, Lorig, et al., 2013) reported a mean age of 65.4 (SD ± 14.3) while a large AMOB/VLL study (Ory et al., 2010) reported a much older mean age of 77 (SD not reported). Participants typically have at least one chronic condition in both type of programs. AMOB/VLL participants age 65-84 reported 1.75 (SD ±1.20) chronic conditions and 1.64 (SD ± 1.14) chronic conditions for ages 85+ (Cho et al., 2015). Participants in the recent National Study of CDSMP had a mean 3.0 (SD ± 1.7) conditions for all ages and 2.9 (SD ± 1.6) conditions for participants 65 and older (Ory et al., 2014). CDSMP potentially shares at least some overlap in terms of age and press of chronic conditions with those engaged in fall prevention programs (FPP) such as AMOB/VLL.

SE, the perceived confidence in one’s ability to complete a task and exercise control (Bandura, 1997), is often a key component of health promotion theories and programs (Bandura, 2004). Both CDSMP and AMOB/VLL utilize SE as a foundational program component to facilitate a sense of control,
self-management and specific program outcomes (Ritter & Lorig, 2014; Smith, Jiang, & Ory, 2012). Since self-efficacy is understood as task-specific (Bandura, 1997), short self-efficacy scales have been developed for each program that focused on the type and range of tasks associated with the interventions’ specific content and outcomes. More specifically, CDSMP focuses on a person’s self-efficacy to manage chronic conditions (SEMCD). The six-item Self-Efficacy To Manage Chronic Disease Scale (SEMCD Scale) is currently recommended for use by CDSMP researchers who noted that the SEMCD Scale was correlated for both baseline and post-intervention health indicators such as health distress, illness intrusiveness, activity limitation, depression, and fatigue. A five-item fall management self-efficacy scale (FallE Scale) has typically been used in AMOB/VLL research to measure Fall-related SE (Smith, Jiang, et al. 2012; Tennstedt et al., 1998).

There are differences between CDSMP and traditional FPP such as AMOB/VLL. Content in CDSMP promote managing conditions while FPP emphasizes managing falls. In addition, initial rationale for taking the class might be very different between those taking CDSMP to gain skills to manage conditions versus those taking FPP to learn how to decrease fall risk. Despite the differences, the intersection of aging, disease, and falls should be addressed in a broad approach; Beattie (2015) urged fall management be incorporated into disease management. Ganz, Alkema, and Wu (2008) identified “fall risk” as often resulting from chronic issues. These authors advocated for complimentary services such as coordinated medical management of conditions, exercise programs and home assessments. They did not, however, mention CDSMP or other generalized self-management programs as an effective route to their “no wrong door” approach to fall prevention (p. 270). From a FPP perspective, Smith, Jiang, et al, (2012) suggested that AMOB/VLL be a “gateway” to encourage older adults to engage in complimentary courses and practice their skills. The addition of the fall-related content and potential intersections in terms of older adults (who are seeking to manage conditions but also may be dealing with increased risk or concerns about falling possibly due to those conditions) make CDSMP a possible route to address fall management. Figure 3.1 shows potential relationships between the person (disease, general health status,
age, life experiences and environmental context), their baseline and post-intervention efficacies to manage conditions and falls (SEMCD and Fall-related SE), and participation in CDSMP.

This study offered an initial exploration at baseline and post-participation in CDSMP between two types of efficacies, SEMCD and Fall-related SE. The purposes of this study were to: (1) explore relationships between types of SE using self-efficacy scale scores for managing disease (SEMCD) and managing/preventing falls (Fall-related SE); and (2) assess changes in FallE Scale and SEMCD Scale scores after CDSMP participation.

Methods

Chronic Disease Self-Management Program (CDSMP) and Recruitment

This study was part of a larger mixed method study exploring the relationships between SE to manage chronic conditions (SEMCD) and SE to manage and prevent falls (Fall-related SE) among older adults who successfully completed (attending 4+ of 6 sessions) CDSMP workshops. The standardized CDSMP promotes self-management skills such as problem solving, decision making, using resources, interacting with providers, as well as setting goals to facilitate self-management of conditions (Lorig & Holman, 2003). During the six, 2.5-hour workshop sessions lay leaders use action planning, feedback, and social modelling to promote participant mastery and increase SEMCD (Lorig & Holman, 2003). Content includes a brief section on fall prevention and balance as well as safe medication use, improving provider communications, the importance of activity/exercise, managing pain/fatigue, dealing with emotions/depression, positive thinking, diet, relaxation, and sleep.

Participants were recruited from CDSMP workshops being held within two main regional Area Agencies on Aging during a 10-month period. After the first two months, recruitment expanded to the entire state to maximize participant recruitment opportunities. Of the 19 classes scheduled in the two main regions, eight workshops were conducted and 11 workshops were cancelled due to lack of registration or participation. The additional regional recruitment resulted in one of two possible workshops yielding additional participants for research purposes.
Eligibility criteria was based in part on criteria used by the *National Study of CDSMP* (Ory, Ahn, et al., 2013), which required participants to have attended the first or second workshop session, been diagnosed with a chronic disease, and consented to participating in study’s baseline and post-intervention data collection. To ensure receipt of intervention, only those who successfully completed the program (attending at least 4 of 6 sessions) were included in the final analysis. Of the total 86 workshop participants, 53 consented to the study. Of those 53 who consented to the study, 43 completed the required 4+ sessions, and 36 of those 43 fully completed both the SEMCD Scale and the FallE Scale and were therefore used in analysis. See Figure 3.2 for specific breakdown of participant recruitment efforts. Across the rest of the state, one additional region’s class was recruited for the study. Another region agreed to assist with study but was not included as the course was cancelled. For three workshops (in other regions) either course site or leaders deferred study participation.

**Measures**

**Demographics.** To minimize participant burden, demographic information was retrieved from self-reported intake forms used for CDSMP workshops within the state. Permission to access this information was first obtained from the State Division of Aging Services and then only with participant consent. Self-reported demographic information retrieved from this form included age, sex, race (American Indian, Asian/Asian-American, Black/African American, Hawaiian Native/Pacific Islander, White/Caucasian), ethnicity (Hispanic, nonHispanic), chronic conditions (Alzheimer’s/Dementia, Osteoarthritis/Rheumatoid Arthritis, Breathing/Lung disease, Cancer, Chronic Pain, Depression/Anxiety, Diabetes, Heart Disease, High Cholesterol, Hypertension, Multiple Sclerosis, Osteoporosis, Stroke, Other, None), and education level (Some elementary-high school, High school graduate or GED, Some college or technical school, Bachelor’s degree or higher).

Consenting participants completed the initial baseline measures using the SEMCD Scale and the FallE Scale during sessions one or two of CDSMP workshop. Post-intervention measures were collected from same participants at the final session. In cases where the final session was missed, data were
collected via phone follow-up. The researcher or lay leader provided limited assistance to those needing assistance to read and/or complete consent and scale forms.

**SEMCD.** Participants completed initial baseline and post-intervention 6-item modified version of the Self-Efficacy to Manage Chronic Disease Scale (SEMCD Scale) using a Likert scale with response choices ranging from 0 to 10 (0=not at all confident to 10=completely confident). Participants were asked: *How confident are you that you can: 1) Keep the fatigue caused by your disease from interfering with the things you want to do? 2) Keep the physical discomfort or pain of your disease from interfering with the things you want to do? 3) Keep the emotional distress caused by your disease from interfering with the things you want to do? 4) Keep any other symptoms or health problems you have from interfering with the things you want to do? 5) Do the different tasks and activities needed to manage your health condition so as to reduce your need to see a doctor? 6) Do things other than just taking medication to reduce how much your illness affects your everyday life?* Scores were reported as average scores. This 6-item format was developed and recommended by Stanford CDSMP researchers to measure SE for managing chronic conditions (Lorig & Laurent, 2007). Researchers have reported baseline SEMCD mean scores ranging from 4.9-6.1 and six month post-intervention mean difference in scores ranging from 0.36 to 0.84 (Ritter & Lorig, 2014). Ritter and Lorig (2014) noted the scale loaded on a single factor using principal component analysis, had high internal consistency reliability coefficients (Cronbach alpha ranged from .88 to .95), and recommended the SEMCD as a reliable scale for the measurement of self-efficacy to manage conditions.

**FallE Scale.** The 5-item Fall Efficacy Scale (FallE Scale) was used to measure baseline and post-intervention Fall-related SE in this study. This scale was developed by Tennstedt et al. (1998) as a fall management scale for the original AMOB study. Since that time, the scale has been used to measure perceived ability (self-efficacy) to manage and/or prevent falls (Fall-related SE) in people attending AMOB/VLL. For this current study, participants rated items using a 1-4 Likert scale (1=not at all sure to 4=very sure), regarding their confidence to: 1) find a way to get up if fall; 2) find a way to reduce falls; 3) protect self if fall; 4) increase physical strength; and 5) become more steady on feet. Scores were
summed as a total score using the recent scoring method used in the translational AMOB/VLL study (Cho et al., 2015). Reliability coefficients reported for this scale ranged from .76 when initially developed (Tennstedt et al., 1998) to .87 in recent AMOB/VLL translational studies (Cho et al., 2015; Smith, Jiang, et al., 2012).

**Analysis**

To promote consistency of comparisons between participants, only participants with fully completed baseline and post-intervention scales were included in analysis for a final n=36 out of the 53 consenting participants. SPSS was used for all statistical analyses. Demographics were reported as frequencies and percentages. Age and number of conditions were reported as means with standard deviation (SD). Average scores for the SEMCD Scale and total summed scores for FallE Scale were calculated and used for most analyses (i.e., principal component analysis (PCA), correlations, and t-tests). Medians, proportions of participants with positive and negative score changes, and median differences were also calculated for Wilcoxon signed rank tests.

PCA (using oblimin rotation with delta set at 0.0 and suppressing coefficients below .4) were completed for individual and combined scales at baseline and post-intervention. Oblimin rotation was chosen due to the correlations between the scales. A series of four principal component analyses were performed to assess the factor structure of the SEMCD Scale and the FallE Scale (i.e., SEMCD Scale baseline, SEMCD Scale post-intervention, FallE Scale baseline, and FallE Scale post-intervention). Internal consistency reliability coefficients (≥.7 recommended; Field, 2007) were calculated using Cronbach alpha for each scale at both time points. For the final PCA the SEMCD Scale and FallE Scale scores were entered into a single PCA as an initial exploratory technique to assess potential overlap of self-efficacy concepts at both time points (i.e., SEMCD/FallE Scale baseline and SEMCD/FallE Scale post-intervention).

Spread and distribution of data were checked using box plots, histograms, Q-Q plots, means, and analysis of median rankings. Sensitivity analyses with and without the outliers were also completed to assess possible changes in outcomes due to outliers. Pearson correlations were performed to identify the
strength and direction of hypothesized relationships between the two types of self-efficacy at baseline and post-intervention. Due to data being evenly but not normally distributed, Wilcoxon signed tests were used to analyze proportions of participants who changed or stayed the same. Paired sample, two-tailed t-tests were performed for each question and for total scales (average score for SEMCD Scale and total summed score for FallE Scale).

**Results**

Among the participating course locations, there were 86 possible participants in the CDSMP workshops of which 63 (73.3%) successfully completed the course (attended 4+ of 6 sessions). Fifty-three out of a possible 86 agreed to participate in this study. Of those 53, 41 completed the required 4+ of 6 sessions as well as both SE scales. Only 36 of the 41 had answered all items for both scales at both time points. Final data analysis used the 36 participants with complete scale data.

Of those 36 participants, the mean age was 72.79 with 7 (20.5%) participants below the age of 65. Most of participants were female (77.8%). Most classified themselves as White (75%) and/or African American (25%). Of those reporting education level, 6% had some elementary or high school education, 30.3% reported having graduated from high school, 33.33% reported some college or technical school, and 30.3% reported having bachelor’s degree or higher. The leading five conditions reported by participants included hypertension (45.7%), high cholesterol (42.9%), arthritis (42.9%), diabetes (37.1%), and breathing/lung issues (31.4%). Those participants used in the final analysis reported an average of 3.63 conditions (SD ±2.5) and attended an average of 5.31 sessions (SD ± 0.749). See Table 3.1 for demographics from consenting participants.

**Data Distribution**

Listwise use of data (participants with fully complete scale scores) facilitated consistent comparisons across the results. Results were essentially unchanged before and following sensitivity checks for outliers. Based on boxplot visuals, outliers were generally evenly distributed around the mean for both scales (exception for FallE Scale items: “Steady on feet” and “Increase strength”). Outliers were retained based on these overall results. The scale scores and differences did not generally have a normal
distribution curve as assessed with Shapiro Wilkes tests; however, data did have even distribution around the means, close orientation of medians, and sample size >30 which permitted an assumption of approximately normal distributions of the sampling distributions (Field, 2009) needed to run correlations, Wilcoxon signed rank, and paired $t$-tests.

**Principal Component Analysis (PCA) and Reliability**

Table 3.2 provides the factor loadings and communalities for items at baseline and post-intervention for the individual SEMCD Scale and the FallE Scale. PCA of each individual scale loaded as expected based on prior scale reporting (Ritter & Lorig, 2014; Smith, Jiang, et al., 2012) with one factor only at baseline and post-intervention for each scale. Placement of both scales together into the PCA using exploratory oblique rotations loaded into two components delineated along the two scales with no double loadings above .37 for either baseline or post time points. Factor 1-conditions accounted for 56% of the variance at baseline or post. Factor 2-falls accounted for 13% of variance at baseline and 14.83 of variance post participation. Refer to Table 3.3 for more information. Reliability scores for SEMCD Scale were .94 and .95 for baseline and post-intervention scores, respectively (reported in Table 3.2). For the FallE Scale, scores were .81 and .79 which are considered acceptable alpha levels.

**Correlations**

The linear nature between SEMCD and FallE Scale scores was established via scatterplots. Correlations using Pearson’s and Spearman’s correlation coefficients were completed between the scales at each time point (i.e., baseline to baseline, post-intervention to post-intervention, and baseline to post-intervention). See Table 3.4 for summarized coefficients. Both within-scale correlations for baseline and post-intervention time points were significant at $p<.001$ as were between scale correlations for baseline SEMCD Scale and baseline FallE Scale, post-intervention SEMCD and FallE Scales, and baseline SEMCD Scale and post FallE Scale. Post SEMCD Scale score and baseline FallE Scale score were significant at $p=.049$. See Table 3.4 for specifics regarding Pearson correlations. Spearman correlations using ranked scores were also performed to fully address non-normal distribution. Similar significant levels were obtained. Spearman coefficients are available in appendices of dissertation Graham (2016).
Differences between Baseline and Post-Intervention

Wilcoxon Signed Rank test. A non-parametric Wilcoxon Signed Rank test was used to assess differences between baseline and post-intervention for the 36 participants with fully completed scale data. See TABLE 3.5 for item specifics using the Wilcoxon signed rank tests for individual scale items as well as total scale scores. For SEMCD Scale, 18 participants had a positive difference in post scores overall (improved SEMCD Scale score from baseline to post-intervention), 6 participants had negative differences (SEMCD Scale score decreased from baseline to post-intervention), and 12 participants kept same sum baseline and post-intervention; however despite more participants with positive changes, a Wilcoxon Signed Rank test failed to demonstrate a significant median increase in post-participation scores as compared to baseline SEMCD scores following participation in CDSMP ($z=0.257$, $p=.797$). The median of the differences for SEMCD was 0.83.

For the total scale summed scores on the FallE Scale, 19 participants had a positive difference in post scores (improved FallE Scale score from baseline to post), 9 participants had a negative difference (lower FallE Scale score at post intervention as compared to baseline), and 8 participants kept same sum baseline and post-intervention. The median of the differences for the FallE Scale scores was 1.0. The Wilcoxon signed rank test produced a statistically significant median increase in post-intervention scores as compared to baseline Fall SE scores following participation in CDSMP, ($z=2.073$, $p=.038$). This was a small to medium effect size ($r=.244$).

Paired $t$-tests. Table 3.6 lists mean and standard deviations (SD) for individual questions as well as total scale scores. Mean SEMCD Scale score and (SD) were 7.46 ($\pm1.74$) at baseline and 7.41 ($\pm1.86$) at post-intervention. No mean differences were significant for SEMCD Scale individual items or for the full scale. For the FallE Scale, mean baseline was 13.86 ($\pm1.68$) and 14.69 ($\pm3.26$) at post-intervention. The FallE Scale mean total score difference had a positive increase following the CDSMP course from baseline to post-intervention at 0.83 (95% CI, 0.0265-1.640). These mean differences were reflected in the statistically significant increase in SE as measured on the FallE Scale from baseline to post participation in the CDSMP course ($t (35)=2.097$, $p=.043$) with a medium effect size ($r=.327$). Two
individual questions on the FallE Scale also had substantial improvements: “find a way to get up if you fall” (t (35) =2.646, p=.012) and “find a way to reduce falls” (t (35) =2.786, p=.009).

**Discussion**

This study explored baseline and post-intervention relationships between the self-efficacy to manage conditions (SEMCD) and the self-efficacy to manage and prevent falls (Fall-related SE) for successful completers (4+ sessions) of CDSMP workshops. This study’s participants were different from recently published research on CDSMP. For example, the mean age of the participants included in this analysis was 72.9, 7.5 years higher than the 65.4 mean age reported from the *National Study of CDSMP* (Ory, Ahn, et al., 2013). The FallE Scale is typically used in AMOB/VLL programs as a measure of efficacy to manage falls. Participants from recent AMOB/VLL research using the FallE Scale, had a higher mean age, 77 years, (Ory et al., 2010) than did the participant sample in this research. There were a higher number of conditions reported in this study (3.63) as compared to 3.0 overall reported by Ory, Ahn, et al. (2013) for CDSMP. This could be a reflection of the older mean age since number of chronic conditions increases with age (Ward, Schiller, & Goodman, 2014); however, this age explanation would not be supported by recent data from the *National Study of CDSMP* where younger participants (age<65) had higher numbers of conditions and larger effect sizes on outcomes than the ≥65 group (Ory et al., 2014). The current participants were older and reported more conditions than the recent *National Study of CDSMP* results. Small sample size in this research prohibited exploration of differences by age or conditions. Future research could explore if age or number of conditions would be associated with greater changes in Fall-related SE following CDSMP participation as one might hypothesize given fall risk increases with number of conditions (Lawlor, Patel, & Ebrahim, 2003).

The PCA factoring as single components for each scale at both time points supported prior research that each scale represented a distinct construct or type of efficacy (Ritter & Lorig, 2014; Smith, Jiang, et al., 2012). The 2-component PCA division along the scale items (with no double loading >.37) when both scales were loaded at once further suggests distinct types of efficacy as measured by the two scales. The distinct types of self-efficacy represented by the SEMCD Scale and FallE Scale support the
task specific character of SE (Bandura, 1997) such as the task of managing falls or the task of managing conditions. The large and significant positive correlations and relationships between the scale scores justified the choice of oblimin type of rotation for PCA. These relationships were noted at either time point which suggests that the scales (SEMCD Scale and FallE Scale) might be related measures of different types of SE regardless of CDSMP workshop participation. Additional research could further explore participant understanding of the relationship between efficacies to manage falls (Fall-related SE) and to manage conditions (SEMCD).

As mentioned previously, changes to Fall-related SE following CDSMP participation had not been researched. Significant improvements in Fall-related SE following participation in evidenced-based fall management and prevention program (AMOB/VLL) have been well documented (Cho et al., 2015; Tennstedt et al., 1998). The positive proportional and magnitude changes noted in this research for the FallE Scale in participants following CDSMP should be further explored to determine if difference exists in other samples of CDSMP participants. Most surprising, one of the scale items that differed significantly from within the Fall-related SE (Getting up) is not specifically addressed anywhere within the CDSMP structured curriculum. While such changes in Fall-related SE are commonly measured and expected for older adult participants in fall prevention and management programs such as AMOB/VLL (Cho et al., 2015; Smith, Jiang, et al., 2012), these significant changes occurred following a general self-management program with limited direct instruction about fall prevention.

Although SE is specific to the task at hand (in this case managing conditions or managing falls), SE generalizes when mastery experiences have similar subskills. Skills such as problem solving are in both types of programs. Successful problem solving during the workshop might have transferred to Fall-related SE (Bandura 1997). The participants could believe they were capable to manage falls. Generalization of overarching self-regulatory skills (in this case perhaps self-management) could have also affected more specific perceptions of SE (Bandura, 1997). Future research with older adults could explore how CDSMP participants viewed Fall-related SE following workshop participation to gain additional understanding regarding changes to Fall-related SE within CDSMP. Researchers could
examine common skillsets (generalization of similar subskills from CDSMP to fall-related content) or explore possible overarching self-management influence discussed by Bandura (1997).

Limitations

Failure to find significant changes to the SEMCD Scale was somewhat unexpected given that SEMCD is a foundational construct for self-management in CDMSP. CDSMP is often associated with significant changes to the SEMCD with low to moderate effect sizes (Ritter & Lorig, 2014). In this study, there was a possible ceiling effect in the sample that could have limited the post-intervention SEMCD scores since the SEMCD Scale mean was already high at 7.46 (SD ±1.71) out of 10 at baseline. These high baseline scores indicate these participants were already confident about their ability to manage their conditions when they entered the program despite their older age and multiple conditions.

Other limitations arose from the type of data collected and the limited sample size. Both scales rely on self-report which may have resulted in recall bias or be influenced by other events co-occurring during the intervention. This current study’s small sample size (n=36) limited the power to detect change as significant as well as increased susceptibility to skewed results. Power was sufficient for correlations at .94; however the study was underpowered for the Wilcoxon Signed Rank Test (power at .48 for example for sum difference in FallE Scale) and for the t-tests (power for FallE Scale sum difference at .53). Since data collection did not reach the numbers needed for statistical power on the quantitative Phase 1 portion of the study, no analysis by group was performed. However, this study’s results were resilient following sensitivity testing regardless whether outliers were excluded or included. Results also remained consistent whether parametric or nonparametric testing was utilized in response to non-normal data. This consistency was due in part to the balanced distribution of outliers and general symmetrical spread of data on both sides of the mean/median. Although the study had limited power, the PCA results remained consistent with findings from other studies in terms of the individual scales and reliability (Ritter & Lorig, 2014). In spite the small sample and lack of normality, the general distribution of the data and consistency of results regardless of method lend support for the findings.
Additional limitations include lack of random assignment or comparison group (not participating in CDSMP) in the study design, which limited the ability to determine treatment effects from baseline to post-intervention. On a larger systems note, the frequent workshop cancellations due to inadequate numbers of participants limited recruitment opportunities for this study. Despite expanding the possible data collection area to the entire state and extending collection period, the sample size remained small. Partnering with larger, funded studies or agencies across states could have greatly extended recruitment opportunities and thus enlarged sample size.

Those adults who agreed to participate in this study may be different from others in CDSMP who did not choose to participate in this particular study but may have agreed to participation in other ongoing research such as a concurrent Medicare study. Ritter et al. (2014) commented on this type of bias associated with soliciting consent for a separate Medicare study from participants in the National Study of CDSMP; the consenting process for the Medicare study that was added produced a group of participants who were different from the main group in the main study in terms of number of conditions, use of healthcare visits, and even ethnicity. Similar differences could have arisen in this current research because some CDSMP study participants were also asked to enroll in a similar Medicare study to the one mentioned by Ritter et al. (2014).

There were several other limitations that should also be considered. Participants in this study are similar in comparison to recent studies using EBP for CDSMP and AMOB/VLL, for gender, race and education (mostly white women, completing at least high school) though not for age and number of conditions (Cho et al., 2015; Ory et al., 2014). The higher age and number of conditions in this sample might have produced a greater effect on the FallE Scale. In contrast, a younger sample with fewer conditions may show the expected changes in SEMCD and not Fall-related SE. SE is understood as a dynamic construct that may change at any time (Bandura, 1997), and CDSMP research generally has measured changes in SEMCD over a 6 month post period (Ritter & Lorig, 2014). This current research collected SE scale data generally at the last session rather than at six months which may have produced different results from the six month post measures associated with other CDSMP research. The data
collection associated with this study did provide a real time snapshot of changes following engagement in the CDSMP course that has not typically been presented in other research.

Given these exploratory results, additional research would be needed to clarify results further. SE, (SEMCD or Fall-related SE), is an important component of health promotion programs such as CDSMP and AMOB/VLL. Higher SE facilitates health outcomes and self-management of conditions and falls (Ritter & Lorig, 2014; Smith, Jiang, et al., 2012). Future studies should consider collecting baseline and post-participation scale data for both SE scales (SECMD scale and FallE Scale) across both CDSMP and fall prevention programs such as AMOB/VLL. This would facilitate comparison between groups taking these types of EBP and measure program potential impact on types of self-efficacy. Researchers should also explore if the shared content contained in AMOB/VLL such as action planning and emphasis on building mastery to manage falls can affect SEMCD. This could lead to more effective bundling and packaging of services for older adults.

**Conclusion**

CDSMP, as an EBP, facilitates building skills and SE to manage chronic conditions. A short segment to specifically address fall prevention was recently added to the standardized manual (Lorig, Gonzalez, & Laurent, 2012). Aging adults commonly face increasing risk for both chronic disease (Hung et al., 2011) and falls (Stevens et al., 2006) with disease-related problems increasing risk of falls (Lawlor, Patel, & Ebrahim, 2003); yet the relationship between Fall-related SE and SEMCD had not been explored until now. This exploratory research highlighted a relationship between SEMCD and Fall-related SE even before workshop participation. Given the preliminary results showing changes in Fall-related SE post participation in CDSMP, researchers may wish to consider exploring a broadened use of CDSMP as an early approach in fall prevention. Currently, the recommended evidenced based programs for older adults include both fall prevention programs such as AMOB/VLL and disease self-management programs such as CDSMP (Ory & Smith, 2015). This research takes an exploratory step toward an “inclusive approach to the effective management of chronic disease and the reduction of fall risk; an approach that values and enfolds the broad spectrum of healthy aging program offerings” advocated by Beattie (p. 62, 2014).
References


Disease Prevention and Health Promotion Services (OAA Title IIID). Retrieved 03.01.16, from http://www.AOA.ACL.gov/AOA_Programs/HPW/Title_IIID/index.aspx


### Table 3.1.

**Participant Baseline Characteristics**

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<th>Consented but not included in analysis</th>
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<td></td>
<td>Mean (±SD)</td>
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<td>Mean (±SD)</td>
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<tr>
<td>Age in years</td>
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<td>Number of conditions reported per person</td>
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<td>Number of sessions attended per person</td>
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<td>3.31(±1.89)</td>
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</table>

<table>
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<tr>
<th>N varies with # responses</th>
<th>N (%)</th>
<th>N (%)</th>
<th>N (%)</th>
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</thead>
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<td>N=36</td>
<td>N=16</td>
</tr>
<tr>
<td>Female</td>
<td>41(78.8)</td>
<td>28(77.8)</td>
<td>13(81.3)</td>
</tr>
<tr>
<td>Male</td>
<td>11(21.1)</td>
<td>8(22.2)</td>
<td>3(18.8)</td>
</tr>
<tr>
<td>Race/ethnicity (more than one possible)</td>
<td>N=44</td>
<td>N=35</td>
<td>N=12</td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>33(75.0)</td>
<td>27(75)</td>
<td>8(66.7)</td>
</tr>
<tr>
<td>African American</td>
<td>13(29.5)</td>
<td>9(25)</td>
<td>5(41.7)</td>
</tr>
<tr>
<td>American Indian</td>
<td>4(7.5)</td>
<td>4(8.3)</td>
<td>1(8.3)</td>
</tr>
<tr>
<td>Asian</td>
<td>2(4.5)</td>
<td>2(2.8)</td>
<td>1(8.3)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Education</td>
<td>N=41</td>
<td>N=33</td>
<td>N=11</td>
</tr>
<tr>
<td>Some elementary to high school</td>
<td>4(9.8)</td>
<td>2(6.06)</td>
<td>2(18.2)</td>
</tr>
<tr>
<td>High school graduate or GED</td>
<td>10(24.4)</td>
<td>10(30.30)</td>
<td>0</td>
</tr>
<tr>
<td>Some college or technical school</td>
<td>17(41.5)</td>
<td>11(33.33)</td>
<td>7(63.6)</td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>10(24.4)</td>
<td>10(30.30)</td>
<td>2(18.2)</td>
</tr>
<tr>
<td>Chronic conditions</td>
<td>N=43</td>
<td>N=35</td>
<td>N=11</td>
</tr>
<tr>
<td>Alzheimer’s/Dementia</td>
<td>1(2.3)</td>
<td>1(2.9)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Osteoarthritis/Rheumatoid arthritis</td>
<td>22(51.2)</td>
<td>15(42.9)</td>
<td>8(72.7)</td>
</tr>
<tr>
<td>Breathing/Lung</td>
<td>12(27.9)</td>
<td>11(31.4)</td>
<td>1(9.1)</td>
</tr>
<tr>
<td>Cancer</td>
<td>3(7.0)</td>
<td>3(8.6)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Chronic pain</td>
<td>11(25.6)</td>
<td>7(20)</td>
<td>5(45.5)</td>
</tr>
<tr>
<td>Depression/Anxiety</td>
<td>10(23.3)</td>
<td>10(28.5)</td>
<td>1(9.1)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>19(44.2)</td>
<td>13(37.1)</td>
<td>7(63.6)</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>8(18.6)</td>
<td>6(17.1)</td>
<td>2(18.2)</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>20(46.5)</td>
<td>15(42.9)</td>
<td>6(54.5)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>21(48.8)</td>
<td>16(45.7)</td>
<td>7(63.6)</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>6(14)</td>
<td>5(14.3)</td>
<td>1(9.1)</td>
</tr>
<tr>
<td>Stroke</td>
<td>4(9.3)</td>
<td>2(5.7)</td>
<td>3(27.3)</td>
</tr>
<tr>
<td>Other conditions</td>
<td>19(44.2)</td>
<td>14(38.9)</td>
<td>4(36.4)</td>
</tr>
</tbody>
</table>

Note. Total possible N=16 and includes 7 who did not complete 4+ of 6 sessions; 6 with incomplete or missing scales; 3 who consented and course was cancelled. SD=Standard deviation
Table 3.2

**Principal Component Analysis of SEMCD Scale and FallE Scale**

<table>
<thead>
<tr>
<th>SEMCD Scale Items (confidence to…)</th>
<th>Baseline (α = .935)</th>
<th>Post-Test (α = .950)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor loading</td>
<td>Communality estimates</td>
</tr>
<tr>
<td>1. Keep fatigue from interfering with the things you want to do?</td>
<td>.93</td>
<td>.87</td>
</tr>
<tr>
<td>2. Keep pain/physical discomfort from interfering with the things you want to do?</td>
<td>.90</td>
<td>.81</td>
</tr>
<tr>
<td>3. Keep emotional distress from interfering with the things you want to do?</td>
<td>.93</td>
<td>.87</td>
</tr>
<tr>
<td>4. Keep other symptoms from interfering with the things you want to do?</td>
<td>.94</td>
<td>.89</td>
</tr>
<tr>
<td>5. Do the different task and activities needed to manage so as to reduce your need to see a doctor?</td>
<td>.64</td>
<td>.40</td>
</tr>
<tr>
<td>6. Do things other than just taking medications to reduce how much your illness affects your everyday life?</td>
<td>.91</td>
<td>.82</td>
</tr>
<tr>
<td>Eigenvalues</td>
<td>4.66</td>
<td>4.8</td>
</tr>
<tr>
<td>% variance</td>
<td>77.59</td>
<td>80.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FallE Scale Items (how sure are you that you can…)</th>
<th>Baseline (α = .810)</th>
<th>Post-Test (α = .790)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor loading</td>
<td>Communality estimates</td>
</tr>
<tr>
<td>1. Find a way to get up if you fall</td>
<td>.79</td>
<td>.62</td>
</tr>
<tr>
<td>2. Find a way to reduce falls</td>
<td>.69</td>
<td>.47</td>
</tr>
<tr>
<td>3. Protect yourself if you fall</td>
<td>.82</td>
<td>.68</td>
</tr>
<tr>
<td>4. Increase your physical strength</td>
<td>.66</td>
<td>.44</td>
</tr>
<tr>
<td>5. Become more steady on your feet</td>
<td>.80</td>
<td>.64</td>
</tr>
<tr>
<td>Eigenvalues</td>
<td>2.85</td>
<td>2.92</td>
</tr>
<tr>
<td>% variance</td>
<td>56.89</td>
<td>58.31</td>
</tr>
</tbody>
</table>

Note. SEMCD Scale = Self-Efficacy to Manage Chronic Conditions; FallE Scale = Fall Efficacy Scale
Table 3.3.

Principal Component Analysis of Combined SEMCD Scale and FallE Scale Items

<table>
<thead>
<tr>
<th>SEMCD Scale Items (confidence to..)</th>
<th>Baseline</th>
<th></th>
<th>Post-Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor 1-conditions</td>
<td>Factor 2-falls</td>
<td>Factor 1-conditions</td>
<td>Factor 2-falls</td>
</tr>
<tr>
<td>1. Keep fatigue from interfering with the things you want to do?</td>
<td>.85</td>
<td>.14</td>
<td>.92</td>
<td>.02</td>
</tr>
<tr>
<td>2. Keep pain/physical discomfort from interfering with the things you want to do?</td>
<td>.75</td>
<td>.25</td>
<td>.81</td>
<td>.11</td>
</tr>
<tr>
<td>3. Keep emotional distress from interfering with the things you want to do?</td>
<td>.84</td>
<td>.18</td>
<td>.82</td>
<td>.01</td>
</tr>
<tr>
<td>4. Keep other symptoms from interfering with the things you want to do?</td>
<td>.89</td>
<td>.10</td>
<td>.97</td>
<td>-.05</td>
</tr>
<tr>
<td>5. Do the different task and activities needed to manage so as to reduce your need to see a doctor?</td>
<td>.80</td>
<td>-.25</td>
<td>.86</td>
<td>.03</td>
</tr>
<tr>
<td>6. Do things other than just taking medications to reduce how much your illness affects your everyday life?</td>
<td>.84</td>
<td>.13</td>
<td>.92</td>
<td>-.05</td>
</tr>
</tbody>
</table>

FallE Scale Items (how sure are you that you can…)

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Find a way to get up if you fall</td>
<td>.07</td>
<td>.74</td>
<td>-.22</td>
<td>.63</td>
</tr>
<tr>
<td>2. Find a way to reduce falls</td>
<td>.18</td>
<td>.59</td>
<td>.37</td>
<td>.59</td>
</tr>
<tr>
<td>3. Protect yourself if you fall</td>
<td>.14</td>
<td>.74</td>
<td>.14</td>
<td>.78</td>
</tr>
<tr>
<td>4. Increase your physical strength</td>
<td>-.18</td>
<td>.80</td>
<td>.27</td>
<td>.73</td>
</tr>
<tr>
<td>5. Become more steady on your feet</td>
<td>.28</td>
<td>.63</td>
<td>.13</td>
<td>.72</td>
</tr>
</tbody>
</table>

Eigenvalues | 6.21 | 1.44 | 6.18 | 1.63 |
% of Variance | 56.41 | 13.06 | 56.19 | 14.83 |
Table 3.4.

Correlations for SEMCD Scale and FallE Scale at Baseline and Post-intervention in CDSMP Workshop (N=36)

<table>
<thead>
<tr>
<th></th>
<th>Pearson’s r</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline SEMCD Scale and post SEMCD Scale</td>
<td>.57***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Baseline SEMCD Scale and baseline FallE Scale</td>
<td>.61***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Baseline SEMCD Scale and post FallE Scale</td>
<td>.69***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Post SEMCD Scale and baseline FallE Scale</td>
<td>.33*</td>
<td>.049</td>
</tr>
<tr>
<td>Post SEMCD Scale and post FallE Scale</td>
<td>.52**</td>
<td>.001</td>
</tr>
<tr>
<td>Baseline FallE Scale and post FallE Scale</td>
<td>.74***</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

2-tailed significance *P<0.05, **P<0.01, ***P<0.001
Table 3.5.

(*Wilcoxon Signed Rank Tests for SEMCD Scale and FallSE Scale Scores Post-Intervention Minus Baseline in CDSMP Workshop (N=36)

<table>
<thead>
<tr>
<th>SEMCD Scale Items (confidence to...)</th>
<th>Positive*</th>
<th>Neutral**</th>
<th>Negative***</th>
<th>test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Keep fatigue from interfering with the things you want to do?</td>
<td>10</td>
<td>18</td>
<td>8</td>
<td>-0.286</td>
<td>.775</td>
</tr>
<tr>
<td>2. Keep pain/physical discomfort form interfering with the things you want to do?</td>
<td>12</td>
<td>13</td>
<td>11</td>
<td>0.214</td>
<td>.830</td>
</tr>
<tr>
<td>3. Keep emotional distress from interfering with the things you want to do?</td>
<td>13</td>
<td>14</td>
<td>9</td>
<td>0.573</td>
<td>.567</td>
</tr>
<tr>
<td>4. Keep other symptoms from interfering with the things you want to do?</td>
<td>12</td>
<td>15</td>
<td>9</td>
<td>0.317</td>
<td>.751</td>
</tr>
<tr>
<td>5. Do the different task and activities needed to manage so as to reduce your need to see a doctor?</td>
<td>12</td>
<td>11</td>
<td>13</td>
<td>-0.780</td>
<td>.435</td>
</tr>
<tr>
<td>6. Do things other than just taking medications to reduce how much your illness affects your everyday life?</td>
<td>10</td>
<td>16</td>
<td>10</td>
<td>-0.659</td>
<td>.510</td>
</tr>
<tr>
<td>SEMCD Scale (possible scores from 0 to 10)</td>
<td>18</td>
<td>12</td>
<td>6</td>
<td>0.257</td>
<td>.797</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FallSE Scale Items (how sure are you that you can...)</th>
<th>Positive*</th>
<th>Neutral**</th>
<th>Negative***</th>
<th>test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Find a way to get up if you fall</td>
<td>13</td>
<td>21</td>
<td>2</td>
<td>2.387</td>
<td>.017</td>
</tr>
<tr>
<td>2. Find a way to reduce falls</td>
<td>15</td>
<td>17</td>
<td>4</td>
<td>2.599</td>
<td>.009</td>
</tr>
<tr>
<td>3. Protect yourself if you fall</td>
<td>12</td>
<td>16</td>
<td>8</td>
<td>0.778</td>
<td>.437</td>
</tr>
<tr>
<td>4. Increase your physical strength</td>
<td>9</td>
<td>19</td>
<td>8</td>
<td>-0.232</td>
<td>.817</td>
</tr>
<tr>
<td>5. Become more steady on your feet</td>
<td>8</td>
<td>19</td>
<td>9</td>
<td>0.25</td>
<td>.802</td>
</tr>
<tr>
<td>FallSE Scale (possible scores from 1 to 4)</td>
<td>19</td>
<td>8</td>
<td>9</td>
<td>2.073</td>
<td>.038</td>
</tr>
</tbody>
</table>

*positive difference = improvement in scale scores from baseline to post-intervention
**neutral = no change from baseline to post-intervention
***negative difference = decrease in scale scores from baseline to post-intervention
Table 3.6.

*Paired Sample T-tests for SEMCD Scale and FallE Scale Scores Post-Intervention Minus Baseline in CDSMP Workshop (N=36)*

<table>
<thead>
<tr>
<th>SEMCD Scale Items (confidence to…)</th>
<th>Baseline Mean (±SD)</th>
<th>Post Mean (±SD)</th>
<th>Paired Differences</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean diff(±SD)</td>
<td>t (df35)</td>
<td>SE</td>
<td>p</td>
</tr>
<tr>
<td>1. Keep fatigue from interfering with the things you want to do?</td>
<td>7.19±2.08</td>
<td>7.08±2.14</td>
<td>-0.11±1.85</td>
<td>0.31</td>
</tr>
<tr>
<td>2. Keep pain/physical discomfort form interfering with the things you want to do?</td>
<td>7.22±2.22</td>
<td>7.25±2.06</td>
<td>0.03±2.30</td>
<td>0.072</td>
</tr>
<tr>
<td>3. Keep emotional distress from interfering with the things you want to do?</td>
<td>7.31±1.97</td>
<td>7.50±1.99</td>
<td>0.19±2.15</td>
<td>0.543</td>
</tr>
<tr>
<td>4. Keep other symptoms from interfering with the things you want to do?</td>
<td>7.36±1.96</td>
<td>7.42±2.10</td>
<td>0.06±2.30</td>
<td>0.145</td>
</tr>
<tr>
<td>5. Do the different task and activities needed to manage so as to reduce your need to see a doctor?</td>
<td>7.67±2.14</td>
<td>7.42±2.06</td>
<td>-0.25±1.71</td>
<td>0.29</td>
</tr>
<tr>
<td>6. Do things other than just taking medications to reduce how much your illness affects your everyday life?</td>
<td>8.03±1.63</td>
<td>7.81±2.10</td>
<td>-0.22±2.00</td>
<td>0.33</td>
</tr>
<tr>
<td>SEMCD Scale (possible scores from 0 to 10 *modified)</td>
<td>7.46±1.74</td>
<td>7.41±1.86</td>
<td>-0.051±1.68</td>
<td>0.182</td>
</tr>
</tbody>
</table>

(continued)
## FallE Scale Items (how sure are you that you can…)

<table>
<thead>
<tr>
<th>FallE Item</th>
<th>Baseline Mean (SD)</th>
<th>Baseline Mean (SD)</th>
<th>Paired Differences Mean diff(SD)</th>
<th>t (df35)</th>
<th>SE</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Find a way to get up if you fall</td>
<td>2.58(±0.97)</td>
<td>2.92(±0.02)</td>
<td>0.33(±0.76)</td>
<td>2.646</td>
<td>0.13</td>
<td>.012</td>
<td>0.08 - 0.59</td>
</tr>
<tr>
<td>2. Find a way to reduce falls</td>
<td>2.92(±0.91)</td>
<td>3.31(±0.75)</td>
<td>0.39(±0.84)</td>
<td>2.786</td>
<td>0.14</td>
<td>.009</td>
<td>0.11 - 0.67</td>
</tr>
<tr>
<td>3. Protect yourself if you fall</td>
<td>2.58(±0.94)</td>
<td>2.69(±0.89)</td>
<td>0.11(±0.85)</td>
<td>0.78</td>
<td>0.14</td>
<td>.441</td>
<td>-0.18 - 0.40</td>
</tr>
<tr>
<td>4. Increase your physical strength</td>
<td>3.00(±0.76)</td>
<td>2.97(±0.81)</td>
<td>-0.03(±0.81)</td>
<td>-0.206</td>
<td>0.14</td>
<td>.838</td>
<td>-0.30 - 0.25</td>
</tr>
<tr>
<td>5. Become more steady on your feet</td>
<td>2.78(±0.93)</td>
<td>2.81(±0.92)</td>
<td>0.03(±0.91)</td>
<td>0.183</td>
<td>0.15</td>
<td>.856</td>
<td>0.28 - 0.34</td>
</tr>
</tbody>
</table>

**FallE Scale Sum Mean (possible scores from 4 to 20)**

| FallE Scale Sum Mean (possible scores from 4 to 20)                        | 13.86(1.68)        | 14.69(3.26)        | 0.83(2.38)                       | 2.097    | 0.40| .043 | 0.03 - 1.64    |
Figure 3.1. CDSMP and types of self-efficacy. Visual depiction of self-efficacy to manage chronic condition (SEMCD), Fall-related self-efficacy (Fall-related SE) and participation in Stanford’s Chronic Disease Self-Management Program (CDSMP). Arrows represent potential influences in self-efficacy (SE) at baseline and post-intervention (participation in CDSMP).
Figure 3.2. Participant enrollment and use in analysis. CDSMP=Chronic Disease Self-Management Program; SEMCD Scale=Self-Efficacy to Manage Chronic Disease Scale; FallE Scale=Fall Efficacy Scale.
CHAPTER 4
A MIXED METHOD APPROACH TO UNDERSTANDING THE IMPACT OF OLDER ADULT 
CDSMP PARTICIPATION ON SELF-EFFICACIES TO MANAGE FALLS AND CHRONIC 
DISEASE

1 Graham, K.C. To be submitted to the Journal of Aging and Health
Abstract

Objectives

The Chronic Disease Self-Management Program (CDSMP) has a short segment on fall prevention, but its impact on fall-related self-efficacy (Fall-related SE) has been minimally investigated. This study explored the perceived impact of CDSMP participation on Fall-related SE as compared to self-efficacy to manage chronic conditions (SEMCD), and older adults’ understanding of relationships between these types of self-efficacy.

Methods

A sequential, mixed method study explored perceptions (n=36) regarding SE using the SEMCD Scale and the Fall Efficacy Scale (FallE Scale) at baseline and post-CDSMP participation and 15 semistructured interviews with participants 65+.

Results

Scale data and interviews indicated that SEMCD and Fall-related SE were related but distinct concepts; however, following CDSMP, participants perceived a broader sense of SE, that of SE to manage health that influenced both types of SE.

Discussion

Participants perceived CDSMP SE benefits that were broader than SECMD or Fall-related SE. It is recommended that these relationships be further explored.

Introduction

Chronic disease and falls are important health issues for older adults commonly addressed via evidenced-based programs (EBP) about disease management and fall prevention. Older adults face greater prevalence, cost, and decreased function as a result of chronic diseases than do younger adults (Hung, Ross, Boockvar, & Siu., 2011; West, Cole, Goodkind, & He, 2014). Chronic conditions and multiple chronic conditions increase with age; eight-five percent of those 65 and older have at least one chronic disease and 60 percent have two or more conditions (Ward, Schiller & Goodman, 2014). Costs rise with the number of chronic conditions. For example, those with six or more conditions comprised
just 13.5% of the Medicare recipients and yet accounted for close to half of all Medicare spending (Lochner, Goodman, Posner, & Parekh, 2013). Prevention and management of chronic disease through EBP, such as CDSMP, offers methods to improve health behaviors and decrease cost (Ahn, et al., 2013).

In addition to increasing prevalence of chronic disease and multiple conditions (Gerteis, et al., 2014), older adults face increasing risk of falls, injury due to falls, and even death (Stevens, Corso, Finkelstein, & Miller, 2006). Conditions and falls often co-occur which can also result in increasing risk of falls (Lawlor, Patel, & Ebrahim, 2003; Sibley, Voth, Munce, Straus, & Jaglal, 2014) and frailty (Fried et al., 2001). Certain conditions (such as stroke, arthritis, diabetes and osteoporosis) have also higher odds of being associated with falls (Chang & Do, 2015). Ganz, Alkema and Wu (2008) acknowledged that while falls are often acute issues, falls often result from chronic problems. The intersecting issues of chronic conditions and falls are usually addressed using complimentary but parallel approaches to self-management of conditions and falls (Ory & Smith, 2015). Beattie (2015) advocated for a broader approach to managing conditions that includes falls as a key component in disease management strategies.

Improving self-management of chronic conditions via evidenced-based programs such as Stanford’s Chronic Disease Self-Management Program (CDSMP) was identified by the Center for Disease Control as a main method to address the “burden of chronic disease” (Bauer, Briss, Goodman, & Bowman, 2014). CDSMP has been successfully used with multiple populations and conditions to facilitate self-management of conditions via improvements in health behaviors such as exercise, symptom management, self-efficacy, and reduced use of healthcare services (Brady et al., 2013; Gitlin et al., 2008; Lorig, Ritter, &Jacquez, 2005). The most recent CDSMP added a short 10-minute section on fall prevention and improving balance to the standardized CDSMP manual (Lorig, Gonzalez & Laurent, 2012). As a general program, CDSMP has many applications, yet limited research (Graham, 2016b) has explored whether CDSMP might have a role in fall prevention.

The earliest versions of CDSMP began as “atheoretical” but researchers added perceived self-efficacy into its developing theory after finding weak associations between changes in health status and
health behaviors (Lorig & Holman, 2003). The CDSMP authors chose self-efficacy to help explain the impact that feeling in control of health has on health status and behaviors (Lorig & Holman, 2003).

Bandura (2007) defined self-efficacy as “the belief in what one can do with whatever resources one can muster” (p. 646). As a predictor, moderator, and mediator in health behavior (Bandura, 1997), SE is included in most self-management models and many health promotion theories (Bandura, 1997, 2004; Lorig & Holman, 2003). SE can be facilitated through the use of mastery experiences, social modeling and persuasion and learning to reinterpret symptoms (Bandura, 1997). Lay leaders utilize these techniques during course instruction and practice of action planning, problem solving, and feedback to promote SE (Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001). This belief in capability to manage conditions then facilitates self-management behaviors (Ritter & Lorig, 2014). Fall prevention programs (FPP) often use SE to facilitate fall management and prevention (Smith, Jiang, & Ory, 2012). One such EBP program, A Matter of Balance/Volunteer Lay Leader (AMOB/VLL), seeks to build Fall-related Self-efficacy (Fall-related SE) as a program outcome as well as a facilitator of behaviors associated with fall management and prevention (Smith et al., 2012). SE was chosen as the primary construct to explore in this research due to its influence and use in managing conditions and managing falls.

SE should be considered as task-specific and therefore be measured using a scale that gathers perception of ability for a range of behaviors associated with the task at hand (Bandura, 1997). In other words, a person has and/or develops confidence about his or her perceived ability to master a specific task and this can be measured using a specific scale. CDSMP researchers have defined self-efficacy to manage chronic disease (SEMCD) as the confidence to manage chronic conditions (Lorig, Ritter, & Plant, 2005) and recommend that the Self-Efficacy to Manage Chronic Disease Scale (SEMCD Scale) be used to measure this type of SE at baseline and post-CDSMP intervention (Ritter & Lorig, 2014). Fall-related SE (Fall-related SE) can be defined as the confidence in one’s abilities to prevent or manage falls (Smith et al., 2012). Fall-related SE has been measured in AMOB/VLL programs using the FallE Scale (Smith et al., 2012). Both types of self-efficacy are predictive of future health status as well as used as program measures (Lorig et al., 2001; Smith et al., 2012). In summary, self-management programs like
CDSMP and AMOB/VLL use SE as a main component to develop and support self-management behaviors. CDSMP researchers typically measure changes using specific SE scales related to managing conditions (Ritter & Lorig, 2014; Lorig & Holman, 2003). EBP fall prevention programs such as AMOB/VLL use the FallE Scale to measure SE to manage falls (Smith et al., 2012).

Researchers working with aging adults have begun to call for interventions that take a broader look at issues such as chronic disease (Bauer et al., 2014; Beattie, 2015). CDSMP now includes a segment on fall prevention and balance. CDSMP also shares with AMOB/VLL a similar program focus to increase SE as method to improve target behaviors. Despite the recent change in CDSMP content to include falls, the possible intersection of CDSMP and applications to falls remains underexplored.

**Taking a pragmatic stance**

A research approach was needed that could link the purposes of the research with the procedures. The pragmatic stance adopted for this research permitted very different methods of understanding (Morgan, 2014; Feilzer, 2010) regarding possible changes to SE. Scale-driven constructs of SE were integrated together with the constructed meanings and experiences of older adults in order to develop a deeper understanding of SE and self-management. This sequential, mixed methods study provided an exploration of perceptions of SE following participation in a disease self-management program in order to better understand how participation in a self-management training program impacted perceptions of SE to manage disease and to prevent falls in older adults.

**Method**

As an exploratory study regarding Fall-related SE and CDSMP, it was important to capture different aspects of understanding from older adults who had participated in the program. A two-phased design facilitated this process. Phase 1 quantitative initial baseline and post self-efficacy scale scores (SEMCD Scale and FallE Scale) were collected and analyzed from CDSMP participants. Early and ongoing analysis of incoming Phase 1 baseline and post scale scores informed the development of the qualitative interview guide (Phase 2). This permitted a deeper exploration of these older adults’ understanding of self-efficacy and participation in the Chronic Disease Self-management Program.
(CDSMP). Full description of Phase 1 is given elsewhere (Graham, 2016b) but summarized here as it was integrated throughout Phase 2.

**Intervention: Chronic Disease Self-Management Program (CDSMP) and Self-Efficacy.**

CDSMP is an evidenced based, lay led program “designed to address the complex array of health issues and self-management behaviors that cut across different chronic illnesses” (Ory, Ahn, Jiang, Lorig et al., 2013, p. 1259). It occurs over six weekly 2.5 hour sessions. The most current content for CDSMP program can be found in the standardized, copyrighted program manual developed by Lorig et al. (2012). Content by session includes: *Session 1*- intro, mind-body, sleep, action plans; *Session 2*- feedback and problem solving, dealing with emotions, activity and exercise, fall prevention, improving balance, making action plans; *Session 3*- making decisions, managing pain and fatigue, exercise-endurance, relaxation, action plan; *Session 4*- breathing, eating, communication, problem solving, action plan; *Session 5*- food choices, medication, informed decisions, depression, positive thinking, action plan; *Session 6*- working with health care professions, weight, reflection and planning.

**Participants**

Agreement was obtained from state Division of Aging Services, local Area Agencies on Aging wellness coordinators, host facilities, and lay leaders to recruit participants and administer scales using IRB committee approved protocol. *Phase 1*: Using purposive, criterion sampling, participants were recruited by the second session from those attending CDSMP workshops in a Southeastern state. Initial eligibility criteria included attendance in session one or two, having a chronic disease, consenting to participate in study’s baseline and post data collection, and then successful completion of the program (attending four+ of six sessions). Baseline and post-intervention scale data were collected from consenting CDSMP participants over a 10 month period. Only those who completed all questions of the two main scales (6 item SEMCD Scale and 5 items FallE Scale) were included in the Phase 1 analysis. *Phase 2*: Consenting Phase 1 participants who were 65 and older and who had successfully completed the workshop were recruited to participate in semi-structured interviews through the use of purposive, criterion sampling. Males and minorities were prioritized for inclusion by contacting all those meeting
either of these criteria to elicit participation in the interview process to help counter typical CDSMP participation composed of mostly white women (Ory, Ahn, Jiang, Lorig, et al., 2013). Thirty Phase 1 completers 65 and over initially consented to interviews but during the course of soliciting interviews, six of those who had initially agreed later deferred participation (for a variety of reasons such as health issues or being out of town/inconvenient). Only older participants were recruited for the interviews to better capture possible relationships to Fall-related SE since fall incidence and injury increase with age. Recruitment continued until data saturation was reached at 15 interviews (Charmaz, 2006; Collins, 2010). All interview participants were given twenty-five dollars for their time.

**Measures – Phase 1**

**Demographic information.** Self-recorded demographic information included age, sex, race, ethnicity, chronic conditions, and education.

**SE scale measures.** Initial study-specific baseline measures SEMCD Scale, and FallE Scale were collected during session 1 or 2 of CDSMP and then again post-intervention (at final session or via phone follow up). The researcher or lay leader assisted those needing help to read and complete consent and scale forms.

**SEMCD Scale.** The Self-Efficacy to Manage Chronic Disease Scale (SEMCD Scale) used a modified 0-10 scale rather than 1-10 scale Likert scale rating modified for purposes of this research (0-not at all confident to 10-completely confident) to rate: How confident are you that you can keep the: 1) fatigue caused by your disease from interfering with the things you want to do? 2) physical discomfort or pain of your disease from interfering with the things you want to do? 3) emotional distress caused by your disease from interfering with the things you want to do? 4) any other symptoms or health problems you have from interfering with the things you want to do? 5) do the different tasks and activities needed to manage your health condition so as to reduce you need to see a doctor? 6) do things other than just taking medication to reduce how much you illness affects your everyday life?. Scores were reported as average scores for completed questions. The 6 question scale was recommended for use by Stanford CDSMP
researchers as a reliable measure of SEMCD with high internal consistency reliability of Cronbach alpha ranging from 0.88 to 0.95 (Ritter & Lorig, 2014).

**FallE Scale.** Baseline and post-participation Fall-related SE was measured using a five item, 1-4 Likert scale (not at all sure to very sure) to rate questions regarding their confidence to 1) find a way to get up if fall, 2) find a way to reduce falls, 3) protect self if fall, 4) increase physical strength, 5) become more steady on feet. Tennstedt et al. (1998) initially developed this scale for use with the original A Matter of Balance fall prevention program, and its use has continued in the peer-led version AMOB/VLL. Cronbach’s alpha has ranged from .76 (Tennstedt et al., 1998) to .87 (Cho et al., 2015; Smith et al., 2012). Scores were summed as a total score.

**Measures-Phase 2 Interviews.** A prior pilot study (Graham, 2014) regarding relationships between SE, managing chronic disease and managing falls in community dwelling older adults provided an initial trial of many of the sample core questions used for the current study. Initial quantitative data analysis of first 20 participants scale data from Phase 1 guided the development of the semi-structured interview guide used in the interviews. For example, questions were included to clarify the relationship between SEMCD and Fall-related SE noted in the Phase 1 initial analysis. The interview protocol was also piloted and revised with a CDSMP participant/lay leader for clarity and relevance. The final amended interview guide used for the study is available in appendices of full dissertation (Graham, 2016a). A total of 15 interviews were conducted. Interviews were intended to be approximately an hour in length though length varied by participant. During the interviews, each person’s baseline and post scale scores also provided direction and focus for questions. In general, interviews explored older adults’ understanding of SEMCD and Fall SE and perception of CDSMP impact on SE. Additional data sources included field notes made during or following collection of Phase 1 scale data as well as notes made following Phase 2 interviews. Notes included observations concerning the participant, setting, and other interactions noted as well as any procedural or conceptual memos.
Data Management

All names, places and other identifying information were altered to protect confidentiality and privacy. A master coding list for interview participants was kept in a password protected computer file and secured data files stored de-identified data for the duration of the study. Identifying data and all recordings were destroyed six-months after data collection was completed. The researcher transcribed verbatim all interviews. Interview participant demographic information, scale data and transcripts were uploaded into NIVO software program (QSR international, 11 edition, PRO) for ease of tracking data. All participants were given opportunity to view and change transcripts. Five of the 15 interview participants requested to see their transcripts. These participants were then also asked to review transcripts for accuracy or issues (member check). Two of the five transcripts sent back to participants were returned to researcher. No changes or comments were requested on either of the returned transcripts.

Analysis

By design, the analysis was integrative in type as opposed to component (Greene, 2007). The sequenced design and developmental purpose established preset opportunities for integrated analysis since Phase 1 analysis influenced both the direction of questions and later coding in Phase 2. For the purpose of complimentarity (using different measures to understand SE), final analysis of Phase 1 scale data were then compared with Phase 2 interviews. The research analysis followed Greene’s (2007) framework for mixed methods analysis and included data cleaning and reduction, transformation, correlation and comparison, and final analysis toward development of warranted inferences.

Data cleaning and reduction. Quantitative data was cleaned (only listwise participant scale data were retained for main SE scales), reduced to frequencies, descriptive statistics, and correlated (between phases and types of data).

Phase 1 final analysis. Final data from baseline and post SE scales were entered into SPSS. More detailed analysis is available in a related article on the quantitative results (Graham, 2016b), PCA using oblimin rotation and internal consistency reliability using Cronbach’s alpha were completed for individual and combined scales at baseline and post. Descriptive statistics and analysis of data
distribution were used to understand spread of data. Researcher analyzed nonparametric Spearman’s Rho and parametric Pearson’s correlation to explore relationships between the SEMCD Scale and the FallE Scale at baseline and post CDSMP intervention. In addition, Wilcoxon signed-rank tests and paired t-test were completed to test for differences in scales post participation in CDSMP.

**Phase 2 quantitative analysis.** Due to outlier impact viewed on scatterplots as well as non-normal data, nonparametric analyses (Spearman’s Rho and Wilcoxon Signed Rank Tests) were used to analyze the subgroup of interview participants. Demographics were computed using means and frequencies.

**Initial qualitative analysis.** Three exploratory coding mechanisms as described by Saldana (2014) were followed during the analysis of the interview transcripts and participant data: a) initial coding using IN VIVO, and process codes, b) structural coding based on questions related to participation in CDSMP and the specific types of SE, and c) magnitude (counts) coding in conjunction with use of NVIVO. As recommended by Charmaz (2014), initial coding for this research used line by line gerund coding and then progressed in later interviews and analysis to focused coding in the constant comparative method to develop categories of action. Coding of later interviews also helped to clarify meanings and develop emerging categories. These coding processes informed final analytic categories and comparative analysis from which the final conceptual category, meta-categories, and categories emerged.

Memo-writing was used throughout the analysis process to capture ideas about codes, participants, possible comparisons between codes, and during the categorization process to clarify or explore both commonalities and inconsistencies (Charmaz, 2014). General memos were kept in a dated journal with topic headings. Memos specific to a code or participants were generally attached directly to that source via the NVIVO 11Pro software (QSR international). The use of NVIVO facilitated comparisons and organization of coding and memos as well as facilitated searching for key phrases or groupings of codes or memos. Memos were then analyzed by researcher using the constant comparative method. As metacategories emerged, existing memos were reviewed for salience and put aside if not
relevant to final analysis. New analytic memos were completed during the analysis to facilitate building relationships between categories.

**Data transformation.** Data was transformed by qualitizing numerical data arising from interviews as described by (Greene, 2007; Bazeley, 2010). Placement of all interview participants whose FallE Scale scores improved into a code named *Improving FallE Scale* was an example of qualitizing or transforming numerical data. NVIVO facilitated ease of qualitizing demographics and scale data through the use of classifications and attributes as spreadsheet oriented data entry that could be compared to codes as well as other participants (Bazeley, 2010; Bazeley & Jackson, 2013). Additional use of counts and frequencies such as the number of codes, references, or participants within a certain code or category facilitated comparisons. Transforming the qualitative data permitted comparison and identification of similarities and differences in both types of data sources for the same participant and across participants.

**Data correlation and comparison.** Greene (2007) identified the data correlations and comparisons such as used in Phase 1 as additional strategies to interactively analyze types or categories of data after initial coding and analysis. In this study, *data importation* (importation of midstream results from the analysis of one data type into the analysis of a different data type) as described by Greene (2007, p. 148), allowed midstream quantitative analysis to inform the initial and ongoing coding of interview transcripts before Phase 1 data collection finished. The results from this analysis helped form coding choices of the qualitative data (especially for structural codes) and to explore ways the Phase 1 quantitative results were similar or different from the interview findings.

**Final analyses.** Final analyses to draw conclusions and inferences were completed based on the blending of quantitative and qualitative findings (Greene, 2007). As suggested by Charmaz (2014) and Bazeley and Jackson (2013), later analyses included diagramming, review of memos, concept mapping, NVIVO matrix searches between codes and participants, exploration of negative cases integrating analysis to date as well as reflecting back on earlier coding and the development of analytic memos. As a result of this reflective process, structural coding based on separated aspects of SE types was relegated to support and inform but not dictate categories and inferences. Several categories developed from the
use of focus coding, constant comparative method, and analytic coding. For example *Changing confidence* as well as subcategories such as *Being inter-related* (types of efficacy) emerged as how participants viewed CDSMP in relation to SE. After the emergence of these categories, analytic memos, additional conceptual coding, and NVIVO concept mapping were used to develop and clarify conceptual and then metacategories such as *Giving me more*. Finally, key assertions were developed incorporating aspects of quantitative and the qualitative analysis in conjunction with existing theoretical understandings of self-efficacy and self-management.

**Results**

**Demographics**

See Table 4.1 for the participation recruitment and record including those participants who consented to the study but were not used due to failure to complete workshop (4+ sessions) or missing significant scale data. CDSMP workshop locations included retirement communities, area agency on aging locations and senior centers.

**Phase 1-Quantitative.** Fifty-three CDSMP workshop participants were recruited for this research from three regional Area Agencies on Aging (both recruitment area and timeframe were extended in attempt to recruit more participants). From the 41 consenting participants who had completed 4+ of 6 sessions and both scales, only 36 participants were included in Phase 1 quantitative analysis due to missing items within scales for other participants. Refer to Table 4.2 for specifics.

**Phase 2-Interviews.** Interview participants were recruited from Phase 1 participants at time of initial consent. Criteria for inclusion in Phase 2 included: being 65 or older, consent to a possible interview, completion of 4+ sessions of workshop, and completion of both SE scales. Fourteen of interview participants were included as part of the n=36 for Phase 1 data. An additional participant who had been dropped from final Phase 1 analysis due to one missing scale item was also included for Phase 2 interviews. The pragmatic research stance permitted the demographic information to be verified and updated as needed with the interview participants during interview process (Feilzer, 2010).
Of those 36 participants in Phase 1, the mean age was 72.79 with 7 (20.5%) participants below the age of 65. For the Phase 2 interviews, mean age was 76.24. Most of participants were female (Phase 1: 77.8%; Phase 2: 73.3%) and self-reported as White/Caucasian (Phase 1: 75%; Phase 2: 73.3%) and/or African American (Phase 1: 25%; Phase 2: 26.7%). For education level, 6% had only some elementary or high school education in both phases, 30.3% in Phase 1 reported high school or GED compared to 46.7% of those Phase 2. Participants in both phases reported the same top five conditions: hypertension, high cholesterol, arthritis, diabetes, and breathing/lung issues with an average 3-4 conditions (Phase 1, 3.63; Phase 2, 4.33 conditions). See Table 4.2 for further specifics of Phase 1 and Phase 2 groups. Home situation and prior/current use of health promotion activities was not assessed in Phase 1 but this data emerged during Phase 2 interview process; 14 of the 15 interviewed participants lived within some form of retirement community and/or regularly participated in health-related programs at the senior centers and regional Area Agencies on Aging.

**Summary of Phase 1 quantitative results**

When PCA analysis of SEMCD Scale and FallE Scale were entered individually, both scales loaded on single components at baseline and post. When entered together as “one scale,” the scales loaded on two separate components with no double loadings over .37. Cronbach’s alphas were acceptable for both scales at baseline and post measures (SEMCD Scale baseline α=.935, post α=.950; FallE Scale baseline α=.810, post α=.790). Scale PCA analysis indicated that these scales are separate constructs of self-efficacy. High correlations between the scales at both baseline and post-intervention (ranging from r=.331 to .669, significant at p<.05 or higher) indicated that these SE scales, while separate constructs as established by the PCA, were related to one another. In addition, the FallE Scale significantly changed in proportion and magnitude at post-CDSMP participation. See Graham (2016b) for more information regarding the Phase 1 data results.

**Phase 2 quantitative results**

Data analyses for the 15 interview participants was similar to the larger n=36 total group used in phase 1 analysis for relationships between scales. Correlations using Spearman’s rho were significant at
p<.05 between the scales at either time points. Neither scale had significant changes in the proportions of those participating in Phase 2 interviews (positive or negative). See Table 4.3 and 4.4 for specifics.

**Phase 2 qualitative results**

As the prioritized method in this mixed method study, the semi-structured interviews permitted exploration of the rich narratives left untold by the scale data collection for Phase 1. Inconsistencies and consistencies emerged through going back and forth between the structural codes applied to the questions about CDSMP effects on SE, interview narratives regarding changes to SE, and the existing quantitative and demographic information, a network of consistencies and inconsistencies emerged in the data.

Structural coding such as *positive increase in Fall-related SE* captured initial researcher understanding arising from the quantitative Phase 1 data; Coding in this manner separated comments by type of SE to support the Phase 1 findings that SE scales represented distinct yet related types of SE. This form of coding proved inadequate to capture the richness and diverse perspectives from the narrative. The older adults who were interviewed viewed their efficacies to manage falls and manage conditions more fluidly than permitted by quantitative distinctions based on the efficacy scales. The quantitative baseline and post-intervention data and the directed interview questions that arose from the developmental design did provide useful comparative data toward understanding how SE might be impacted following CDSMP.

During the constant comparative process and analytic memos, coding was reoriented to participating in CDSMP and participants’ views of efficacy rather than dictate codes based on scale responses. From this re-orientation, two main metacategories emerged: the interviewees viewed CDSMP as *Giving Me More* and *Reinforcing What I Know*. Neither of the metacategories was mutually exclusive across the types of self-efficacy nor within individuals. For example, one participant’s SEMCD might have fallen generally under the *Giving Me More* category while her Fall-related SE might have been more in *Reinforcing What I Know* category. Refer to Table 4.5 for summary of metacategories and categories with supporting codes. Figure 4.1 provides a visual depiction of relationships of the categories and workshop participation. In the following sections, these metacategories will be described in detail with supporting examples.
Metacategory-Reinforcing what I know

The main metacategory, Reinforcing What I Know arose in response to those participants who found sections of the workshop interesting but not particularly helpful as well as to those who perceived the workshop sections as just reinforcing knowledge and skills. This applied to a smaller portion of respondents and narrative from the interviews yet represented an important dimension of perception of CDSMP impact and thus was included here. Occasionally during the interviews, participants reported that the workshop just reinforced what they already knew about whatever skill or topic. Some of the focused coding for the Reinforcing What I Know category included: already knowing what to do, agreeing with leaders, reaffirming how felt, and not applying to me. Coding included comments such as the CDSMP workshop “reaffirmed how I felt about falling” (participant 21). Participant 20 said, “No, I have always been very up on things like this. So a lot of it I knew. But it was good to get the review on it.” Of the seven interview respondents with comments coded in this section, only one of the seven had neutral changes in either scale scores (that one might expect if the workshop was just a review). Four of seven had a positive change in SEMCD Scale and two of seven had positive changes on FallE Scale. Narrative text and process-oriented inductive coding help enhance understanding that scale data alone would not have captured. In summary, this category highlighted that while some aspects the workshop may not have provided new information nor stimulated changes in SE, participants still viewed information and the experience as reinforcing to their existing self-management or confidence levels.

Metacategory-Giving Me More.

This metacategory formed the bulk of the coding and discussion for CDSMP participation in relation to SE and self-management. It reflected actions and beliefs of the participants that changed as a result of CDSMP participation. It included the categories Changing confidence, Changing competence, Becoming more aware, and Seeing others like me. While each of these categories potentially was influenced by and influenced SEMCD and Fall-related SE, the different aspects of self-efficacy were categorized especially within the Changing confidence category.
Changing confidence. This category incorporated both positive and negative changes in SE whether for SEMCD or Fall-related SE. Participants were asked specifically about workshop impact and SEMCD and Fall-related SE. The subcategories and focused codes arising from those conversations and later constant comparative analysis included: being inter-related (types of confidence), positively changing, and negatively changing.

Changing confidence-positive. Focused coding in this area included: thinking - hey I can do this, talking about goals, changing confidence for good, making me better, increasing confidence to manage whatever. Phase 1 data analysis noted significant changes only in Fall-related SE post workshop participation. Six of the 15 interviewees discussed CDSMP as specifically affecting both SEMCD and Fall-related SE but in an inter-related manner. Participant 36 noted, “They (SEMCD and Fall-related SE) are very, very inter-related that they feed on each other.” He further described the workshop as “affecting your confidence to manage whatever.” Whatever in this case references both falls and conditions as well as other health related concerns. Speaking about the relationship between Fall-related SE and SEMCD, participant 5 described Fall-related SE – “it works - it works the same way” as SEMCD. She clarified her statement saying, “Well, you know because uh-when you manage a thing, it gives you confidence. Cause I have fell - that’s why I know to stay away from things I have fell from.” When asked what “it” was, she answered, “Whatever it is.” For these participants, “it” was the ability to manage and/or the perceived ability to manage rather than what was managed. By managing something, confidence emerges. The participants viewed CDSMP of helping with the skills to manage in general; it was uncommon during the interviews to find participants recounting CDSMP as only affecting SEMCD or Fall-related SE. Fall-related SE and SEMCD are clearly different based on both Phase 1 analysis and participant experiences. Yet, according to the participant, they work the same way. She later responded when asked if the workshop negatively affected her confidence saying, “No!. Everything was good. Everything they touched on-in the circle, it was good. There wasn’t nothing negative. It gave me confidence. I can do this.” She speaks in general terms for confidence and being able to do. The dual aspect of broadly based
confidence and general management skill provides an excellent example of incomplete nature of the scale efficacy distinctions. She did not differentiate in terms of either type of SE measured by the scales.

For those participants like participant 5, the action or doing of managing falls or conditions produced increased confidence. For some like participant 29, CDSMP directly provided “confidence in what you are doing and what you try to do.” Participants often talked about this sense of doing and accomplishment surrounding their self-management but might not have labeled it as confidence nor attributed it to a type of confidence. For participant 37, his confidence arose only after doing something; “setting goals and achieving them gives you the confidence to keep going. And allows you to say, hey, I can do it.” CDSMP for this participant helped reinforce successful actions such as exercise. SE emerged from and supported successful action. The SE in his examples was general like that of participant 5.

*Changing confidence-negative.* For several interview participants, their scores on one or both of the scales went down several points at the post-CDSMP participation. While typical quantitative scale analysis might treat these participant scores as potential outliers to be discarded, this mixed methodology allowed these participants’ perceptions to be explored in depth. Participants explained decreases in their scale scores post workshop participation for a variety of reasons. Generally, when attempting to articulate why their scores (for individual items and/or entire scale) might have decreased, these older adults described negative events co-occurring during workshop participation such as receiving notification of falling blood counts or experiencing a fall or near fall rather than anything attributed to the participating in CDSMP. In addition, several reflected that since they completed the scales blind without seeing their initial score, they did not believe that their confidence had in fact decreased despite the score decrease on the particular item(s). The interviews permitted exploration and clarification of changes on the SE scales from Phase 1.

Based on analysis of post changes in the SE scales for interview participants, 6 positively changed, 5 negatively changed, and 4 had no change on the SEMCD Scale. On the FallE Scale, the interview participants were evenly split 5, 5, and 5. Using Wilcoxon sign rank test, neither scale significantly changed post-intervention for the interview participants. Despite 1/3 of interview
participants having negative changes on both scales, when asked specifically if anything in the workshop decreased confidence, only two interviewed participants perceived this to be true. Participant 10 discovered physical limits when she tried to increase her exercise as recommended in the workshop. This limitation initially decreased her confidence; however, she noted “I was better equipped because I had a clearer insight—it was not something to be defeated about.” Discovery of a goal that she could not attain reset the boundaries for what her expectations should be. She went on to explain, “The next thing to do is to learn to live with the situation the way it is.” This increased awareness as a result of the workshop evolved into a separate category discussed below.

**Becoming aware.** This category encapsulated codes such as: *being better equipped, not having goals before class, setting mind, being aware, gradually affecting.* *Becoming aware* included developing insight into own conditions or safety, understanding the importance of daily activities such as exercising and taking medications as well as gaining knowledge about ways to effectively address health, conditions and falls during workshop participation. Participant 24 reported the workshop helped with his understanding specifically related to falls. He clarified his differences between managing conditions and managing falls saying, “Ah, I was managing my condition pretty good, but as far as falls it has made me more aware and be careful.” He identified the workshop as specifically enhancing his awareness and care regarding falls even though he had the max possible FallE Scale score (20/20) at baseline and post. The ceiling effect for this participant in FallE Scale was not able to capture the changes he perceived in his confidence gained from learning strategies to manage falls.

**Changing competence.** Changing competence emerged as a broad category with numerous subcategories. It included comments regarding specific methods workshop participation impacted their Doing for their ability to self-manage health, a specific condition, and/or falls. Unlike *Changing confidence*, all coding references were positive in relation to workshop influence. Subcategories of this category included *Planning action, Doing better, Doing more, Choosing, Exercising more, Learning new things, Managing Conditions, Managing falls, and Managing Health.* Participant 24 identified having specific goals and writing them down as different from her normal behavior. When asked if any of the
skills were new to her, she replied, “All of them. I mean, I would just normally think kind of like that, but I just never had a plan-never had goals. Didn’t write them down, -In my head –exercising didn’t have accountability.” This participant’s increased competence in goal setting assisted her to form an exercise class after CDSMP concluded. Participant 10 indicated, “One is to choose what you can achieve and not something else.” For this participant, it is the process and success of making plans and reaching goals rather than the product of what is actually done. One participant recounted reaching her goal of cleaning her closet by the next session. Perhaps that is one reason that participants could readily apply action planning beyond managing conditions to skills and tasks more associated with managing falls and the broader management of health.

Seeing others like me. The category, Seeing others like me, captured the importance of both social support and social modelling used within CDSMP. Focused coding included hearing from others like themselves, hearing problems solved, being able to ask for help, receiving encouragement, being embarrassed (if didn’t complete action plan), and If they can handle it,-then I can do it.. Participant 24 recounted that “hearing people, the problems they are going through” was a helpful aspect of being in the group. Participant 37 expanded on the value of the people in the class, saying, “But being at that class and seeing that there is a lot of other people besides me that are in basically the same boat, it made me want to get better.” One participant highlighted the use of action planning, mastery experiences, and the importance of the peer supports when she said, “It was embarrassing when you come in and they ask you-if you hadn’t done it (completed action plan/goal by next week).” Participant 24 referenced the importance of social modeling and seeing others like me: “When I see all the other things that people talked about in that class, I just say, ‘wow, if they can handle it, then I can do it’.” “Like me” did not mean the same condition or even age, rather “like me” meant people with conditions who were actively doing some aspect or process of self-management.

Emerging Conceptual Category Believing I can do…

The overarching conceptual category, Believing I can do..., eventually emerged to begin to explain the participants’ views on SE and CDSMP. Although participants were asked specifically about
SEMCD and Fall-related SE, answers often reflected more general workshop applications about managing general health rather than managing conditions or falls. SE to manage health emerged as a larger and broader understanding of CDSMP impact on SE. It was participants’ blended experiences and responses which evolved into the conceptual category of *Believing I can do*. CDSMP fostered a general sense of confidence to manage anything and that the act of managing (often represented by *Doing codes*) helped to further build a variety of types of confidence.

Participant 23 explained “I just believe that I can attempt anything for myself if I have to. You know if I don’t have anybody there, then I do the best I can.” She was discussing her choice of diet, getting up earlier in the morning, and adjusting her schedule if her diverticulitis flared. As the discussion continued, the interaction between the press of the condition (needing to quickly use the bathroom and being in discomfort) and the risk of falling by rushing to the bathroom could be easily seen. It was not just that she had confidence to manage her condition or to manage falls by not rushing but rather the sense of confidence involved with being able to do all of it at the same time. This general sense of health management was also seen in the subcategory of *increasing confidence* when participants talked about managing something giving them confidence. These participants had a broader confidence about managing their own health that was different though related to SEMCD and Fall-related SE. Figure 4.2 represents the conceptual understanding of SE to manage health fit within other types of SE. The figure also shows possible influences of CDSMP on types of SE and skills.

**Discussion**

This study explored the impact of the CDSMP participation on older adult perceptions of self-efficacy for managing of conditions (SEMCD) as well as Fall-related SE. Prior research and theory established the importance of facilitating SE in health promotion (Bandura, 2004). SE levels (existing or as a result of intervention) are associated with other positive health outcomes (Lorig, Sobel, et al., 2001). For older adults, falls and chronic disease share an intimate and potentially deadly connection that worsens with age but most especially with frailty (Lahousse et al., 2014). Participants viewed SEMCD and Fall-related SE as inter-related aspects of SE. Participant discussions and analytic aspects of coding
led to a larger, additional concept of health self-management coded within the conceptual category as *Believing I can do*. This was not limited to isolated aspects of SEMCD and Fall-related SE.

The CDSMP workshop is designed to address management of general conditions rather than a single condition such as diabetes (Ory, Ahn, et al., 2013) and recent publications regarding the *National Study of CDSMP* have broadened language to emphasize “better health” (Ory, Smith, et al., 2013) rather than manage conditions. The older adults interviewed did not view the increased competence gained from CDSMP participation in planning actions and learning new skills as relegated to only one type of self-efficacy.

Phase one quantitative data and analysis identified SEMCD and Fall-related SE as related but distinct concepts that changed differently over the workshop of the participation of the 6 week CDSMP workshop. Lack of significant changes in SEMCD baseline to post participation could be a reflection that in many cases those attending the workshop were already actively engaged in managing their conditions and their health; for example, all but one of the interviewed participants were already using some system of support for managing the aging process such as attending classes regularly, attending senior centers, and/or living in environments with some aspect of service coordination. Those interviewed saw themselves as already actively engaged in managing their conditions and health prior to starting the workshop which in part led to the metacategory *Reinforcing what I know*.

The demographics for Phase 1 and Phase 2 participants were older with higher number of conditions than the average 65 and over participants in recent studies (Ory et al., 2014). In a recent analysis of SEMCD across six studies (Ritter & Lorig, 2014) where results were not grouped by age, the reported baseline SEMCD Scale mean was 5.44 which was considerably lower than the baseline SEMCD Scale mean of 7.46 reported in this current research. The participants recruited for this current research were then somewhat different from larger national studies. As noted in earlier Phase 1 research (Graham, 2016b), there possibly was already a ceiling effect in place for the SEMCD Scale due to higher scores and therefore less room to change. Interview participants in Phase 2 had an overall mean post minus baseline negative difference indicating decreased SEMCD similar to the larger Phase 2 total group. Despite this
reduction in reported SEMCD on the scale, during the interviews, changes in SEMCD following CDSMP for the interview participants were viewed as either positive or positively applied (becoming more aware) to self-management.

Historically, CDSMP has not emphasized nor measured fall-related variables such as the improved post-workshop changes to Fall-related SE noted in Phase 1. The Phase 1 research of this mixed method study (Graham, 2016b) was the first known research investigating possible changes in Fall-related SE following CDSMP participation. Participants themselves may not have made any connection directly to fall management/prevention and SE during workshop participation until asked about it in the Phase 2 interview. The concept of Fall-related SE was often difficult for the interview participants to describe even through examples. Several participants articulated benefits of the workshop specifically in relation to Fall-related SE such as becoming more aware and being careful. As this was an unexplored area within CDSMP research, these initial findings warrant further exploration about the impact of CDSMP on Fall-related SE and other fall-related outcomes.

Phase 2 interview analysis explored changes in self-efficacy from the participants’ perspectives especially belief in one’s own ability to manage and prevent falls. The interviews helped address limitations with scale data collection by going in depth to the participants. For example, the Phase 1 scales were completed with no knowledge of their original scores, and individual scale scores often varied from interviewee perspectives reported during the interviews. The interviews better captured co-occurring experiences such as sudden changes in health or a near fall experience that participants cited as reasons for changes in either type of SE.

Throughout the conversations with the older adults, there were aspects of the workshop content that fit together with Fall-related SE and SEMCD. Course content and structure such as action planning, having social support, and reviewing what they already know emerged as related methods to address both Fall-related SE and SEMCD. Through processes such as planning actions, learning new things, doing more and doing better, these older adults developed increasing competence (to manage health as well as manage conditions and falls). Participants reported an ongoing process of becoming aware of the benefits
of doing, developing competence, and self-reflection as a result of participation in CDSMP. These processes combined with seeing others like them, helped to create a larger sense of belief in their ability to manage. The belief in one’s ability to manage general aspects of health can be defined as SE to manage health. Thus, health self-management emerged as a related, but broader process of management compared to managing disease(s) or falls.

Phases 1 and 2 of this research each supported the distinctiveness yet relatedness of SEMCD and Fall-related SE. These relationships between SEMCD and Fall-related SE should be further considered and explored especially as they relate to the broader SE to manage health identified in this research. Figure 4.2 represents a proposed structure of efficacy relationships that developed from interviews and subsequent coding and analysis. From the interview analysis, there were a set of shared skills and experiences taught in CDSMP such as action planning that seemed to generalize or be seen as inter-related to fall management. According to Bandura, SE should be considered task specific, but SE can generalize in terms of similarity of subskills, generalizable self-regulatory skills and even through making connections cognitive between activities (1997). This can be applied to the current research in two main ways. First, mastery experiences from managing conditions were similar in skill sets (like action planning) to managing falls. These skills could have generalized to develop competence to manage falls and thus increased the Fall-related SE that was documented in both phases of this study. Another possible process arising from the research might be that successful management experiences surrounding one’s health had a transfer or overflow effect influencing the related-yet-different Fall-related SE. In this case, the “generalizable self-regulatory skills” described by Bandura (1997, p. 53) are more than just general skills, they are the broader skills of managing one’s health. From the participants’ experiences SE to manage health influenced both SEMCD and Fall-related SE. Finally, Bandura cautions against generalized SE that loses meaning and application as it becomes broader. For these participants, SE to manage health was seen as a specific type of SE set within self-management skills that seem to be broader in scope than other types of self-management.
Assessing quality and rigor

Tashakkori and Teddlie (2008) recommended that a mixed methods study should have design quality and interpretive rigor for inferences. This sequential design’s purposes of complementarity and development facilitated integrative aspects of mixing throughout the study; however, the sequential nature of the design, did present several challenges. First, as a sequential, integrated design, the parallel processes associated with formal triangulation could not be used. The multiple methods did permit rich understanding of self-efficacy associated with complementarity purposes such as using different methods –scales and interviews to measure SE (Greene, 2007; Greene et al., 1989). It also provided a comparison between the types of ways to address self-efficacy, via scale and interviews. The developmental purpose (using the scale data first to inform the interview guide) delayed the time before interviews could began due to multiple phases; however, the longer length of time did permit gathering rich data. Despite these issues, the study design promoted collection and integration of findings that provided the “optimal action that produces consequences for a line of inquiry” according to Morgan (2014).

In terms of interpretive rigor (interpretive consistency, theoretical consistency, interpretive agreement, interpretive distinctiveness, and integrative efficacy), this study sought to stay within the scope of the research. The Fall-related SE changes following program participation held significance regardless of outliers removed (or retained); however the non-normal data as well as the small “n” did limit the analysis that could be performed. For more limitations regarding the Phase 1 analysis, please see Graham (2016a, 2016b). Despite its limitations, the quantitative scale data provided a method of interaction within the field of health promotion that is a more accepted view of self-efficacy. Inferences from this study maintained theoretically consistency with Bandura’s self-efficacy theory (1997). The use of the constant comparative method (Charmaz, 2014), the strengths of NVIVO software facilitated close access to original data even when coding and transforming data sources (Bazeley, 2010). In terms of integrative efficacy, bringing and integrating the quantitative data within the final analysis strengthened the analysis process. In addition, expert review and feedback during the coding process strengthened the
interpretive agreement. Member checking and constant reflective memoing also added to the integrity of
the research.

**Conclusion**

Aging adults often must deal with the direct and indirect effects of chronic conditions that can
influence risk of falls (Lawlor, Patel, & Ebrahim, 2003). By managing their conditions such as through
CDSMP, older adults are at least indirectly managing fall risk. Successful management builds SE (Lorig
& Holman, 2003). Although CDSMP outcomes for managing conditions and improving health are well
documented (Ory, Ahn, Jiang, Lorig, et al, 2013), possible impact on Fall-related SE remains
underexplored. Possible interconnections between CDSMP and Fall-related SE are supported by several
assertions from this research. First, significant changes in Fall-related SE noted in Phase 1 warrant
further exploration in relation to CDSMP. Second, the inter-relationships between the scale data and
interviews point to common ground between SEMCD and Fall-related SE. This could be conceptualized
as similar subskills generalizing from SEMCD to Fall-related SE; however, the analysis suggests a
broader type of SE, that of SE to manage health. These inferences highlight possible broadening of
CDSMP application beyond managing conditions and into managing health. Practitioners and researchers
working with older adults should consider aspects of self-management to include managing conditions
and managing falls (Beattie, 2015). Managing health and promoting SE to manage health should also be
considered. Further exploration of these concepts will help clarify the processes involved in self-
management and what types of shared skills and tasks might be better represented by self-management of
health.

**References**

chronic disease self-management programs: Healthcare savings through a community-based


Unpublished manuscript, School of Occupational Therapy, Brenau University


Table 4.1.

Recruitment and Participation into Phase 1 and Phase 2

<table>
<thead>
<tr>
<th>Recruitment into Study</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of adults enrolled in participating CDSMP completing 4 of 6 session (out of 86)</td>
<td>63</td>
<td>73.26</td>
</tr>
<tr>
<td>Number of initial participants enrolled in study</td>
<td>53</td>
<td>100</td>
</tr>
<tr>
<td>Number of participants dropped due failure to complete 4 of 6 sessions</td>
<td>7</td>
<td>13.2</td>
</tr>
<tr>
<td>Number of participants dropped due failure to complete baseline and post scales</td>
<td>2</td>
<td>3.8</td>
</tr>
<tr>
<td>Number of participants dropped due to cancelled class</td>
<td>3</td>
<td>5.7</td>
</tr>
<tr>
<td>Missing question on SEMCD Scale or FallE Scale</td>
<td>5</td>
<td>9.4</td>
</tr>
<tr>
<td>Final number of participants included- Phase 1</td>
<td>36</td>
<td>67.9</td>
</tr>
<tr>
<td>Final number of participants included- phase 2-interviews</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.2.

Participant Baseline Characteristics for Consenting Participants and Those Included in Phase 1 and Phase 2

<table>
<thead>
<tr>
<th></th>
<th>Consented to at least Phase 1</th>
<th>Used in analysis-Phase 1</th>
<th>Consented but not included in analysis&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Used in analysis Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (±SD)</td>
<td>Mean (±SD)</td>
<td>Mean (±SD)</td>
<td>Mean (±SD)</td>
</tr>
<tr>
<td>Age in years</td>
<td>74.45(±9.64)</td>
<td>72.19(±8.19)</td>
<td>76.27(±11.74)</td>
<td>76.27 (±6.54)</td>
</tr>
<tr>
<td>Number of conditions reported per person</td>
<td>3.95(±2.43)</td>
<td>3.63(±2.5)</td>
<td>4.36(±2.0)</td>
<td>4.33 (±2.63)</td>
</tr>
<tr>
<td>Number of sessions attended per person</td>
<td>4.65(±1.55)</td>
<td>5.31(±7.49)</td>
<td>3.31(±1.89)</td>
<td>5.33 (±7.24)</td>
</tr>
<tr>
<td>N varies with # responses</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Age Frequencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;65</td>
<td>8(19.0)</td>
<td>7(20.5)</td>
<td>2(18)</td>
<td>N/A</td>
</tr>
<tr>
<td>≥65</td>
<td>34(81.0)</td>
<td>27(79.4)</td>
<td>9(82)</td>
<td>15 (100)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>41(78.8)</td>
<td>28(77.8)</td>
<td>13(81.3)</td>
<td>11(73.3)</td>
</tr>
<tr>
<td>Male</td>
<td>11(21.1)</td>
<td>8(22.2)</td>
<td>3(18.8)</td>
<td>4 (26.7)</td>
</tr>
<tr>
<td>Race/ethnicity (participants could mark more than one)</td>
<td>N=44</td>
<td>N=35</td>
<td>N=12</td>
<td>N=15</td>
</tr>
<tr>
<td>White</td>
<td>33(75.0)</td>
<td>27(75)</td>
<td>8(66.7)</td>
<td>11 (73.3)</td>
</tr>
<tr>
<td>African American</td>
<td>13(29.5)</td>
<td>9(25)</td>
<td>5(41.7)</td>
<td>4 (26.7)</td>
</tr>
<tr>
<td>American Indian</td>
<td>4(7.5)</td>
<td>4(8.3)</td>
<td>1(8.3)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>Asian</td>
<td>2(4.5)</td>
<td>2(2.8)</td>
<td>1(8.3)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>Education</td>
<td>N=41</td>
<td>N=33</td>
<td>N=11</td>
<td>N=15</td>
</tr>
<tr>
<td>Some elementary to high school</td>
<td>4(9.8)</td>
<td>2(6.06)</td>
<td>2(18.2)</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>High school graduate or GED</td>
<td>10(24.4)</td>
<td>10(30.30)</td>
<td>0(0.0)</td>
<td>7 (46.7)</td>
</tr>
<tr>
<td>Some college or technical school</td>
<td>17(41.5)</td>
<td>11(33.33)</td>
<td>7(63.6)</td>
<td>2 (13.3)</td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>10(24.4)</td>
<td>10(30.30)</td>
<td>2(18.2)</td>
<td>5 (33.3)</td>
</tr>
<tr>
<td>Chronic conditions</td>
<td>N=43</td>
<td>N=35</td>
<td>N=11</td>
<td>N=15</td>
</tr>
<tr>
<td>Alzheimer’s/Dementia</td>
<td>1(2.3)</td>
<td>1(2.9)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>Osteoarthritis/Rheumatoid arthritis</td>
<td>22(51.2)</td>
<td>15(42.9)</td>
<td>8(72.7)</td>
<td>7 (46.7)</td>
</tr>
<tr>
<td>Breathing/Lung</td>
<td>12(27.9)</td>
<td>11(31.4)</td>
<td>1(9.1)</td>
<td>7 (46.7)</td>
</tr>
<tr>
<td>Cancer</td>
<td>3(7.0)</td>
<td>3(8.6)</td>
<td>0(0.0)</td>
<td>2 (13.2)</td>
</tr>
<tr>
<td>Chronic pain</td>
<td>11(25.6)</td>
<td>7(20)</td>
<td>5(45.5)</td>
<td>3 (20.0)</td>
</tr>
</tbody>
</table>

(continued)
## Conditions continued:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Consented to at least Phase 1</th>
<th>Used in analysis-Phase 1</th>
<th>Consented but not included in analysis*</th>
<th>Used in analysis Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression/Anxiety</td>
<td>10(23.3)</td>
<td>10(28.5)</td>
<td>1(9.1)</td>
<td>3 (20.0)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>19(44.2)</td>
<td>13(37.1)</td>
<td>7(63.6)</td>
<td>7 (46.7)</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>8(18.6)</td>
<td>6(17.1)</td>
<td>2(18.2)</td>
<td>4 (26.7)</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>20(46.5)</td>
<td>15(42.9)</td>
<td>6(54.5)</td>
<td>7 (46.7)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>21(48.8)</td>
<td>16(45.7)</td>
<td>7(63.6)</td>
<td>7 (46.7)</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>6(14)</td>
<td>5(14.3)</td>
<td>1(9.1)</td>
<td>2 (13.3)</td>
</tr>
<tr>
<td>Stroke</td>
<td>4(9.3)</td>
<td>2(5.7)</td>
<td>3(27.3)</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Other conditions</td>
<td>19(44.2)</td>
<td>14(38.9)</td>
<td>4(36.4)</td>
<td>10 (66.7)</td>
</tr>
</tbody>
</table>

Note. Numbers vary due to incomplete demographic data. *Total possible who consented but were not included in analysis is N=16. This includes 7 who did not complete 4+ of 6 sessions; 6 with incomplete or missing scales; 3 who consented and workshop was cancelled.
Table 4.3.

*Spearman’s Rho Correlations for SEMCD and FallE Scales at Baseline and Post Participation in CDSMP for Phase 2 Interview Participants (N=15)*

<table>
<thead>
<tr>
<th>Correlation</th>
<th>r</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline and post SEMCD Scales</td>
<td>.756**</td>
<td>.001</td>
</tr>
<tr>
<td>Baseline SEMCD and baseline FallE Scales</td>
<td>.655**</td>
<td>.008</td>
</tr>
<tr>
<td>Baseline SEMCD and post FallE Scales</td>
<td>.567*</td>
<td>.028</td>
</tr>
<tr>
<td>Post SEMCD and baseline FallE Scales</td>
<td>.549*</td>
<td>.034</td>
</tr>
<tr>
<td>Post SEMCD and post FallE Scales</td>
<td>.682**</td>
<td>.005</td>
</tr>
<tr>
<td>Baseline and post FallE Scale</td>
<td>.862***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Difference post-baseline Fall E Scale and difference post-baseline SEMCD Scale</td>
<td>.510</td>
<td>.052</td>
</tr>
</tbody>
</table>

Note. 2-tailed significance.
*P<0.05, **P<0.01, ***P<0.001
Table 4.4.

*Wilcoxon Signed Rank Tests for SEMCD Scale and Fall E Scale Scores Post-Intervention Minus Baseline in CDSMP Workshop for Phase 2 Interview Participants (n=15)*

<table>
<thead>
<tr>
<th>SEMCD Scale Items (confidence to…)</th>
<th>Baseline Mean</th>
<th>Post Mean</th>
<th>Baseline Median</th>
<th>Post Median</th>
<th>Positive Test</th>
<th>Neutral</th>
<th>Negative Test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Keep fatigue from interfering with the things you want to do?</td>
<td>7.20</td>
<td>6.73</td>
<td>7</td>
<td>7</td>
<td>2</td>
<td>9</td>
<td>4</td>
<td>-0.954</td>
</tr>
<tr>
<td>2. Keep pain/physical discomfort from interfering with the things you want to do?</td>
<td>7.33</td>
<td>7.27</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>0.000</td>
</tr>
<tr>
<td>3. Keep emotional distress from interfering with the things you want to do?</td>
<td>7.60</td>
<td>8.13</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>1.345</td>
</tr>
<tr>
<td>4. Keep other symptoms from interfering with the things you want to do?</td>
<td>7.00</td>
<td>7.43</td>
<td>7</td>
<td>7.5</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>1.268</td>
</tr>
<tr>
<td>5. Do the different task and activities needed to manage so as to reduce your need to see a doctor?</td>
<td>7.40</td>
<td>7.07</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>-0.765</td>
</tr>
<tr>
<td>6. Do things other than just taking medications to reduce how much your illness affects your everyday life?</td>
<td>8.20</td>
<td>7.87</td>
<td>7</td>
<td>7</td>
<td>2</td>
<td>9</td>
<td>4</td>
<td>-0.738</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SEMCD Scale (possible scores from 0 to 10)</th>
<th>Baseline Mean</th>
<th>Post Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.46</td>
<td>7.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FallE Scale Items (how sure are you that you can…)</th>
<th>Baseline Mean</th>
<th>Post Mean</th>
<th>Baseline Median</th>
<th>Post Median</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
<th>test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Find a way to get up if you fall</td>
<td>2.53</td>
<td>2.80</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>1</td>
<td>1.414</td>
<td>.157</td>
</tr>
<tr>
<td>2. Find a way to reduce falls</td>
<td>2.87</td>
<td>3.27</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>1.667</td>
<td>.096</td>
</tr>
<tr>
<td>3. Protect yourself if you fall</td>
<td>2.80</td>
<td>2.47</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>1.508</td>
<td>.132</td>
</tr>
<tr>
<td>4. Increase your physical strength</td>
<td>2.93</td>
<td>2.87</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>-0.333</td>
<td>.739</td>
</tr>
<tr>
<td>5. Become more steady on your feet</td>
<td>2.93</td>
<td>2.67</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>-1.027</td>
<td>.305</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FallE Scale (possible scores from 1 to 4)</th>
<th>Baseline Mean</th>
<th>Post Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14.07</td>
<td>14.07</td>
</tr>
</tbody>
</table>

2-sided $P$ value, asymptotic
Table 4.5

*Summaries of Categories and Definitions for CDSMP Impact on Participants’ SE and Self-Management*

<table>
<thead>
<tr>
<th>Metacategory: Reinforcing what I know</th>
<th>Course just reinforced what already knew about skill or topic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metacategory: Giving me more</td>
<td>Not specific to one type of management or SE but specific gains as a result of CDSMP participation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Categories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing confidence</td>
<td>Confidence includes SEMCD, Fall-related SE and possible SE to manage health (proposed), may include positive or negative changes.</td>
</tr>
<tr>
<td></td>
<td>Specific methods gained from course participation that impacted <em>Doing</em> or ability to self-manage health, a specific condition, and/or falls. All coding references positive in relation to course influence.</td>
</tr>
<tr>
<td>Changing competence</td>
<td>As a result of course participation, increased awareness and insight into aspects of self-management and SE.</td>
</tr>
<tr>
<td>Becoming more aware</td>
<td>Course impact related to importance of social support and social modelling.</td>
</tr>
<tr>
<td>Seeing others like me</td>
<td></td>
</tr>
</tbody>
</table>

Note. CDSMP = Chronic Disease Self-Management Program; SE = Self-Efficacy; SEMCD = Self-efficacy to manage chronic conditions(s); Fall-related SE = Fall-related self-efficacy.
Figure 4.1. Visual representation of CDSMP participation: metacategories and categories. Metacategories: Giving me more and Reinforcing what I know, following CDSMP participation. Changing confidence, Changing competence, Becoming aware, and Seeing others like me are categories that emerged out of the data. CDSMP = Chronic Disease Self-Management Program.
Figure 4.2 Proposed structure of efficacy relationships. Figure provides a potential visual summary of efficacy relationships in terms of CDSMP, managing health, managing conditions, and managing falls. CDSMP = Chronic Disease Self-Management Program; SE = Self-Efficacy; SEMCD = Self-efficacy to manage chronic conditions(s); Fall-related SE = Fall-related self-efficacy.
CHAPTER 5
SUMMARY AND CONCLUSIONS

Introduction

As Americans age, the risk of chronic disease, functional deficits, and financial costs associated with chronic disease rise dramatically. Both age and chronic disease are associated with increasing incidence of falls, injury due to falls, and decreased functional status (Lawlor, Patel, & Ebrahim, 2003). Stanford’s Chronic disease self-management program (CDSMP) and fall prevention programs (FPP) share similar generalized content (environmental safety, safe medication use, diet, and the importance of exercise, goal setting) (Davis, Marra, & Liu-Ambrose, 2011; Smith, Jiang, & Ory, 2012; Stevens, Noonan, & Rubenstein, 2010). The most recent standardized manual for CDSMP has also added a short segment on fall prevention (Lorig, Gonzalez, & Laurent, 2012).

Self-efficacy or the perceived confidence in the ability to do a task such as to manage conditions (SEMCD) or to manage and prevent falls (Fall-related SE) has been included in many health promotion theories and programs (Bandura, 2004). Self-management programs often use specific types of self-efficacy (SE) as key content constructs and variables (Arnold & Faulkner, 2009; Lorig & Holman, 2003). Self-efficacy is typically measured via task specific quantitative scales based on task specific programs (Bandura, 1997; Lorig & Holman, 2003). The Self Efficacy to Manage Chronic Disease Scale (SEMCD Scale) is typically used to measure SE to manage conditions in CDSMP (Ritter & Lorig, 2014). The FPP A Matter of Balance/ Volunteer Lay Leader (AMOB/VLL) typically uses the Fall Efficacy Scale (FallE Scale) to measure a person’s confidence to manage and prevent falls (Smith et al., 2012). While researchers have explored different cultural and disease applications of CDSMP with successful outcomes (Lorig, Ritter, & Jacquez, 2005; Lorig, Ritter, & Plant, 2005), no known research has yet extended CDSMP research to explore possible applications to Fall-related SE.
Using a sequential mixed method design, this investigated older adults’ perceptions relating to changes in SE to manage disease and to prevent falls following participation in CDSMP. See Figure 5.1 for diagram of design and analysis in the two phases. The quantitative scales (SEMCD Scale and FallE Scale) provided developmental information for the qualitative exploration of perceptions of CDSMP impact on SE to manage conditions and falls. In addition, the scale data was used in a complementary and integrative fashion during analysis to add depth to understanding about relationships between managing conditions and falls as well as types of SE.

Chapter Summaries

Chapter 3. Exploring Fall Self-Efficacy Outcomes Following Participation in a Chronic Disease Self-Management Program

Manuscript 1 summarized the first methodological phase of this dissertation research designed to determine relationships between SEMCD and Fall-related SE and whether changes in SE were noted following participation in CDSMP. The two primary measures reported in this manuscript, the SEMCD Scale and the FallE Scale were chosen due to their common and reliable use in EBP to measure changes in specific types of SE (Ritter & Lorig, 2014; Smith et al., 2012). Related course content between the CDMSP and FPP such as AMOB as well as overlapping target population (older adults with chronic disease) warranted this initial research focus. Most of the research and programming has described EPB programs for managing conditions and FPP as complimentary such as seen in the recent Frontiers Research Topics issue dedicated to EBP in disease management and fall prevention (Ory & Smith, 2015). This dissertation research explored possible intersections between Fall-related SE in relation to the generalized self-management content in the CDSMP.

Initial site locations as well as duration of data collection were extended to recruit more participants. Following a 10-month data collection period, 53 CDSMP participants out of a possible 89 enrolled in CDSMP consented to participate in the study. Of those consenting, 36 people had complete scale information and were included in this analysis, mean age 72.79(±8.19). Baseline and post CDMSP participation data was collected for the SEMCD Scale and FallE Scale. Although data did not meet Q-Q
plot criteria for normality, data was generally evenly distributed and therefore less susceptible to outliers. Since the sample was >30 and given that t-tests are more resilient to issues with normality, approximate normal sampling distribution was assumed (Field, 2009). Principal component analysis using oblique rotation identified single components for each individual scale and only two components with no double loadings >4 when scales were placed together at both baseline and post collection points. Reliability was adequate for both scales at both time points. This PCA and reliability analyses supported prior research (Cho et al., 2015; Ritter & Lorig, 2014) regarding reliability of the scales as well as added justification for the scales being distinct and measuring two different types of SE.

The scores from the scales were correlated with each other at both baseline and post time periods. Non-parametric testing completed in response to lack of normal data was significant for the proportion of participants who changed positively only for the Fall-related SE scale from baseline to post-intervention. Only the FallE Scale showed significant change in mean scores for the paired two-tailed t-tests performed for mean differences post CDSMP participation minus baseline. This result was interesting since the FallE Scale was developed specifically to measure efficacy to manage falls for the AMOB/VLL fall management and prevention EBP. In summary, Phase 1 participants were significantly different in the proportion of people changed and the magnitude of change from baseline to post-intervention for FallE Scale.

Chapter 4. A Mixed Method Approach to Understanding the Impact of Older Adult CDSMP Participation on Self-Efficacies to Manage Falls and Chronic Disease

Older adults face increased risk of falls and chronic disease (Hung, Ross, Boockvar, & Siu, 2011; West, Cole, Goodkind, & He, 2014). CDSMP now includes a short 10-minute session on fall prevention and management as part of one of the six, 2.5 hour sessions in this standardized program (Lorig et al., 2012). Self-efficacy was chosen as a primary focus as it has been shown to be predictive of future health status as well as frequently utilized as a key component and measure of program outcomes for both CDSMP and FPP programs such as AMOB/VLL (Lorig, Ritter, et al., 2001; Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001; Smith et al., 2012). As an exploratory study regarding Fall-related SE and
CDSMP, the mixed methods approach captured different aspects of understanding from older adults who had participated in the program. The use of a pragmatic stance enabled the use of both quantitative and qualitative perspectives. Thirty-six consenting CDSMP participants with complete scale information were used in Phase 1 (Chapter 3, Manuscript 1 in this dissertation), and the results were incorporated into this study. Fifteen of the CDMSP participants who were 65 and older consented to interviews and had met Phase 1 qualifications (4+ of 6 sessions, completion of baseline and post scales) and were recruited for semi-structured interviews. Priority recruitment was given to minorities and males though the sample remained mostly white females. Mean age was 72.79 with 7 (20.5%) participants below the age of 65 in Phase 1 while Phase 2 had a mean age of 76.24 (participants were 65 and older in this interview group).

The sequential design gathered early quantitative (Phase 1) initial baseline and post-intervention self-efficacy scale scores reported in Manuscript 1 (for disease management and Fall-related SE) and used the analysis to develop and refine the interview guide to reflect emerging relationships with Fall-related SE and SEMCD. In addition, Phase 1 individual scores helped determine direction of questions for each participant during the Phase 2 interviews to better explore these older adults’ understanding of self-efficacy and participation in the Chronic Disease Self-management Program (CDSMP). The scale scores were also used in a complementary fashion to describe changes in SE following CDSMP participation during the final analysis. Recorded interviews were transcribed and then coded using process, gerund-based coding to capture actions. Focused codes and categories were developed through the constant comparative method. In addition, structural coding according to question and type of SE was also completed. NVIVO software was used to help organize and sort the data. Phase 1 data was incorporated into analysis as well by linking it with participant responses as codes for the interview participants when applicable.

Main conceptual coding related to SE was identified as Believing I can do.... Metacategories included: Giving Me More and Reinforcing What I Know. The categories of Changing confidence, Changing competence, Seeing others like me and Becoming more aware contributed to the metacategory Giving Me More. Refer to Figure 4.1 for a visual representation of the metacategories and categories.
Initial preconceived differences and structural coding based on specific type of SE were not prioritized in the final analysis. A third type of SE emerged defined as *SE to manage overall health*. This type of SE was inter-related with CDSMP, SEMCD, and Fall-related SE. It was also distinct from the other types of self-efficacies. Figure 4.2 depicts proposed SE relationships and structure in relation to self-management and CDSMP.

**Discussion of Relevance to Overall Dissertation**

**Initial Research Questions**

This dissertation addressed a gap in the literature regarding application of CDSMP and possible applications to Fall-related SE and other fall-related outcomes. This research provided an exploratory approach to consider inter-relationships between three important aspects of promotion of health and self-management: chronic disease prevention, fall prevention, and self-efficacy. Using a sequential, mixed-methods methodology, the dissertation addressed the following research questions:

- How are the concepts of self-efficacy to manage chronic conditions (SEMCD) and self-efficacy to manage/prevent falls (Fall-related SE) related before and after participation in a self-management program? (primarily quantitative-Chapter 3/Manuscript 1)
- How does participation in a self-management program impact older adult perceptions of self-efficacy to manage or prevent falls (Fall-related SE) as compared to their perceptions self-efficacy to manage chronic conditions? (mixed-Chapter 4/Manuscript 2)
- How do older adult participants understand relationships between self-efficacy to manage chronic conditions (SEMCD) and self-efficacy to manage/prevent falls (Fall-related SE) following participation in a self-management program? (mixed-Chapter 4/Manuscript 2 and an additional manuscript in the early stage of development)

**Chapter 3-Manuscript 1**

Manuscript 1 directly addressed the first research question: How are the concepts of self-efficacy to manage chronic conditions (SEMCD) and self-efficacy to manage/prevent falls (Fall-related SE) related before and after participation in a self-management program? This was Phase 1 of the overall
dissertation mixed method study. This paper provided initial analysis and established several key assertions that then guided Phase 2. First, PCA analysis of each scale confirmed prior research as well as Bandura’s SE theory as each scale loaded on a single component whether at baseline or post. In addition, when entered together the scales still loaded on separate components. The factor structure supported that the SEMCD Scale and the FallE Scale were different constructs for these participants. A second assertion follows based on the strong correlations between scales at either data collection point. The scales uniquely measured different types of SE but these types of SE were related. The significant difference in means found only for Fall-related SE was somewhat surprising in that SEMCD did not change significantly-in fact it went down slightly overall. One possible explanation is that the mean scores on the SEMCD were already skewed toward the high end of the scale so these scores would be less likely to see big effects. The significant findings for mean difference as well as the significant difference in the number of people who positively changed from baselines for Fall-related SE provided initial support and focus for the overall research question and Phase 2 of the study.

Chapter 4-Manuscript 2

This manuscript addressed the second research question from the dissertation directly as well as part of the third research question. The manuscript fully addressed the second research question: How does participation in a self-management program impact older adult perceptions of self-efficacy to manage or prevent falls (Fall-related SE) as compared to their perceptions of self-efficacy to manage chronic conditions? The analysis of the data used to address this question required a pragmatic stance to proceed in a rather unusual direction developmentally by using the quantitative analysis to inform the prioritized qualitative interview data in order to gather depth of understanding about this unexplored issue. The developmental use of the data that was analyzed in the first manuscript (Phase 1) informed and directed the interview guide and questions. Participants understood the impact of CDSMP on SE and on self-management through the Metacategories: Giving Me More and Reinforcing What I Know. Although separating the types of SE during the analysis became less important, a distinction did emerge in terms of self-management that led into the third research question. Initially in wording and concept, self-
management of health and self-management of conditions was used interchangeably by the researcher. But, through the course of the analysis, this concept emerged as something other—a broader type of self-management and corresponding SE that was neither fall nor condition specific. Many of the key skills and knowledge taught in CDSMP would seem to reside more within this aspect of self-management of health rather than specifically within managing conditions or managing falls.

**Methodological and Conceptual Concerns**

**Methodological Concerns**

Although researchers agree that quality should address the quantitative and qualitative aspects of a study as well as the portions that are mixed, (Onwuegbuzie & Johnson, 2006; Tashakkori & Teddlie, 2008), mixed methods does not have one agreed method to assess the quality of the study because of the dual-sometimes opposing types of research included. This dissertation used the quality standards put forward by Tashakkori and Teddlie (2008) in their integrative framework to assess quality in mixed methods. This framework assisted in assessing the quality of conclusions and meta-inferences (integrated inferences) arising from this research. According to their framework, researchers should attend to standards to evaluate methodology (known as design quality) which include: suitability of design for research questions; adequate data collection methods; design consistency where the components fit; and analytic adequacy where the choice of analysis fits the research questions.

**Design Quality.** In this study, the design purposes (development and complementarity) and design structure (sequential where quantitative was used to develop prioritized qualitative method) created a methodology that effectively addressed the research questions with consistency. The design choices of methods supported each other in terms of weaknesses and strengths (Morgan, 2014; Tashakkori & Teddlie, 2008). The scale data provided a point of departure, a developmental purpose, for the priority Phase 2 interviews (Morgan, 2014). This use of the quantitative scale data provided a method of interaction within the field of health promotion as it is a more accepted view of self-efficacy. The interviews and subsequent analysis added depth and richness not possible if reliant only on scale data.
The CDSMP is a manualized program that uses standardized text and content which ensured fidelity within program administration despite data being collected from a variety of areas. Use of scripts for reference during data collection of scale data helped to ensure quality data collection methods. In addition, the Phase 1 data collection methods used well-researched scale measures with good internal consistency and good relation to outcomes. Qualitative interviews provided design adequacy by providing a deeper, less structured route to access individual meaning and interactions regarding self-management, self-efficacy, chronic disease, and falls. In addition, verbatim transcription of recorded interviews and member checking for accuracy ensured design adequacy.

Recruitment was hampered by ongoing difficulty to recruit adults into CDSMP as well as by the limited program offerings across the state. Purposive, criterion sampling (sampling to achieve a broader group than typically seen in CDSMP) attempted to facilitate sample selection closer to the population distribution for the region for gender, race and ethnicity than typically seen in CDSMP workshops. Despite intentional recruitment among males and minorities who had consented, a more representative sample was not reached. The size of the sample (even after extending recruitment location and duration) presented multiple methodological concerns; however, in terms of analytic adequacy, analysis did not over-reach the limitations of this smaller “n” design. For Phase 1, the n=36 participants with complete baseline and post scales did enable assumptions of approximate normality for sampling distributions for the more resilient t-tests (Field, 2009). Power was sufficient for correlations at .94; however the study was underpowered for the Wilcoxon Signed Rank Test (power at .48 for example for sum difference in FallE Scale) and for the t-tests (power for FallE Scale sum difference at .53). Since data collection did not reach the numbers needed for statistical power on the quantitative Phase 1 portion of the study, no analysis by group was performed. This type of analysis should be performed in any future studies such as by age or number of conditions to expand understanding of Fall-related SE changes. Nonparametric analysis was used as primary methods though parametric analysis confirmed results. Use of Principal Component Analysis confirmed expected results of single components when the scales were entered separately. Placement of both scales within a single analysis as a “metascale” produced two components
which were completely aligned along the respective scale items. This PCA analysis was presented only as an initial, exploration due to low power for number of scale items considered. Experts were also consulted to ensure appropriate statistical analysis methods were used.

This study also addressed design quality through the use of appropriate qualitative and integrated mixed method analysis choices. Analysis of interview data used the constant comparative methodology to develop conceptual categories that helped support final integrative analysis and meta-inferences by moving back and forth between both types of data (scale and interviews). The choice of pragmatic paradigm also fully supported such integration. Expert consultation and revisions assisted with appropriate coding strategies and development of categories and metacategories.

**Interpretative rigor.** Tashakkori and Teddlie (2008) described the evaluation of methods for warranting the quality of inference as *interpretative rigor*. They advocated for assessing interpretive consistency, theoretical consistency, interpretive distinctiveness and integrative efficacy to determine if inferences are credible based on results and other contributing factors. The researcher kept ongoing awareness of the importance in producing inferences that reach beyond a listing of mere quantitative or qualitative. Theoretical consistency was ensured by consistent use of Bandura’s SE theory; it helped guide but did not dictate inferences. The final assertion made in this dissertation, that of an additional type of self-efficacy to manage health, did not contradict this theory but does offer additional points to consider in terms of CDSMP possible applications to Fall-related SE.

Purposes of complementarity and development promoted integrative efficacy by providing ongoing opportunity to integrate the scale data with interview data. The sequential nature of the design presented several challenges. As sequential, integrated design, this dissertation could not use parallel processes associated with formal triangulation. It did however use the multiple methods (scale collection and interviews) to bring richness to understanding more about self-efficacy. It also provided a comparison between scale and interviews methods that uncovered differences in scale data and participant views.
Care was taken not to over-reach or to make unwarranted assertions based on these exploratory findings. By returning to the data during the coding and inference process, this study avoided the limitation associated with interactive data analysis and transforming data beyond recognition. Interpretive agreement was promoted by ongoing consultation with experts from dissertation committee (content experts in gerontology, health promotion, CDSMP as well as mixed methodology expert).

**Recommendations**

**Chapter 3**

Brady, Anderson, and Kobau (2015) discussed *self-management support* as including both CDSMP programming and FPP. The changes noted in Fall-related SE following CDSMP participation in this dissertation’s exploratory research would suggest considering use of an integrated perspective in terms of referrals as well as marketing. If this current finding is supported with further research, CDSMP might consider expanding its outcomes to include fall prevention outcomes. If supported by further research, CDSMP could become an initial route in self-management to preempt falls and decrease what Ganz, Alkema, and Wu (2008) called the chronic state of fall risk so often created by chronic disease. This would require strengthening referral systems and interconnections of public health, medical and aging-related services as advocated by Smith et al. (2015) so as to make programs such as CDSMP part of routine care.

Based on the dissertation results, these older adults’ confidence to manage and prevent falls did change following CDSMP participation. CDSMP may then serve as a potential route to effectively address falls from a broader view of self-management much like it has been shown to have be effective for a variety of diseases. When immediate and specific fall concerns are a priority, direct referral to a FPP should still be made. Although both are effective, clients are often referred to more specific disease-focused programs if one is offered since some research has shown it to be more effective than the broader CDSMP (Lorig, Ritter, & Plant, 2005). Perhaps for general fall prevention and management, CDSMP can generalize in the same way as it does for general conditions.
Chapter 4

Enhancing understanding of self-management. Older adults interviewed during this dissertation identified key aspects of changing confidence and competence, becoming aware and seeing others like me from CDSMP participation that were not specifically tied to one particular type of efficacy. While CDSMP was developed to broadly address self-management of chronic conditions (Lorig, Ritter, et al., 2001; Lorig, Ritter, & Plant, 2005), the emphasis on problem solving, action plans and self-efficacy perhaps facilitates a broader or different focus of self-management of health (and its corresponding SE) rather than the current focus on managing chronic conditions. Participants in this dissertation developed skills (competence) and confidence and awareness that they applied to managing their condition, managing falls (when asked specifically about this aspect) and to managing their health in general. Rather than relegate CDSMP to only those who need to manage their conditions, perhaps the focus of the program can be broadened and marketed as promoting healthy aging through effective self-management of health.

Developing individualized self-management programs. In their article about self-management support, Brady et al. (2015) also described one-on-one support systems in addition to formalized programs as methods to promote self-management. Bandura (2004) noted that people at different levels of SE may need different levels of programming; those persons with low SE and low expectations need more direct opportunities such as CDSMP than perhaps the person with higher SE. Two types of responses to CDSMP emerged from the Phase 2 interview data. One type consisted of participants who felt the program was giving them more (confidence, competence, awareness, and support). The other type expressed that the workshop just reinforced what they knew. The group who felt they were getting more from the workshop might benefit from extended care coordination following the workshop completion. This would work well for those at risk patients such as those who are in an intermediate stage of frailty before the full effects of frailty are experienced (Lahousse et al., 2014). Perhaps at the end of CDSMP, participants could be routinely given the option to access a care coordinator to continue to provide more focused intervention to increase specific mastery experiences in self-management. Bauer,
Implications for Future Research

Chapter 3

This exploratory research presented a first look at the complex relationship between Fall-related SE and SEMCD and changes following CDSMP participation. Since this research was completed using a one way pretest-posttest design with no random sampling or control group/random assignment, future research should try to at least use comparison groups. Both types of SE scales could be administered to larger samples of the older adult population at baseline and post CDSMP intervention. In addition, a six month time measurement should also be used to align more closely with other CDSMP studies that have used SE as outcome variable (Lorig, Ritter et al., 2001; Ritter & Lorig, 2014). A larger sample would more easily detect significant changes in the SE scales and would enable analysis by group such as age and number of chronic conditions across baseline, post-intervention, and post 6 month time points.

Beattie (2015) suggested that “broadening the discussion of effective management of chronic diseases” (p.62) should include fall prevention due to the direct and indirect impact chronic diseases can have on falls. Her opinion article ties nicely into this dissertation. This type of research would allow exploration of the “no wrong door” (p. 267) approach to fall prevention and management advocated by Ganz et al. (2008).

Future research might also explore whether participation in a fall prevention program such as AMOB/VLL might produce significant changes in SEMCD. This would make sense if the changes seen in FallE Scale in this dissertation stemmed from generalization of the broad-based CDSMP workshop content in to Fall-related SE. If that is the case, it would follow that similar content in a FPP would
generalize SE and promote change in SEMCD following participation in a SE-based FPP such as AMOB/VLL.

**Chapter 4 and Beyond**

There is one remaining research question not yet fully explored for this dissertation. A separate analysis of coding and categories will focus on older adults’ perceptions of self-efficacy to manage their health and how this might be different from SEMCD and Fall-related SE. This emerging research will involve continued analysis of interview data as well as integration with Phase 1 quantitative data to enhance understanding of these different aspects of SE as well as related aspects of self-management. As a result of the analysis associated with Chapter 4, self-management of health and related aspects of SE to manage overall health emerged as a broader type of management and efficacy. Figure 4.1 provides a visualization of possible structure of SE to manage health in relation to SEMCD and Fall-related SE and participation in CDSMP.

An additional area of research could address co-completers (those completing both CDSMP and a SE-based FPP such as AMOB/VLL). All but one of the interview participants in Phase 2 were consistently engaged in health promotion classes or contexts beyond participation in a CDSMP workshop. In fact, during the course of the interview, several of the interview participants had already signed up for an upcoming A Matter of Balance program at their facility. It would be fascinating to gather qualitative perspectives perhaps as case studies concerning self-management of health and any changes to types of SE for these individuals who had participated in both programs.

**Conclusions**

This dissertation has applications to both ongoing health education research priorities as well as applied health education for adults, especially older adults engaging in self-management. First, the recent mandates by Congress require health promotion programs for older adults to be evidenced-based (Boutaugh & Lawrence 2015; "Disease Prevention and Health Promotion Services“, OAA Title IIIID). Thus, use of CDSMP as one of the main EBP recommended by Administration on Aging (Administration on Aging -Administration for Community Living) has excellent justification for use in this research. In
addition, current grant initiatives exploring the use of CDSMP and related programs have a priority goal of “implement(ing) innovative funding arrangements to support the proposed programs, while embedding the programs into an integrated, sustainable evidence-based prevention program network” (Administration on Aging - Administration for Community Living). By exploring possible cross-over effects of Fall-related SE into CDSMP, this research helped to identify possible new dissemination opportunities for CDSMP into the realm of fall prevention.

This research also applies to health promotion education directly in that it adds to understanding (though limited due to small, purposive sample) regarding the older adults who engage in self-management classes such as CDSMP. In the interviews, fourteen of the fifteen adults 65 and older reported being actively engaged in multiple methods of self-managing health, disease, and falls beyond CDSMP participation. They regularly took classes such as the CDSMP workshop at their facility or senior center. Despite high baseline SEMCD, they were still seeking ongoing self-management support, and qualitatively reported benefits from CDSMP participation. Understanding these adults’ perspectives on SE, self-management, and CDSMP might help direct educational programming in future.

In addition, those working to get older adults engaged in CDSMP can take the opportunities in zero sessions or post course meetings to make ongoing connections regarding managing health, managing conditions and managing falls and the related types of efficacies. Older adults seeking a FPP that might not be starting for several months could be appropriately referred in the meantime to CDSMP. The older adults interviewed in this research noted that CDSMP built competence and confidence in those overlapping skill and knowledge areas such as problem solving, managing meds and the environment, and communicating with others. For example, competence in setting and reaching goals through the use of action plans was important to these interview participants; reaching goals led to mastery experiences that then supported self-efficacy. Such mastery experiences are foundational to CDSMP (Lorig, Sobel, et al., 2001; ) yet action plan topics are not stipulated by CDSMP leaders. Thus, reaching a goal has an impact beyond the task itself. Perhaps by identifying other possible outcomes such as those related to falls, before CDSMP begins will enhance this generalization process.
In conclusion, the research questions for this dissertation developed from several key overlapping areas of concern: as the boomer population ages, over 20% of the population will be 65 and older by the year 2040, doubling in number since the year 2000 (A Profile of Older Americans: 2014, 2014). Half the population has at least one chronic condition and for the 65 and over population this percentage increases to 85% for at least one condition (Ward, Schiller, & Goodman, 2014). Both the incidence and medical costs of falls increase with age (Stevens, Corso, Finkelstein, & Miller, 2006). Thus, programs that promote managing conditions, managing falls and managing general health are important aspects of healthy aging. CDSMP is a well-researched, EBP (Lorig, Ritter, et al., 2001; Ory et al., 2014) recommended by Administration on Aging (Administration on Aging -Administration for Community Living) to help promote self-management behaviors to manage conditions. SE or the confidence in one’s ability to complete a task (Bandura, 1997), was adopted as a primary theory by CDSMP researchers and for this dissertation. CDSMP uses techniques such as instruction in problem solving and action planning as well as building mastery experiences and using social modeling to promote SE. Course content specific to fall prevention was added to revision to the standardized manual in 2012 (Lorig et al., 2012). Specific sessions of CDSMP include instruction in action planning, fall prevention, improving balance, benefits of exercise, managing medications, effective communications, relaxation, managing pain and fatigue, and healthy eating. CDSMP’s focus on SE, general structure of CDSMP as well as specific course content overlaps with theory, structure, and content of FPP such as AMOB. This led to the research focus on SE, CDSMP, and falls. Up until this dissertation, no research had investigated fall-related measures following CDSMP participation.

The results from Phase 1 presented in chapter 3 showed Fall-related SE increased following CDSMP participation. Small sample size and preliminary nature of findings limit conclusions that can be made or any generalization. Phase 1 did provide direction for the Phase 2 development of questions and interviews with 15 older adults who had successfully completed CDSMP. Analysis using the constant comparative method between interview initial and focused codes into central experiential metacategory of Believing I can in relation to SE to manage conditions, manage and prevent falls, and manage overall
health. By viewing the CDSMP experience in relation to SE, these older adults perceived the course as *Giving me more* and/or *Reinforcing what I know*. Although SE is task specific (Bandura, 1997), a key aspect of this analysis was that participants understood the impact on their SE as not limited to SEMCD or Fall-related SE. Thus, the third type of SE, SE to manage overall health, was suggested as part of the analysis. Much of the coding for *Giving me more* was aligned with developing mastery experiences that promoted efficacy to manage health. Phase 1 data suggest that broader outcomes for CDSMP might need to be further explored especially as it relates to Fall-related SE. Perhaps general self-management of health is supported by SEMCD, Fall-related SE, and SE to manage overall health. Remaining analysis will explore the aspects of self-management identified by the participants.

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Phase 1

- quan baseline and post CDSMP data collection-first 6 months
  - Quan results-n=36 scale data collected entire 10 month period
    Manuscript 1/ ch 3

  - Principal Component Analysis, correlations, differences-analyzed after n=20 scale score

  - Initial quan results to:
    frame initial interview questions (Phase 2)

Phase 2

- QUAL 15 semi-structured interviews data collection
  - QUAL initial analysis-
    coding, memos, constant comparison
  - Quan and QUAL analyses-linked especially with interview participants

- Final interpretation-mixing quan and QUAL
  Manuscript 2/ ch4

Figure 5.1. Sequential design and analysis for Phase 1 and Phase 2 in dissertation research. quan = quantitative phase, lower priority; QUAL = qualitative phase, core method.
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program. *Stanford Patient Education Research Center:

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## APPENDIX A

### Timeline for Research

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APPENDIX B

Recruitment Materials

Letter to Regional Area Agencies on Aging for Permission to Recruit for Study

Background

This email is to introduce my dissertation research to you and to ask for your help recruiting participants from the Living Well program for this research project. As you know, the Living Well program is an evidenced based program with many positive health outcomes including being consistently associated with increased self-efficacy to manage disease. The Living Well program has content about fall management and prevention in and fall prevention programs share much of the same skills and content training with Living Well; however, no study has explored the Living Well program influence on possible relationships between self-efficacy to manage falls and self-efficacy to manage chronic disease.

This research is a mixed methods study to see if participation in the Living Well program impacts self-efficacy (SE) to prevent/manage falls and if there is a relationship between fall-related SE and SE to manage disease. To do this, I am collecting quantitative SE scale data and then doing follow up interviews with older adults.

In addition to the SE Study specific intake and follow up scale forms, the state Division of Aging Services and the Institutional Review Board at UGA have also approved my use of certain portions of information on the basic intake form used by your regional AAA as well as the attendance roll for consenting participants.

Facilities and leaders vary in their comfort level with explaining consent and administration of the pre/post forms. I am happy to attend the first session(s) to explain the study, get consent, and collect the initial data. If your leaders would rather present the study, obtain consent, and collect the data, I have also provided a leader script that can be read to introduce the study to potential participants. Leaders/organizers may want to consider building in an extra time period in the first session to accommodate explaining consent and obtaining initial data.

Data collection-Phase 1 and Phase 2

The quant phase 1 of the study does not have an age limit. The pre/post Initial Intake Form (SE Study specific) will need to be completed in addition to the regular Living Well intake form you are already collecting (if you are not planning on using an intake form for some reason, your region’s intake form has been approved for use and will need to be used to collect initial demographic information). The
Initial Intake Form (SE Study specific) may be completed in the 1st or 2nd session. The Follow Up Form (SE Study specific) will be completed on the last session. There are 3 short scales on each form. It should be completed in 5 minutes or less. I have put together folders for each participant that contain the necessary forms.

Each folder contains forms for the participants as follows:

- **Left side of folder** - for use in 1st or 2nd session
  - Consent for my SE study (two copies, one for participant to keep and one for me)
  - Initial Intake Form (SE study specific)
- **Right side of folder** - for use in final session
  - Follow Up Form (SE study specific)

The qualitative interviews in phase 2 is only those participants 65+ to better capture those with fall-related issues. It is possible for someone to agree to the phase 1 quant scale data collection on the consent but not agree to the interviews. They would just need to check phase 1 yes, phase 2 no on the consent forms. Also note, participant in the interview phase 2 process will receive $25. I will contact those participants following program completion to schedule follow up interviews.

**Final thoughts**

- Initial pre/post forms are not age specific and should be completed by all consenting participants.
- The later interviews will be focused on the older adult population (65+). The participants in the interview portion will receive $25.00 for each interview they grant.
- For those participants consenting to the phase 1 or both phases 1 and 2 in the study, they will need to:
  1. Sign consent form (both copies-one for them to keep, one for me) and check the appropriate boxes:
     - Check boxes for use of AAA intake form information
     - Consent to complete my additional pre and post SE Study Specific Form information
     - If 65 and older and want to participate in the interviews sign consent to be interviewed after they finish the program.
  2. Complete intake form for Living Well, complete pre and post SE Study Specific Forms
  3. Those agreeing to participate in the interview portion of the study (must be 65 and over) will be contacted by Kay Graham following completion of program to schedule interviews.

I will touch base with you in this week or next to see what has been scheduled and if you have any questions. My cell phone (404-234-7646) or this email (kgraham1@uga.edu) are the best ways to reach me. Please let me know if you can think of any additional concerns.

I have enclosed the forms with this email in case for some reasons you need extra copies.

Thanks again. Good luck recruiting.
APPENDIX C

Script for Lay Leader or Researcher to Recruit for Research

The following information will be read by the researcher or by program leaders before beginning the Living Well program. After reading this script, the consent forms will be passed out. Any questions regarding the study should be directed to the primary research contact: Kay Graham at 404-234-7646

The Georgia Division of Aging and this regional Area Agency on Aging have agreed to allow Living Well participants the opportunity to participate in an additional study about related types of confidence to manage health by UGA doctoral student, Kay Graham and UGA professor, Dr. Matthew Smith. This study has two parts. You can agree to participate only in the survey collection or in the survey collection and follow up interviews.

Your age, gender, disease status, race/ethnicity, and your education level will be used from your Living Well intake form as part of this study information. For this study, you will also be asked to complete a short, additional set of questions before and after the program.

If you are 65 and older, you may be asked to participate in an interview about an hour long. In this interview you will be asked questions about your confidence to manage your disease, your confidence to manage falls, and about the Living Well program’s impact on your confidence. You will receive $25.00 for each interview completed.

Participation in this study is voluntary, can be stopped at any time, and is not required for participation in the Living Well program. As part of maintaining your privacy, all participant forms and documentation used in the study will use a number system instead of names. The only master list linking your name and assigned number will be kept in a separate, locked file and destroyed within 6 months of the conclusion of this study.

If you have questions at any time, please call Kay Graham at 404-234-7646. Please take a moment to look over the consent form. Please indicate if you wish to participate in the study by signing the consent at last page of the form.
APPENDIX D

Consent Form

UNIVERSITY OF GEORGIA
CONSENT FORM
Meanings Made of Self-Efficacy:
An Exploration of Self-Management, Chronic Disease, and Fall Prevention

Researcher's Statement
I am asking you to take part in a research study. It is important that you understand why the research is being done and what it will involve. This form is designed to give you the information about the study. Then you can decide whether to be in the study or not. Please take the time to read the following information carefully. Please ask or call the researchers if there is anything that is not clear or if you need more information. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called “informed consent.” A copy of this form will be given to you.

Principal Investigator
Dr. Matthew Smith, PhD, MPH, CHES
Department of Health Promotion and Behavior
Phone: 706-542-0483 Email: health@uga.edu

Student co-investigator
Kay Graham (**key contact person for this study)
Department of Health Promotion and Behavior
Phone: 404-234-7646 Email: kgraham1@uga.edu

Purpose of the Study
You have been asked to join this study because you are in the Living Well program. The Division of Aging Services for the state of Georgia has granted permission for you to be asked to participate in this study. This study is voluntary and not required as part of the Living Well program. This study explores your confidence to manage disease and falls. You have been asked to participate because you meet the following:

- For Phase 1-written survey
  - You have participated in at least one of the first two sessions of the Living Well workshop.
  - You have at least one chronic disease such as arthritis or diabetes.
• You speak and understand English.
• For Phase 2-interviews
  • You must meet Phase 1 initial qualifications.
  • And, you must be at least 65 years old to participate in the interviews.

Study Procedures
If you agree to participate in Phase 1, you will be asked to ...
• Allow the researcher access to your Living Well initial intake form. This form is collected as a regular part of the Living Well program. Your age, gender, race/ethnicity, chronic conditions, and education level will be used from this form for this research to better understand the participants in this program.
• Complete an additional 2-page questionnaire for this study only before and just after in the Living Well workshop. Questions include one question self-rating your health, telling about any fall concerns, filling out 5 questions about confidence to prevent falls, and 6 questions about confidence to manage your disease(s).

In addition, if you are 65 or older, you will be asked to participate in Phase 2-the interview phase of the study. If you agree, you will be contacted within 1 month following the workshop and be asked to:
• Complete an initial recorded interview about 1 hour long about your confidence to manage your disease(s) and falls.
• Possibly complete follow-up interviews over the course of 6 months.

Note: Interviews will be voice recorded. The interviews will be changed into written words. All names and personal information will be changed or removed. All participants can review their interview transcripts if desired.

Risks and discomforts
• All study participation is voluntary. Participants may choose to skip any question or stop the interview at any time.
• No actual names or places will be used in the write up of data to protect confidentiality and privacy.
• No physical, legal, economic, or social risks are expected from participating in phase of the study.

Benefits
• It is hoped that being in this study will increase your understanding to manage chronic disease and falls.
• It is further hoped that your confidence to manage chronic disease and falls might improve.
• It is also hoped that it will improve programs for healthy living.

**Incentives for participation**
Those 65 and older who choose to be in Phase 2 of this study will get a $25.00 gift card for each interview.

**Audio Recording**
Interviews will be audio taped so that a written record of the interview can be made. Audio tapes will be kept in locked files for no more than 6 months. Then, the recordings will be destroyed. Transcripts from the interviews will be kept in password protected files indefinitely. All written transcripts will use changed names and places to protect privacy of participants.

Please provide initials below if you agree to have this interview recorded or not. You may still participate in this study even if you are not willing to have the interview recorded.

- _______ I do not want to have this interview recorded.
- _______ I am willing to have this interview recorded.

**Privacy/Confidentiality**
Any personal information such as name, address, and place will be changed on interview transcripts. Identifiable information will be kept on a password protected master list for 3 years. All participants have the right to access their individual data. The project’s research records may be reviewed by principal researchers and by departments at the University of Georgia responsible for research oversight. Researchers will not release identifiable results of the study to anyone other than individuals working on the project without your written consent unless required by law.

**Taking part is voluntary**
Being in the study is voluntary. You may choose not to participate or to stop at any time. If you decide to withdraw from the study, your information will be kept as part of the study and may continue to be analyzed, unless you make a written request to remove, return, or destroy the information.

**If you have questions**
The principal researcher in this study is Dr. Matthew Smith, an assistant professor at the University of Georgia. He can be contacted at 706-542-0483 or at health@uga.edu. Kay Graham, a doctoral student at the University of Georgia is the student co-investigator. Please feel free to ask any questions now. If you have any questions or concerns at a later date, please contact the student researcher, Kay Graham, at kgraham1@uga.edu or via cell 404-234-7646. You may contact the Institutional Review Board (IRB) Chairperson at 706.542.3199 or irb@uga.edu.

**Research Subject’s Consent to Participate in Research:**
To volunteer to take part in this study, you must sign on the line below. Signing below shows that you have read or had read to you this entire consent form, and have had all of your questions answered.

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<tbody>
<tr>
<td>If 65 or older, I agree to participate in the Phase 2 recorded interview process following workshop participation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>_____yes  _____no</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_________________________  ____________________________
Name of Participant  Signature  Date

_________________________  ____________________________
Name of Researcher  Signature  Date

Please sign both copies, keep one and return one to the researcher.
APPENDIX E

Sample Instruments

Instruments for Phase 1-Scale data collection

**Self-Efficacy to Manage Chronic Disease.** scored on 0-10 scale How confident are you that you can keep the: 1) fatigue caused by your disease from interfering with the things you want to do? 2) physical discomfort or pain of your disease from interfering with the things you want to do? 3) emotional distress caused by your disease from interfering with the things you want to do? 4) any other symptoms or health problems you have from interfering with the things you want to do? 5) do the different tasks and activities needed to manage your health condition so as to reduce you need to see a doctor? 6) do things other than just taking medication to reduce how much you illness affects your everyday life?

**AMOB/VLL-VLL Fall-related Self-Efficacy Scale.** Rated as: *Not sure at all, Not Very Sure, Somewhat Sure, Absolutely Sure*. Do you think you: 1) Can find a way to get up if you fall? 2) Can find a way to reduce falls? 3) Can protect yourself if you fall? 4) Can increase your physical strength? 5) Can become more steady on your feet?

Instruments for Phase 2a Data Collection-Initial Interview

**Initial questions series proposed prior to analysis**: Based on shared skills and program content, it is expected that the PCA will show overlap of SEMCD with questions 4 and 5 of the Fall-related efficacy scale.

Should PCA show scales share common overlap, questions might explore:

- How you perceive the role of exercise and increasing physical strength in relation to managing conditions?
• Follow up question-What role does fall prevention and management as a whole play in managing conditions/health?

• How does it impact disease self-management?

If the PCA shows no common loadings, initial core questions will be:

• How is managing falls different from managing your chronic condition?

• Explain a situation where confidence in managing fall would not support managing your chronic condition.

• Would you tell me a time or an example where managing falls would support health self-management? T

• his could also be reversed and asked in terms of chronic disease not falls.

Additional sample core interview questions for Initial interview phase include:

• How does the level of confidence you have in managing your own health impact you doing the things you need to do to manage your health? (SE to manage chronic disease);

• How does the level of confidence you have in your ability to prevent falls impacts you to do the things you need to do? For example, laundry, shopping, and getting out in the community. (Fall-related SE);

• How does the level of confidence you have in your ability to prevent falls impact your ability to manage your health? (SE to manage chronic disease and Fall-related SE);

• How do you see the relationship between managing chronic disease(s) relating to fall prevention? (SE to manage chronic disease and Fall-related SE).

Individual pre/post scale score response will also provide initial direction and focus for questions. Four possible types of questions have been considered and examples provided here:

If initial post scale scores both improve: I see you rated both of the scales higher at the end of the program.
• Please tell me a little bit about why you think that is so?
• How do you see the CDSMP impacting your confidence to take care of your health?
• Manage and prevent falls?
• How do the things you have learned to manage your disease help you to manage and prevent falls?
• How would learning about falls impact your capability to manage disease?

*If both post scores decrease,* questions might be:

• I see that both of your scores decreased at the end of the program. Tell me a little more about this? What do you think affected negatively your confidence?
• What types of program content might have increased your score?

*If an inverse relationship exists with SEMCD high:*

• Your scores on the scales show that your confidence to manage falls fell while your confidence to manage your condition improved following the CDSMP, how would you explain this?
• What might have better built your confidence in falls?

*For an inverse relationship with Fall-related SE high,* questions would be reverse from above.
APPENDIX F

Participant Baseline Form

Initial Living Well Participant Information
for those Agreeing to Participate in UGA Self-Efficacy Study
Principal Investigators: Dr. Matthew Smith and Kay Graham

Name:__________________________________ Contact phone: ______

Self-rated Health
In general would you say your health is: (Circle one)
Excellent………………..1
Very good………………. 2
Good…………………… 3
Fair……………………… 4
Poor…………………..... 5

Please describe any concerns you may have about fa_______________________

This next section is about the prevention and management of falls.

Confidence about managing and preventing falls: Please mark the box that tells us how sure you are that you can do the following activities.

<table>
<thead>
<tr>
<th>How sure are you that:</th>
<th>Very sure</th>
<th>Sure</th>
<th>Somewhat sure</th>
<th>Not at all sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. can find a way to get up if you fall</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. can find a way to reduce falls</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. can protect yourself if you fall</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. can increase your physical strength</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. can become more steady on your feet</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Please turn over for additional questions.
Confidence about Doing Things (Size reduced for Appendices)
Confidence for Managing Chronic Disease: For each of the following questions, please circle the number that corresponds with your confidence that you can do the tasks regularly at the present time.

How confident are you that you can...
1. Keep the fatigue caused by your disease from interfering with the things you want to do?
   Not at all confident
   0 1 2 3 4 5 6 7 8 9 10
   Completely confident

2. Keep the physical discomfort or pain of your disease from interfering with the things you want to do?
   Not at all confident
   0 1 2 3 4 5 6 7 8 9 10
   Completely confident

3. Keep the emotional distress caused by your disease from interfering with the things you want to do?
   Not at all confident
   0 1 2 3 4 5 6 7 8 9 10
   Completely confident

4. Keep any other symptoms or health problems you have from interfering with the things you want to do?
   Not at all confident
   0 1 2 3 4 5 6 7 8 9 10
   Completely confident

5. Do the different tasks and activities needed to manage your health condition so as to reduce your need to see a doctor?
   Not at all confident
   0 1 2 3 4 5 6 7 8 9 10
   Completely confident

6. Do things other than just taking medication to reduce how much your illness affects your everyday life?
   Not at all confident
   0 1 2 3 4 5 6 7 8 9 10
   Completely confident
APPENDIX G

Participant Post-Intervention Form

Follow-up Living Well Participant Information
for those Agreeing to Participate in UGA Self-Efficacy Study
Principal Investigators: Dr. Matthew Smith and Kay Graham

Name_____________________ Number of sessions attended:____

Contact phone:_______________________

Please indicate any changes to your health status since beginning the Living Well Workshop (illnesses, fall__________________________

Self-rated Health
In general would you say your health is: (Circle one)

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Very good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

This next section is about the prevention and management of falls.

**Confidence about managing and preventing falls:** Please mark the box that tells us how sure you are that you can do the following activities.

<table>
<thead>
<tr>
<th>How sure are you that:</th>
<th>Very sure</th>
<th>Sure</th>
<th>Somewhat sure</th>
<th>Not at all sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. can find a way to get up if you fall</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. can find a way to reduce falls</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. can protect yourself if you fall</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. can increase your physical strength</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. can become more steady on your feet</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Please turn over for additional questions.
Confidence about Doing Things

Confidence for Managing Chronic Disease: For each of the following questions, please circle the number that corresponds with your confidence that you can do the tasks regularly at the present time.

How conmanagementent are you that you can...

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all confident</th>
<th>Completely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Keep the fatigue caused by your disease from interfering with the things you want to do?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>2. Keep the physical discomfort or pain of your disease from interfering with the things you want to do?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>3. Keep the emotional distress caused by your disease from interfering with the things you want to do?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>4. Keep any other symptoms or health problems you have from interfering with the things you want to do?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>5. Do the different tasks and activities needed to manage your health condition so as to reduce your need to see a doctor?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>6. Do things other than just taking medication to reduce how much your illness affects your everyday life?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX H

Script for Scale Collection Via Phone

Phone Call Interview Script

Hello __________________

My name is Kay Graham. You recently finished the Living Well workshop. You may recall you completing some additional questions about managing diseases and falls to help with a research project I am doing. Part of that project also collects the same information at the end of the program. Do you have about five minutes to answer a few questions? Is this a good time to talk?

You can choose to not answer any question or end participation at any time. Your name will not be linked to your answers. Do you have questions before we begin?

These questions may sound familiar because you answered them during the program. (From here, begin reading the post data collectithe participant).

Following the information collected:

Thank you for your time.

If over 65 and agreed to participate in interview:

When you first agreed to participate, you also said that you would be interested in participating in at least 1 interview. For your time in the interview, you will be paid $25.00. Would you still be interested in doing this?

If yes:

- Could we meet at the facility (senior center, etc)? or would you prefer meeting by phone?
- What would be a good day for you?, Time of day?
- Is this a good contact number for you?

If no:

- Ok. Thank you for your time.
APPENDIX I

Updated Interview Guide Following Preliminary Scale Data Collection

Interview Guide for Kay Graham as if 08/2015

Hello, my name is Kay Graham. I am a doctoral student in the Department of Health Promotion and Behavior at the University of Georgia. I am interested in finding more about how people think about managing chronic disease and preventing falls. I am interviewing people who have completed the Living Well program.

Thank you very much for agreeing to share your experiences with me. It is my hope that this interview will help increase general understanding of how attending the Living Well program changes confidence to manage health and falls.

As we discussed when you initially agreed to participate in this study, you can stop the interview or refuse to answer questions at any time. All information will be specially coded to protect the confidentiality of your personal information. And, any personal information such as name, address, and place will be replaced with a pseudonym on the interview transcripts and analysis. You also will have the right to access your interview transcripts at any time in the research process. All personal information collected will be kept in locked file drawer and destroyed at the end of the study.

This interview should take no more than an hour. As mentioned before, this interview seeks to understand how you think about and experience self-management of health. Please feel free to ask clarification questions at any time. So, before we get started, do you have any questions or things that need to be clarified?

Transition: Before we move into the interview questions, I just want to review the survey questions you completed about your health: (Here, I will review the initial survey concerning any chronic conditions, falls, problems noted in terms of):

- General health status
- Physical and general activity status
- How has your health affected what you can do in the home? In your community?
- Sometimes giving examples of personal experiences can help ensure I understand what you are saying. Tell me about a time when you adjusted what you planned to do because of your health.
• How does the level of confidence you have in managing your own health impact you doing the things you need to do to manage your health?
  o Things that might impact doing what you want or need to do:
    ▪ Fatigue
    ▪ Pain,
    ▪ Emotional Distress
  o Examples of tasks that might be difficult:
    ▪ Eating right
    ▪ Taking medication
    ▪ Exercising

• Prompts further for this question can come from the Chronic Disease Self-Management Scale questions as follows:

  1. How confident are you that you can keep the fatigue caused by your disease from interfering with the things you want to do?
  
  2. How confident are you that you can keep the physical discomfort or pain of your disease from interfering with the things you want to do?
  
  3. How confident are you that you can keep the emotional distress caused by your disease from interfering with the things you want to do?
  
  4. How confident are you that you can keep any other symptoms or health problems you have from interfering with the things you want to do?
  
  5. How confident are you that you can do the different tasks and activities needed to manage your health condition so as to reduce you need to see a doctor?

Transition: Now that you have told me a little bit about yourself and your health, I would like to find out some things about how you manage your health.

Research questions: How does self-efficacy to manage one’s disease process relate to fall-related self-efficacy?

• Please tell me about a time that you felt confident that you could self-manage your disease process.
• As a follow up to that question, what do you think gave you the confidence that you could manage your disease?
• Please tell me about a time that you lacked confidence that you could self-manage your disease process.
• As a follow up to that question, what do you think led you to think that you could not manage your disease?
Since the PCA shows scales share common overlap both in terms of double loading as well as loading within same component both on pre and post, questions for all participants might explore:

In regards to managing conditions impacting falls:
- How does managing your condition(s) impact your ability to manage and prevent falls?
- How does your confidence level to manage your condition influence your confidence to manage falls?

In regard to managing falls impacting conditions:
- What role does fall prevention and management as a whole play in managing conditions/health?
- How does fall prevention impact disease self-management?
- How you perceive the role of exercise and increasing physical strength in relation to managing conditions? Managing falls?

How is managing falls different from managing your chronic condition?
- Explain a situation where confidence in managing fall would not support managing your chronic condition.
- Would you tell me a time or an example where managing falls would support health self-management? (This could also be reversed and asked in terms of chronic disease not falls).

Transition: Now that you have told me about how you manage your health, I am interested in how your understanding and confidence changed following the Living Well workshop.

Research question: How do older adult participants in self-management health programs understand self-efficacy to manage their health?

- How do you think the Living Well program has impacted your confidence to take care of your health? Manage and prevent falls?
- What parts of the program helped to build confidence to manage health? Falls?
- What parts of the program decreased confidence to manage health? Falls?
- How do you think participation in the Living Well program specifically impacted your confidence in your ability to reduce falls and in your ability to get up from a fall?
- What types of things around managing your condition might you do to help you be able to reduce falls?
- How has this Living Well program changed your thinking about
  - 1) managing your condition(s) and
  - 2) about managing and preventing falls?
- How has this Living Well program changed your expectations about
  - 1) managing your condition(s) and
  - 2) about managing and preventing falls?
How has this Living Well program changed your confidence about
- 1) managing your condition(s) and
- 2) about managing and preventing falls?

Based on the PCA and correlation information, the following questions will address specific topics that have emerged:
- How did the Living Well program address factors such as fatigue caused by your condition?
- What might help increase confidence to keep fatigue from limiting what you want and need to do?

Research question: How does participation in a self-management training program impact perceptions of self-efficacy to manage disease? and to prevent falls?

Individual pre/post scale score response will also provide initial direction and focus for questions. Four possible types of questions have been considered and examples provided here:
- If initial post individual scale scores both improve:
  - I see you rated both of the scales higher at the end of the program. Please tell me a little bit about why you think that is so?
  - How do the things you have learned to manage your disease help you to manage and prevent falls? How would learning about falls impact your capability to manage disease?
- If both post individual scores decrease, questions might be:
  - I see that both of your scores decreased at the end of the program. Tell me a little more about this.
  - What do you think affected negatively your confidence?
  - What additional types of program content might have increased your confidence?
APPENDIX J

Supplemental Scale Collected but Utilized

Self-Rated Health. This single item scale is commonly used by national health surveys (Hays, Spritzer, Thompson, & Cella, 2015) and is recommended for use by CDSMP researchers (Lorig & Laurent, 2007). It asks persons to rate health from Excellent (1) to Poor (5): In general, would you say your health is... (circle one number). While this scale is correlated with longer physical health scale and can be used for individual assessment of health, it has lower marginal/average reliability than the four question scale (0.52).

References


APPENDIX K
Recruitment of CDSMP Workshops

Permission obtained from state Division of Aging Services to contact 2 AAA regions 1/14

Permission granted by IRB 1/15

19 courses were scheduled for timeframe from February 2015-October 2015 in initial 2 regions

Both wellness coordinators in the designated 2 regions as well as all leaders and course hosting sites granted permission for data collection

Course times and locations determined from Wellness coordinators in 2 regions and state Living Well website

8 courses made

11 courses cancelled either before or after attempted start

4/15 Granted permission from state Division of Aging Services and IRB to extend data collection to state due to low number of courses making/becoming held in original 2 regions

Wellness coordinators in 2 additional regions agreed to allow consent of Living Well leaders and hosting sites to ask permission

1 contacted coordinator never responded

1 course in additional region participated in research

1 course in separate region cancelled before start

3 courses refused participation at the local level
**APPENDIX L**

**Table L.1 Addendum to Table 3.4**

Addendum to Table 3.4. Correlations Pearson’s and Spearman’s for SEMCD Scale and FallE Scale at baseline and post-intervention in CDSMP Workshop (N=36)

<table>
<thead>
<tr>
<th></th>
<th>Pearson’s r</th>
<th>Spearman’s rho</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>P</td>
</tr>
<tr>
<td>Baseline SEMCD and post SEMCD Scale</td>
<td>.57***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Baseline SEMCD and baseline FallE Scale</td>
<td>.61***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Baseline SEMCD and post FallE Scale</td>
<td>.69***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Post SEMCD and baseline FallE Scale</td>
<td>.33*</td>
<td>.049</td>
</tr>
<tr>
<td>Post SEMCD and post FallE Scale</td>
<td>.52**</td>
<td>.001</td>
</tr>
<tr>
<td>Baseline FallE Scale and post FallE Scale</td>
<td>.74***</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

2-tailed significance *P<0.05, **P<0.01, ***P<0.001
APPENDIX M

CDSMP Session Content

The most current content for CDSMP program can be found in the standardized, copyrighted program manual developed by Lorig et al. (2012). Content by session includes:

Session 1-intro, mind-body, sleep, action plans;

Session 2-feedback and problem solving, dealing with emotions, activity and exercise, fall prevention, improving balance, making action plans;

Session 3-making decisions, managing pain and fatigue, exercise-endurance, relaxation, action plan;

Session 4-breathing, eating, communication, problem solving, action plan;

Session 5-food choices, medication, informed decisions, depression, positive thinking, action plan;

Session 6-working with health care professions, weight, reflection and planning.

## APPENDIX N

### Table N.1 Comparison between CDSMP and AMOB/VLL

<table>
<thead>
<tr>
<th>AMOB/VLL</th>
<th>CDSMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>General program description</td>
<td>“cognitive-behavioral intervention program was designed to reduce fear of falling by increasing self-efficacy and the sense of control over falling” (Tennstedt et al., 1998, p. 385)</td>
</tr>
<tr>
<td>Intervention objective overall</td>
<td>“To promote activity (functional, physical, social) by reducing fear of falling” (Tennstedt et al., 1998, p. 385)</td>
</tr>
<tr>
<td>Primary aim</td>
<td>Decrease fear of falling</td>
</tr>
<tr>
<td></td>
<td>• Increase healthy behaviors (exercise, cognitive symptom management like relaxation)</td>
</tr>
<tr>
<td></td>
<td>• Improved health status (less pain, fatigue, worry)</td>
</tr>
<tr>
<td></td>
<td>• Increased Self-efficacy</td>
</tr>
<tr>
<td></td>
<td>• Improved communication with healthcare providers</td>
</tr>
<tr>
<td></td>
<td>• Fewer visits to MD and ER</td>
</tr>
<tr>
<td>Secondary aim</td>
<td>Increase activity (functional, physical, social)</td>
</tr>
<tr>
<td>Session structure</td>
<td>8, 2 hour sessions, 2x/week for 4 weeks</td>
</tr>
<tr>
<td></td>
<td>6, 2.5 hour sessions, 1x/week for 6 weeks</td>
</tr>
</tbody>
</table>

Comparison between CDSMP and AMOB/VLL

Table N.1.
<table>
<thead>
<tr>
<th>AMOB/VLL</th>
<th>CDSMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Tennstedt et al., 1998, Smith, Ory, Belza, &amp; Altpeter, 2012)</td>
<td>(Lorig et al., 1999, 2001; Schneider, n.d.)</td>
</tr>
<tr>
<td><strong>Targeted Pop</strong></td>
<td>Adults with chronic conditions (and caregivers)</td>
</tr>
<tr>
<td>60+, can problem solve</td>
<td>Based on self-efficacy—that confidence that can do a new skill (such as make changes to health)</td>
</tr>
<tr>
<td>Concerned about falls, interested in improving flexibility, balance, strength</td>
<td>3 assumptions (Lorig et al., 1999, p. 6):</td>
</tr>
<tr>
<td></td>
<td>• Similar self-management problems and disease-related tasks even with different disease</td>
</tr>
<tr>
<td></td>
<td>• Can learn to be responsible for daily self-management of conditions</td>
</tr>
<tr>
<td></td>
<td>• When have SE and knowledge, health behaviors, status, and services use will improve</td>
</tr>
<tr>
<td><strong>Intervention theory</strong></td>
<td>Use of lay leaders as role models-similar will increase SE to manage disease</td>
</tr>
<tr>
<td>Interventions early in program work to change attitude and increase self-efficacy BEFORE try to change behavior- Cognitive restructuring:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>From Stanford Self-Management Program Fidelity Manual –November 2012:</td>
</tr>
<tr>
<td></td>
<td>• People want control in life and with information and support can make choices (self-tailor)</td>
</tr>
<tr>
<td></td>
<td>• Before can have behavior change, need confidence that can make the change. Programs build SE and small, imperfect gains work</td>
</tr>
<tr>
<td></td>
<td>From (Schneider)NCOA: <strong>Process not the subject is most important</strong></td>
</tr>
<tr>
<td><strong>Format</strong></td>
<td>Small group format-10-16</td>
</tr>
<tr>
<td>Group10-12 (minimum 8, max 14)</td>
<td>New online version</td>
</tr>
<tr>
<td>Peer led, visit with health professional</td>
<td>Peer led –request at least 1 peer</td>
</tr>
<tr>
<td>Manual and videos, no specific script</td>
<td>Manualized, scripted</td>
</tr>
<tr>
<td></td>
<td>Companion book for participants</td>
</tr>
<tr>
<td><strong>Content/Interventions</strong></td>
<td><strong>Coping strategies to deal with all diseases</strong></td>
</tr>
<tr>
<td>• Instill adaptive belief-perceived control, confidence in abilities, more realistic assess of behavior</td>
<td>o Action planning and feedback</td>
</tr>
<tr>
<td>• Educate at self-conceptualizations of falls, risk</td>
<td>o Behavior modeling</td>
</tr>
<tr>
<td>• Promote more realistic view</td>
<td>o Problem-solving techniques</td>
</tr>
<tr>
<td>• Video fears/vs positive attitude falling</td>
<td>o Decision making</td>
</tr>
<tr>
<td>• Later content-promote adaptive conception of FOF-train in shift from maladaptive to adaptive cognitions or self-defeat to motivating</td>
<td><strong>Control symptoms via:</strong></td>
</tr>
<tr>
<td></td>
<td>o Relaxation</td>
</tr>
<tr>
<td></td>
<td>o Healthy eating</td>
</tr>
</tbody>
</table>
Reinforce with teaching materials—incidence, risk, skill train prevent falls, action if do fall, benefits of ex, risk of inactivity
- 30 minutes strength activity with bands-to use at home too (6 of 8 sessions)
- Assertive techniques-hc provider/family about falls
- Behavioral contracts/goal setting 

**2012 addition of short fall prevention/balance section (Lorig, Gonzalez, & Laurent, 2012)**

Outcome measures

Fall Efficacy Scale (originally Fall Management Scale, Tennedst, 1998;)

Health behaviors
Health status
Health service utilization
SE—Self-Efficacy to Manage Chronic Conditions

Final thoughts

NOT designed to decrease falls—decreases activity restriction and deconditioning—perhaps reduce risk falls

New focus with National Study (Ory, et al., 2013):
Better health *did not use SE as measure BUT focus on HEALTH
Better healthcare
Better value

References


APPENDIX O

Interview Participants' Direction of Differences Post Minus Baseline

Table O.1.

Interview Participants’ Direction of Differences Post Minus Baseline

<table>
<thead>
<tr>
<th>Participant</th>
<th>Difference</th>
<th>Mean SEMCD Scale</th>
<th>Summed Fall E Scale</th>
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Note. Difference = Post scale score minus baseline